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THE

AMERICAN EPHEMERIS

AND

NAUTICAL ALMANAC

FOR THE YEAR

1915

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PREFACE.

The character of the matter contained in this issue of the American Ephemeris and Nautical Almanac, and its arrangement, are the same as in the preceding volume, that for the year 1914.

The volume is divided into three parts, as follows:

Part I, *Ephemeris for the Meridian of Greenwich*, which gives the ephemerides of the Sun and Moon, the geocentric and heliocentric positions of the major planets, the Sun's coordinates, and other fundamental astronomical data for equidistant intervals of Greenwich mean time.

Part II, *Ephemeris for the Meridian of Washington*, which gives ephemerides of the fixed stars, Sun, Moon, and major planets for transit over the meridian of the Naval Observatory, Washington, which passes midway between the West and East Transit Circles of the Observatory. The mean places of the fixed stars and the data for their reduction are also included in this part.

Part III, *Phenomena*, which contains predictions of phenomena to be observed, with data for their computation. Washington mean time for the meridian of the Naval Observatory is used throughout this part except in a few cases, notably those of eclipses, where Greenwich mean time seems more convenient. Tables for the determination of latitude and azimuth from Polaris, tables for the conversion of time, and an alphabetical list of observatories with their latitudes. longitudes, and other data, are contained in this part.

W. S. EICHELBERGER,
Professor of Mathematics, U. S. Navy,
Director Nautical Almanac.

WASHINGTON, *August, 1912.*

ERRATA.

The American Ephemeris, 1912.

Page.					
240,	Footnote, δ^2 Cham.	*for*	256″ s.	*read*	256″ n.
247,	Footnote, *o* Cygni	*for*	f. $1'$	*read*	f. 1^s
560,	Second eclipse, Moon's declination .	*for*	11 0 47.9 N.	*read*	11 0 53.1 N.
636,	Synodic Period, Satellite IX . . .	*for*	580 4.7	*read*	523 15.6
650,	Bogota, Red. to Geoc. Lat.	*for*	−11 51.5	*read*	−1 51.5
654,	Lawrence, Geographic Latitude . .	*for*	+36°	*read*	+38°
657,	San Fernando, Long. from Greenwich	*for*	+6 27 18.0	*read*	+6 12 18.0

For other errata, 1912, see page iv of *The American Ephemeris*, 1913 and 1914.

The American Ephemeris, 1913.

240,	Footnote, δ^2 Cham.	*for*	256″ s.	*read*	256″ n.
247,	Footnote, *o* Cygni	*for*	f. $1'$	*read*	f. 1^s
572,	Second star	*for*	*v* Geminorum	*read*	υ Geminorum
	Tenth star	*for*	v^1 Cancri	*read*	υ^1 Cancri
	Eleventh star	*for*	v^2 Cancri	*read*	υ^2 Cancri
657,	Synodic Period, Satellite IX . . .	*for*	580 2.9	*read*	523 15.6
670,	Bogota, Red. to Geoc. Lat.	*for*	−11 51.5	*read*	−1 51.5
674,	Lawrence, Kans., Geographic Lat. .	*for*	+36°	*read*	+38°
677,	San Fernando, Long. from Greenwich	*for*	+6 27 18.0	*read*	+6 12 18.0

For other errata, 1913, see page iv of *The American Ephemeris, 1914.*

The American Ephemeris, 1914.

137,	Dec. 32, Upper Transit, Diff. for 1 Hr.	*for*	2.20	*read*	2.21
240,	Footnote, δ^2 Cham.	*for*	256″ s.	*read*	256″ n.
247,	Footnote, *o* Cygni	*for*	f. $1'$	*read*	f. 1^s
526,	Jan. 21 U, Bright Limbs	*for*	N.	*read*	N.
549,	Dec. 31, Apparent Declination . .	*for*	47.4	*read*	47.5
558,	Dec. 32, Apparent Declination . .	*for*	2.3	*read*	2.4
657,	Synodic Period, Satellite IX . . .	*for*	580 2.9	*read*	523 15.6
669,	Dec. 23 12 −	*for*	⛢	*read*	♂
670,	Bogota, Red. to Geoc. Lat.	*for*	−11 51.5	*read*	−1 51.5
674,	Lawrence, Kans., Geographic Lat. .	*for*	+36°	*read*	+38°
677,	San Fernando, Long. from Greenwich	*for*	+6 27 18.0	*read*	+6 12 18.0

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ANNIVERSARIES AND FESTIVALS, 1915.

New Year's Day	Friday,	Jan.	1.
Epiphany	Wednesday,	Jan.	6.
Septuagesima Sunday	Sunday,	Jan.	31.
Lincoln's Birthday	Friday,	Feb.	12.
Quinquagesima (Shrove Sunday)	Sunday,	Feb.	14.
Ash Wednesday	Wednesday,	Feb.	17.
Washington's Birthday	Monday,	Feb.	22.
Palm Sunday	Sunday,	Mar.	28.
First Day of Passover	Tuesday,	Mar.	30.
Good Friday	Friday,	Apr.	2.
Easter Sunday	Sunday,	Apr.	4.
Rogation Sunday	Sunday,	May	9.
Ascension Day (Holy Thursday)	Thursday,	May	13.
Hebrew Pentecost (Shebuoth)	Wednesday,	May	19.
Pentecost (Whit Sunday)	Sunday,	May	23.
Memorial Day	Sunday,	May	30.
Trinity Sunday	Sunday,	May	30.
Corpus Christi	Thursday,	June	3.
Independence Day	Sunday,	July	4.
Labor Day (except in certain States)	Monday,	Sept.	6.
Day of Atonement (Yom Kippur)	Saturday,	Sept.	18.
First Day of Tabernacle (Sucoth)	Thursday,	Sept.	23.
Election Day (in some States)	Tuesday,	Nov.	2.
Thanksgiving Day	Thursday,	Nov.	25.
First Sunday in Advent	Sunday,	Nov.	28.
Christmas Day	Saturday,	Dec.	25.

INTRODUCTION.

The Ephemeris for the Meridian of Greenwich, comprising Part I of this volume, has been constructed from various tables of the Sun, Moon, and planets, as stated below, and the ephemerides of these bodies for the meridian of Washington contained in Part II have been computed from the same tables.

The Ephemeris of the Sun is constructed from Newcomb's *Tables of the Sun, Astronomical Papers of the American Ephemeris*, Vol. VI, part 1.

The adopted value of the mean equatorial horizontal parallax of the Sun is $8''.80$, *Paris Conference, May, 1896*.

The Sun's rectangular equatorial coordinates are computed from the longitudes and latitudes by the following formulæ:

$$\begin{aligned} X &= R \cos \lambda \\ Y &= R \sin \lambda \cos \omega - 19.3\, R\, \beta \\ Z &= R \sin \lambda \sin \omega + 44.5\, R\, \beta \end{aligned}$$

The reductions to mean equinox are computed by the formulæ—

$$\begin{aligned} \Delta X &= +Y \sec \omega\, \Delta\lambda \sin 1'' \\ \Delta Y &= -X \cos \omega\, \Delta\lambda \sin 1'' + Z\Delta\omega \sin 1'' + 9.1\, \tau R \sin (\lambda + 6^\circ) \\ \Delta Z &= -X \sin \omega\, \Delta\lambda \sin 1'' - Y\Delta\omega \sin 1'' - 21.0\, \tau R \sin (\lambda + 6^\circ) \end{aligned}$$

where the numerical coefficients are in units of the seventh place of decimals and

R=the Sun's radius vector,
λ=the Sun's true longitude,
β=the Sun's true latitude, expressed in seconds of arc,
ω=the obliquity of the ecliptic,
$\Delta\lambda$=the reduction of longitude for precession and nutation from the beginning of the Besselian fictitious year,
$\Delta\omega$=the reduction of the mean to the apparent obliquity,
τ=the fraction of the year since the beginnning of the Besselian fictitious year.

The longitude, latitude, and parallax of the Moon are derived from Hansen's *Tables de la Lune* (London, 1857), the mean longitude being corrected as in previous years, beginning with the volume for the year 1883. The statement concerning these corrections which is contained in the volumes from 1883 to 1911, inclusive, is erroneous, in that they have not been computed strictly in accordance with the formula in Newcomb's *Researches on the Motion of the Moon*, part 1, page 268, *Washington Observations*, 1875, Appendix II. That formula is,

$$-1''.14 - 29''.17\ \mathrm{T} - 3''.86\ \mathrm{T}^2 - \mathrm{V}_2 - 0''.09 \sin \mathrm{A} - 15''.49 \cos \mathrm{A},$$

while the expression actually used is,

$$-1''.14 - 29''.17\ \mathrm{T} - 3''.76\ \mathrm{T}^2 - \mathrm{V}_2 - 15''.49 \cos \mathrm{A}.$$

In these formulæ T is the time in units of 100 years reckoned from 1800.

The ephemerides of Mercury, Venus, and Mars are derived from Newcomb's tables of these planets, *Astronomical Papers of the American Ephemeris*, Vol. VI, parts 2, 3, and 4.

The ephemerides of Jupiter and Saturn are derived from the tables constructed in this office by George W. Hill, *Astronomical Papers of the American Ephemeris*, Vol. VII, parts 1 and 2.

The ephemerides of Uranus and Neptune are derived from Newcomb's tables of these planets, *Astronomical Papers of the American Ephemeris*, Vol. VII, parts 3 and 4.

The nutation used in computing the ephemerides of the Sun, Moon, and planets has been taken from Tables XXXII and XXXIII of Newcomb's Tables of the Sun, *Astronomical Papers of the American Ephemeris*, Vol. VI, part 1, and is given at intervals of five days on page 214. The formulæ from which the nutation is computed are as follows, the time interval T being expressed in units of 100 years, reckoned from 1900. See *Tables of the Sun*, page 26.

$$\begin{aligned}\delta\psi = -&(17''.234+0''.017\,T)\sin\text{☊}\\ +&\;0''.209\sin 2\,\text{☊}\\ -&\;1''.257\sin 2\,L\\ -&\;0''.049\sin(3\,L+78^\circ.7)\\ +&\;0''.110\sin(L+75^\circ.3)\end{aligned}$$

$$\begin{aligned}\delta\varepsilon = &+9''.214\cos\text{☊}\\ &-0''.090\cos 2\,\text{☊}\\ &+0''.546\cos 2\,L\\ &+0''.021\cos(3\,L+78^\circ.7)\\ &-0''.009\cos(L-78^\circ.7)\end{aligned}$$

The formulæ for the nutation used in computing the Besselian and Independent Star Numbers, pages 218–229, are as follows:

Terms of Long Period.

$$\begin{aligned}\delta\psi = -&(17''.234+0''.017\,T)\sin\text{☊}\\ +&\;0''.209\sin 2\,\text{☊}\\ -&\;1''.272\sin 2\,L\\ +&\;0''.126\sin(L-\Gamma)\\ -&\;0''.050\sin(3\,L-\Gamma)\\ +&\;0''.021\sin(L+\Gamma)\\ +&\;0''.012\sin(2\,L-\text{☊})\\ \delta\varepsilon = +&\;(9''.210+0''.0009\,T)\cos\text{☊}\\ -&\;0''.090\cos 2\,\text{☊}\\ +&\;0''.552\cos 2\,L\\ +&\;0''.022\cos(3\,L-\Gamma)\\ -&\;0''.009\cos(L+\Gamma)\\ -&\;0''.007\cos(2\,L-\text{☊})\end{aligned}$$

Terms of Short Period.

$$\begin{aligned}&-0''.204\sin 2\,\text{☾}\\ &+0''.011\sin(\text{☾}+\Gamma')\\ &+0''.068\sin(\text{☾}-\Gamma')\\ &-0''.034\sin(2\,\text{☾}-\text{☊})\\ &-0''.026\sin(3\,\text{☾}-\Gamma')\\ &+0''.015\sin(\text{☾}-2\,L+\Gamma')\\ &+0''.006\sin 2\,(\text{☾}-L)\\ &+0''.088\cos 2\,\text{☾}\\ &+0''.018\cos(2\,\text{☾}-\text{☊})\\ &+0''.011\cos(3\,\text{☾}-\Gamma')\\ &-0''.005\cos(\text{☾}+\Gamma')\end{aligned}$$

The meaning of the symbols used and the manner in which these latter formulæ have been employed in computing the ephemerides of the stars, pages 251 to 510, are explained on pages 216 and 217. The slight discrepancy between the terms in 2 L in these two sets of formulæ is due to the correction of an error in the first set. See *Bulletin Astronomique*, 1898, Vol. XV, page 244.

The list of 825 stars contained in Part II has been selected from Newcomb's Catalogue of Fundamental Stars, *Astronomical Papers of the American Ephemeris*, Vol. VIII, part 2. The mean places and annual variations of the stars have been taken from Newcomb's Catalogue, except that those of ε Hydri, 38 Horologii (G.), and π Centauri have been taken from *Veroeffentlichungen des Koeniglichen Astronomischen Rechen-Instituts zu Berlin*, 1907, No. 33.

The relative accuracy with which the places of the stars are determined in both right ascension and declination may be estimated approximately from the mean errors for the year 1920, given on pages 511–517, and taken from *Astronomical Papers of the American Ephemeris*, Vol. VIII, part 2, pages 370–382.

The constants of aberration, precession, nutation, and obliquity of the ecliptic, used in the reduction of stars to apparent place, are given on pages 213 and 214, and the formulæ for the computation of the Besselian and Independent Star Numbers are given on page 216, the coefficients being those given by Newcomb in *Bulletin Astronomique*, 1898, Vol. XV, page 241.

The terms of short period of the nutation depending on the Moon's mean longitude are tabulated for Washington mean midnight of each day on pages 231–232, and have been computed from the formulæ for these terms given above.

The method by which the right ascensions and declinations of the stars interpolated from the 10-day ephemerides (pp. 287–486) are corrected for the effect of these short-period terms is given on page 217.

According to the formulæ on pages 216 and 217 the star constants a, b, c, d, a', b', c', d' are computed for each star from its mean place at the beginning of the year, but if strict accuracy is required they should be computed from the star's mean place at date, and the following second-order terms should be added to the usual expressions for the reduction from mean to apparent place, namely—

To $\alpha-\alpha_0$

$$
\left.\begin{array}{l}
+\overset{\mathrm{s}}{0}.000\,003\;r^2\sin\alpha \\
-0.000\,149\;r^2\cos\alpha
\end{array}\right\}\tan\delta
$$

$$
\left.\begin{array}{l}
-0.000\,0650\;r^2\sin 2\alpha \\
+0.000\,0103\sin 2\,\text{☊}\,\cos 2\alpha \\
-0.000\,0107\cos 2\,\text{☊}\,\sin 2\alpha
\end{array}\right\}\tan^2\delta
$$

$$
\left.\begin{array}{l}
+0.000\,0620\sin 2\odot\cos 2\alpha \\
-0.000\,0622\cos 2\odot\sin 2\alpha
\end{array}\right\}\sec^2\delta
$$

$$
\left.\begin{array}{l}
+0.000\,0513\sin(\odot+\text{☊})\cos 2\alpha \\
-0.000\,0507\cos(\odot+\text{☊})\sin 2\alpha \\
+0.000\,0097\sin(\odot-\text{☊})\cos 2\alpha \\
-0.000\,0053\cos(\odot-\text{☊})\sin 2\alpha
\end{array}\right\}\tan\delta\sec\delta
$$

To $\delta-\delta_0$

$$
\left.\begin{array}{l}
+\overset{\prime\prime}{0}.000\,975\;r^2\sin^2\alpha \\
-0.000\,023\cos 2\,\text{☊} \\
-0.000\,080\cos 2\,\text{☊}\,\cos 2\alpha \\
-0.000\,077\sin 2\,\text{☊}\,\sin 2\alpha \\
+0.000\,040\cos 2\odot \\
-0.000\,467\cos 2\odot\cos 2\alpha \\
-0.000\,465\sin 2\odot\sin 2\alpha
\end{array}\right\}\tan\delta
$$

$$
\left.\begin{array}{l}
-0.000\,039\cos(\odot+\text{☊}) \\
-0.000\,380\cos(\odot+\text{☊})\cos 2\alpha \\
-0.000\,385\sin(\odot+\text{☊})\sin 2\alpha \\
-0.000\,380\cos(\odot-\text{☊}) \\
-0.000\,040\cos(\odot-\text{☊})\cos 2\alpha \\
-0.000\,072\sin(\odot-\text{☊})\sin 2\alpha
\end{array}\right\}\sin\delta\tan\delta
$$

These terms are negligible for stars whose declination is numerically less than 80°, but in computing the apparent places given in the American Ephemeris they have been applied whenever sensible.

The *apparent* places of α Canis Majoris (Sirius), α Canis Minoris (Procyon), α^2 Centauri, and 61 Cygni, have been corrected for the effect of annual parallax, the adopted constants of parallax being $0''.38$, $0''.27$, $0''.75$, and $0''.40$, respectively.

The *apparent* places of α Canis Majoris (Sirius), α Canis Minoris (Procyon), and α^2 Centauri, have been corrected for the effect of orbital motion. AUWERS's elements were used for Sirius and Procyon, and SEE's elements for α^2 Centauri. The values of these corrections are given on pages 98 and 99 of *Veroeffentlichungen des Koeniglichen Astronomischen Rechen-Instituts zu Berlin*, 1907, No. 33, but those for Sirius and Procyon need an additional correction to refer them to the center of the orbit before they are applicable to the mean places taken from NEWCOMB'S Fundamental Catalogue. These additional corrections for Sirius and Procyon were omitted in the Star List [Supplement to the American Ephemeris and Nautical Almanac] for 1910 and 1911, and in the American Ephemeris and Nautical Almanac for 1912 and 1913. The values of the corrections for the three stars are—

	Sirius.		Procyon.		α^2 Centauri.	
	1915.0	1916.0	1915.0	1916.0	1915.0	1916.0
$\Delta\alpha$	$-0^{\mathrm{s}}.140$	$-0^{\mathrm{s}}.142$	$-0^{\mathrm{s}}.061$	$-0^{\mathrm{s}}.062$	$+0^{\mathrm{s}}.669$	$+0^{\mathrm{s}}.658$
$\Delta\delta$	$-0''.32$	$-0''.46$	$-0''.20$	$-0''.08$	$+6''.51$	$+6''.25$

The values of $\Delta\alpha$ and $\Delta\delta$ which are given for the companions to the stars γ Andromedæ, ζ Ursæ Majoris and 61 Cygni, have been taken from the Greenwich 10-year catalogue for 1890, those for α Crucis from the Cape Catalogue for 1900, and those for α^2 Geminorum from DOBERCK's elements given in the *Astronomische Nachrichten*, 1904, Vol. 166, page 145.

The magnitudes of the stars have, with a few exceptions, been taken from *Annals of the Harvard College Observatory*, Vol. L, 1908.

In general, the names of the stars are the same as in Newcomb's Suggested List of Fundamental Stars, except that the Flamsteed number has been omitted in all cases where Greek or italic letters are available. In some cases the constellation and number of the uranometries of Heis or Gould have been used. In all such cases, Heis or the letter G in parentheses follows the constellation name, as, for example, 5 Cassiopeiæ (Heis) and 38 Horologii (G.).

The stars occulted by the Moon, pages 565–569, have been selected from the catalogue of zodiacal stars contained in Vol. VIII, part 3, *Astronomical Papers of the American Ephemeris*, and the mean places for 1915.0 have been derived from the same catalogue.

In Part III the elements of eclipses of the Sun and occultations of stars by the Moon are given in accordance with Bessel's method, the special forms employed being a modification of those developed in Chauvenet's *Spherical and Practical Astronomy*.

In the computation of the elements of Eclipses, the following corrections to the longitude, latitude, and parallax of the Moon, deduced by Newcomb from recent observations of occultations of stars by the Moon, have been applied. These corrections have been assumed in each case to be constant during the eclipse.

G. M. T.	δv	δb	$\delta \pi$
1915.	$''$	$''$	$''$
Feb. 13^d 16^h	+6.6	−0.4	+0.4
Aug. 10 11	+8.8	+0.4	+0.4

The satellites of Mars are computed from manuscript tables based upon elements deduced by Walter S. Harshman.

The eclipses of Jupiter's satellites are computed from a *Continuation of* Damoiseau's *Tables*. The occultations, transits, etc., are computed from Woolhouse's tables, given in the *British Nautical Almanac* for 1835; Table II of each satellite having been adapted to Damoiseau's tables.

The Vth satellite of Jupiter is computed from manuscript tables based upon unpublished elements deduced from the observations of Barnard.

The differential coordinates of Jupiter's VIth and VIIth satellites have been computed from elements and tables given in *Lick Observatory Bulletin*, 1906, Vol. IV, No. 112, and in *Astronomische Nachrichten*, 1907, Vol. 174, page 359, respectively.

The elongations and conjunctions of the satellites and the positions of the rings of Saturn are computed from manuscript tables based on elements given by H. Struve in *Observations de Poulkova*, Supplement 1, St. Petersburg, 1888; *Publications de Poulkovo*, Second Series, Vol. XI, St. Petersburg, 1898; and *Astronomische Nachrichten*, 1903, Vol. 162, pages 325–344. The differential coordinates of Phœbe have been computed from elements and tables given in the *Annals of Harvard College Observatory*, 1905, Vol. LIII, No. VI.

The apparent dimensions of the rings of Saturn are computed from Bessel's data, except those for the dusky ring, which are based on the observations of various astronomers.

The elongations of the satellites of Uranus are computed from the data of Newcomb's *Uranian and Neptunian Systems, Washington Observations*, 1873, Appendix I.

The elongations of the satellite of Neptune are computed from manuscript tables based upon elements given by A. Hall in the *Astronomical Journal*, 1898, Vol. XIX, page 65.

The adopted apparent semidiameter of the Sun at the Earth's mean distance is 16′ 1″.50; while in the computation of eclipses the value given by AUWERS in the *Astronomische Nachrichten*, 1891, Vol. 128, page 367, is employed, viz., 15′ 59″.63.

In the computation of the ephemeris for physical observations of the Sun, page 611, the following elements by CARRINGTON have been used:

Inclination of the Sun's equator to the ecliptic	7° 15′
Longitude of the ascending node of the Sun's equator on the ecliptic	$73° 40' + 50''.25\ (t-1850)$
Sidereal period of rotation (mean solar days)	$25^d.38$

The apparent semidiameter of the Moon is computed from the Moon's equatorial horizontal parallax, π, by the formula,

$$S = 0.272\,506\ \pi + 1''.50$$

where the constant 0.272 506 is based on data from occultations given by J. PETERS in the *Astronomische Nachrichten*, 1895, Vol. 138, page 147; and the constant 1″.50 is added to cover the average effect of irradiation.

The value of the Moon's semidiameter employed in the computation of eclipses is computed from the formula,

$$S = 0.272\,274\ \pi$$

The ephemeris for physical observations of the Moon, pages 612–619, has been computed from formulæ and elements given by F. HAYN in *Abhandlungen der K. Sächsischen Gesell. der Wissenschaften*, Vols. 29 and 30, 1904, 1907.

The notation used for the geocentric librations of the Moon is as follows:

I=the mean inclination of the Moon's equator to the ecliptic ($=1°\ 32'.1$),
☊=the mean longitude of the Moon's ascending node, or the mean longitude of the descending node of the Moon's equator,
C=the angle at the center of the Moon's disk made by a lunar meridian with the circle of declination, counted from north to east on the apparent disk,
$\lambda, \beta, \alpha, \delta$=the geocentric longitude, latitude, right ascension, and declination of the Moon,
$i, \varDelta, \text{☊}', \text{☾}$=the quantities defined on page 212, where their values for the current year are given,
g'=Earth's mean anomaly,
g=Moon's mean anomaly,
ω=Angular distance of Moon's perigee from the ascending node,
b, l=Optical librations in latitude and longitude, respectively,
$\delta b, \delta l$=Physical librations in latitude and longitude, respectively,
δC=Physical libration of C.

The Moon's geocentric librations in longitude and latitude or, in other words, the earth's selenographic longitude and latitude, are equal to $l+\delta l$ and $b+\delta b$, respectively, and may be found, for any time, by means of the following formulæ, in connection with the tables given on pages 212 and 213:—

$$\mu = -0'.617 \sin 2\,(\text{☊}-\lambda)$$
$$A = \sin I \cos(\text{☊}-\lambda)$$
$$\tan B = \tan I \sin(\text{☊}-\lambda)$$
$$\lambda' = \lambda + \mu + Ab$$
$$b = B - \beta$$
$$l = \lambda' - \text{☾}$$
$$\sin C = \sin i\,\frac{\cos(\lambda'+\varDelta-\text{☊})}{\cos\delta} = -\sin i\,\frac{\cos(\alpha-\text{☊}')}{\cos b}$$
$$\delta b = +108'' \sin(\omega+l) + 37'' \sin(\omega-l) - 11'' \sin(g+\omega-l)$$
$$\delta l = +12'' \sin g - 59'' \sin g' - 18'' \sin 2\omega$$
$$\qquad -[108'' \cos(\omega+l) - 37'' \cos(\omega-l) + 11'' \cos(g+\omega-l)] \tan b$$
$$\delta C = -[108'' \cos(\omega+l) - 37'' \cos(\omega-l) + 11'' \cos(g+\omega-l)] \sec b$$

The Sun's selenographic latitude and longitude have been computed from formulæ the same as those given above except that the heliocentric coordinates of the Moon have been substituted for the geocentric coordinates.

The following elements have been used in computing the ephemerides for physical observations of the planets Mars and Jupiter:

Position of north pole of Mars	$\alpha=21^h\ 10^m\ 0^s+1^s.565(t-1905)$ $\delta=54^\circ\ 30'\ .0''+12''.60(t-1905)$
Position of north pole of Jupiter	$\alpha=17^h\ 52^m\ 0^s.84+0^s.247(t-1910)$ $\delta=64^\circ\ 33'\ 34''.6-0''.60(t-1910)$
Rotation period of Mars	$24^h\ 37^m\ 22^s.65$
Rotation period of Jupiter, System I.	$9^h\ 50^m\ 30^s.004$
Rotation period of Jupiter, System II.	$9^h\ 55^m\ 40^s.632$
Longitude of Central Meridian of Mars, May 15, 1897, Greenwich Mean Noon	$52^\circ.01$
Longitude of Central Meridian of Jupiter (System I.), July 14, 1897, Greenwich Mean Noon	$47^\circ.31$
Longitude of Central Meridian of Jupiter (System II.), July 14, 1897, Greenwich Mean Noon	$96^\circ.58$

The position of the north pole of Mars is as given by LOWELL and CROMMELIN (see *Monthly Notices R. A. S.*, 1905, Vol. 66, page 56), while that of the north pole of Jupiter has been deduced from the position given by DAMOISEAU for 1750 (see *Tables Écliptiques des Satellites de Jupiter*, page (1)). The rotation periods of Mars and of Jupiter and the longitudes of the central meridians are according to MARTH (see *Monthly Notices R. A. S.*, 1896, Vol. 56, pages 395–403 and 517–524). The longitude of the Great Red Spot and the time of its transit across the Central Meridian given in the volumes for 1913 and 1914 are replaced by those of System II. of MARTH. This change has been made in view of the following facts: The Paris Conference of October, 1911, assigned to the office of the American Ephemeris and Nautical Almanac the preparation of the ephemerides for the physical observations of the planets; a general desire exists that the use of System II. of MARTH should not be discontinued; and the position of the Great Red Spot during the opposition of 1912 was about 70° from the place predicted from the elements adopted in the American Ephemeris and Nautical Almanac for 1913.

The adopted semidiameters of the planets are given on page xv, and their stellar magnitudes have been computed from formulæ given by G. MUELLER in *Publicationen des Astrophysikalischen Observatoriums zu Potsdam*, 1893, Vol. 8, page 366.

In the list of observatories, pages 670–679, the latitudes given are in most cases astronomical. In some instances they have been determined by geodetic triangulation from other points. The reductions from geographic to geocentric latitude, $\varphi'-\varphi$, and the distance from the center of the earth, ρ, are computed from the formulæ on page xiv, using the flattening $\frac{1}{297}$ obtained by JOHN F. HAYFORD in *Supplementary Investigation in 1909 of the Figure of the Earth and Isostasy*, U. S. Coast and Geodetic Survey, 1910, and adopted by the *Paris Conference*, October, 1911.

CHRONOLOGICAL ERAS AND CYCLES.

CHRONOLOGICAL ERAS.

THE YEAR 1915, WHICH COMPRISES THE LATTER PART OF THE 139TH AND THE BEGINNING OF THE 140TH YEAR OF THE INDEPENDENCE OF THE UNITED STATES OF AMERICA, CORRESPONDS TO—

The year 6628 of the Julian Period;

" 7423–7424 of the Byzantine era, the year 7424 commencing on September 1;

" 5675–5676 of the Jewish era, the year 5676 commencing on September 9, or, more exactly, at sunset on September 8;

" 2668 since the foundation of Rome, according to VARRO;

" 2662 since the beginning of the era of NABONASSAR, which has been assigned to Wednesday, the 26th of February of the 3967th year of the Julian Period; corresponding, in the notation of chronologists, to the 747th, and, in the notation of astronomers, to the 746th year before the birth of CHRIST;

" 2691 of the Olympiads, or the third year of the 673d Olympiad, commencing in July, 1915, if we fix the era of the Olympiads at 775½ years before CHRIST, or near the beginning of July of the year 3938 of the Julian Period;

" 2227 of the Grecian era, or the era of the SELEUCIDÆ, which began near the vernal equinox of the year, $-311 =$ B. C. 312, $=4402$ of the Julian Period;

" 1631 of the era of DIOCLETIAN;

" 2575 of the Japanese era and to the 4th year of the period entitled Taisho.

The year 1334 of the Mohammedan era, or the era of the Hegira, begins on the 9th day of November, 1915.

The first day of January of the year 1915 is the 2,420,499th day since the commencement of the Julian Period.

CHRONOLOGICAL CYCLES.

Dominical Letter	C	Solar Cycle	20
Epact	14	Roman Indiction	13
Lunar Cycle or Golden Number	16	Julian Period	6628

ASTRONOMICAL CONSTANTS.

	$''$	
Solar Parallax	8.80	Paris Conference.
Constant of Nutation	9.21	
Constant of Aberration	20.47	
General Precession	$50''.2564+0''.000\,222(t-1900)$	Newcomb.
Obliquity of the Ecliptic	$23^\circ\ 27'\ 8''.26-0''.4684(t-1900)$	
Equatorial Horizontal Parallax of the Moon	$57'\ 2''.63$*	(Newcomb).

Mean distance Earth to Moon 384 395 kilometers = 238 851 miles, or 60.2669 radii.

Mean distance Earth to Sun 149 499 935 kilometers = 92 894 767 statute miles.

Velocity of light 299 860 kilometers = 186 324 statute miles per second (Newcomb and Michelson).

Light travels unit distance in $498^s.566$.

Gaussian Gravitation Constant, †$k=0.017\,202\,099=3\,548''.187\,61$.

Acceleration in one sec. due to gravity, $g=9\overset{m}{.}8060-0\overset{m}{.}0260\cos 2\varphi-\frac{2h}{R}g$.‡ Helmert.

Length of seconds pendulum, $l=0\overset{m}{.}993\,549-0\overset{m}{.}002\,631\cos 2\varphi-\frac{2h}{R}l$.‡

Length of the year:

	d	
Tropical (ordinary)	$365.242\,198\,79-0.000\,000\,0614\,(t-1900)$	Newcomb.
Sidereal	$365.256\,360\,42+0.000\,000\,0011\,(t-1900)$	
Anomalistic	$365.259\,641\,34+0.000\,000\,0304\,(t-1900)$	
Eclipse	$346.620\,000\quad+0.000\,000\,36\quad(t-1900)$	

Length of the month:

	d	d	h	m	s	
Synodical (ordinary)	29.530 588 =	29	12	44	2.8	Hansen.
Tropical	27.321 582 =	27	7	43	4.7	
Sidereal	27.321 661 =	27	7	43	11.5	
Anomalistic	27.554 550 =	27	13	18	33.1	
Nodical	27.212 219 =	27	5	5	35.7	

Length of the day:

	h	m	s	
Sidereal	23	56	4.091	of mean solar time.
Mean Solar	24	3	56.555	of sidereal time.

Dimensions of the Earth (Hayford's Spheroid of 1909):

Equatorial Radius, $a=6378.388$ kilometers or 3963.34 statute miles.

Polar Radius, $b=6356.909$ " or 3949.99 " "

Flattening, $\frac{a-b}{a}=\frac{1}{297.0}$

Logarithm of the eccentricity $\frac{\sqrt{a^2-b^2}}{a}=\log e=8.913\,804$

Logarithm radius $=\log\rho=9.999\,2695+0.000\,7324\cos 2\varphi-0.000\,0019\cos 4\varphi$.

Reduction from geographic latitude φ to geocentric latitude φ',

$$\varphi'-\varphi=-11'\ 35''.66\sin 2\varphi+1''.17\sin 4\varphi.$$

1 meter = 3.280 8333 feet. 1 foot = 0.304 8006 meters.

1 statute mile = 0.868 392 nautical or geographical miles.

1 nautical mile = 1.151 553 statute miles.

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* Used in the computation of eclipses. The parallax used in the computation of the ephemeris of the Moon contained in this volume is $57'\ 2''.23$ (Hansen).

† k^2 is the acceleration due to the Sun's attraction at the mean distance of the Earth from the Sun, which is also the astronomical unit of distance, the unit of time being one mean solar day.

‡ φ = latitude, h = elevation above sea level in meters, and $\log R=6.80416$.

NOTE.—The above values of $\log\rho$ and $\varphi'-\varphi$ were computed with the eccentricity that results from assuming that the flattening of the earth is exactly $\frac{1}{297}$.

ASTRONOMICAL CONSTANTS.

SEMIDIAMETERS OF THE SUN, MOON, AND PLANETS.

Name.	At unit Distance.	At mean least Distance.	In Kilometers.	In Statute Miles.	Authority.
	′ ″	″			
Sun	15 59.63	. .	695 533.61	432 183.68	Auwers.
Moon	15 32.58*	. .	1 737.96	1 079.91	Newcomb.
Mercury	3.34	5.45	2 420.82	1 504.24	Le Verrier.
Venus	8.55	30.90	6 197.01	3 850.67	Peirce.
Mars	5.05	9.64	3 660.22	2 274.37	Peirce.
Jupiter (Equatorial) . . .	1 40.20	23.84	72 624.56	45 127.16	Am. Eph.
Jupiter (Polar)	1 34.12	22.40	68 217.80	42 388.90	Peirce.
Saturn (Equatorial) . . .	1 24.88	9.94	61 520.69	38 227.48	Barnard.
Saturn (Polar)	1 17.47	9.07	56 149.95	34 890.23	Barnard.
Uranus	33.52	1.84	24 295.16	15 096.43	Am. Eph.
Neptune	38.66	1.33	28 020.61	17 411.34	Am. Eph.

ELEMENTS OF THE PLANETARY ORBITS FOR THE EPOCH 1915—January 0^d G. M. T.

Name.	Mean Distance.	Sidereal Period in Tropical Years.	Sidereal mean daily Motion.	Synodic Period in Tropical Years.	Eccentricity.
			″		
☿ Mercury	0.387 099	0.240 85	14 732.420	0.317 26	0.205 6173
♀ Venus	0.723 331	0.615 21	5 767.670	1.598 72	0.006 8135
⊕ Earth	1.000 000	1.000 04	3 548.193	. . .	0.016 7448
♂ Mars	1.523 688	1.880 89	1 886.519	2.135 39	0.093 3225
♃ Jupiter	5.202 803	11.862 23	299.128	1.092 11	0.048 3620
♄ Saturn	9.538 843	29.457 72	120.455	1.035 18	0.055 8379
⛢ Uranus	19.190 978	84.015 29	42.23	1.012 09	0.047 0865
♆ Neptune	30.070 672	164.788 29	21.53	1.006 14	0.008 5428

Name.	Inclination to the Ecliptic.	Mean Longitude of the Node.	Mean Longitude of the Perihelion.	Mean Longitude at the Epoch.	Logarithm of Mass in Unit of Sun's Mass.
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	
☿ Mercury	7 0 11.4	47 19 25.3	76 7 58.8	276 13 13.51	3.221 8487 − 10
♀ Venus	3 23 37.6	75 54 52.6	130 22 30.0	119 26 49.99	4.389 3398 − 10
⊕ Earth	. . .	. . .	101 28 43.3	99 4 22.04	4.482 2896 − 10
♂ Mars	1 51 1.0	48 54 5.8	334 29 40.4	284 36 34.04	3.509 5499 − 10
♃ Jupiter	1 18 28.5	99 35 22.4	12 57 11.8	333 25 58.17	6.979 9082 − 10
♄ Saturn	2 29 30.1	112 54 51.8	91 22 57.3	90 3 59.41	6.455 7335 − 10
⛢ Uranus	0 46 21.9	73 33 56.5	169 17 18.6	307 50 20.14	5.640 7528 − 10
♆ Neptune	1 46 40.1	130 50 37.5	43 53 12.1	118 0 1.18	5.705 5338 − 10

The elements of the four inner planets are derived from those given by NEWCOMB in Vol. VI of the *Astronomical Papers of the American Ephemeris*, and are the same as those used in computing the ephemerides of these planets. Those of Jupiter, Saturn, Uranus, and Neptune are taken from Vol. VII of the *Astronomical Papers* for the epoch of the tables. They are reduced to 1915 by applying LE VERRIER's variations, and can not be regarded as being strictly identical with the elements used in computing the ephemerides of those planets in this volume.

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*At mean distance. See Ast. Papers Am. Eph., Vol. IX, p. 39. For the values of the semidiameter used in this volume see page xi.

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S							Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.		
		True Longitude.					Diff. for 1 Hour.	Latitude.					
		λ			λ'								
		°	'	"	'	"	"	"			h	m	s
1	1	280	0	32.9	0	23.8	152.85	+0.43	9.992 6547	− 1.5	5	18	54.39
2	2	281	1	41.3	1	32.0	152.85	0.33	9.992 6526	− 0.3	5	14	58.48
3	3	282	2	49.8	2	40.3	152.85	0.22	9.992 6533	+ 0.9	5	11	2.57
4	4	283	3	58.4	3	48.6	152.86	+0.09	9.992 6568	+ 2.0	5	7	6.66
5	5	284	5	7.1	4	57.2	152.86	−0.04	9.992 6631	3.2	5	3	10.74
6	6	285	6	15.9	6	5.8	152.87	0.17	9.992 6720	4.3	4	59	14.83
7	7	286	7	24.9	7	14.6	152.87	−0.29	9.992 6836	+ 5.3	4	55	18.92
8	8	287	8	33.9	8	23.5	152.88	0.39	9.992 6976	6.3	4	51	23.01
9	9	288	9	43.1	9	32.5	152.88	0.47	9.992 7138	7.2	4	47	27.10
10	10	289	10	52.4	10	41.5	152.89	−0.52	9.992 7323	+ 8.1	4	43	31.18
11	11	290	12	1.7	11	50.6	152.89	0.54	9.992 7527	8.9	4	39	35.27
12	12	291	13	10.9	12	59.6	152.88	0.53	9.992 7750	9.7	4	35	39.36
13	13	292	14	20.0	14	8.6	152.87	−0.48	9.992 7990	+10.4	4	31	43.44
14	14	293	15	28.8	15	17.2	152.86	0.40	9.992 8247	11.0	4	27	47.53
15	15	294	16	37.3	16	25.5	152.84	0.29	9.992 8520	11.7	4	23	51.62
16	16	295	17	45.4	17	33.4	152.82	−0.17	9.992 8807	+12.3	4	19	55.71
17	17	296	18	52.8	18	40.7	152.80	−0.03	9.992 9111	13.0	4	15	59.80
18	18	297	19	59.7	19	47.3	152.77	+0.10	9.992 9430	13.7	4	12	3.88
19	19	298	21	5.7	20	53.2	152.74	+0.23	9.992 9767	+14.4	4	8	7.97
20	20	299	22	10.9	21	58.2	152.70	0.35	9.993 0121	15.1	4	4	12.06
21	21	300	23	15.2	23	2.3	152.66	0.46	9.993 0494	15.9	4	0	16.15
22	22	301	24	18.6	24	5.5	152.62	+0.54	9.993 0887	+16.8	3	56	20.24
23	23	302	25	20.9	25	7.7	152.58	0.60	9.993 1300	17.7	3	52	24.32
24	24	303	26	22.3	26	8.9	152.54	0.63	9.993 1734	18.6	3	48	28.41
25	25	304	27	22.6	27	9.1	152.49	+0.63	9.993 2191	+19.5	3	44	32.50
26	26	305	28	21.8	28	8.2	152.44	0.61	9.993 2670	20.5	3	40	36.59
27	27	306	29	20.0	29	6.0	152.39	0.57	9.993 3174	21.5	3	36	40.68
28	28	307	30	17.0	30	2.9	152.35	+0.50	9.993 3702	+22.5	3	32	44.77
29	29	308	31	13.0	30	58.7	152.31	0.41	9.993 4255	23.6	3	28	48.86
30	30	309	32	7.9	31	53.5	152.27	0.30	9.993 4833	24.6	3	24	52.95
31	31	310	33	1.7	32	47.1	152.22	0.17	9.993 5438	25.7	3	20	57.04
32	32	311	33	54.5	33	39.8	152.18	+0.03	9.993 6068	+26.8	3	17	1.12

NOTE.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ' are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,
$-9^s.8296$.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 8.4	15 12.1	55 27.96	+1.126	55 41.69	+1.160	12 30.6	2.21	15.4
2	15 16.0	15 19.9	55 55.75	1.183	56 10.06	1.200	13 22.7	2.13	16.4
3	15 23.8	15 27.8	56 24.52	1.209	56 39.05	1.212	14 12.6	2.03	17.4
4	15 31.7	15 35.7	56 53.60	+1.212	57 8.14	+1.211	15 0.3	1.95	18.4
5	15 39.6	15 43.6	57 22.66	1.208	57 37.13	1.203	15 46.4	1.90	19.4
6	15 47.5	15 51.4	57 51.52	1.195	58 5.79	1.183	16 32.0	1.90	20.4
7	15 55.2	15 59.0	58 19.89	+1.166	58 33.74	+1.140	17 18.3	1.97	21.4
8	16 2.7	16 6.2	58 47.20	1.101	59 0.11	1.048	18 6.8	2.09	22.4
9	16 9.5	16 12.6	59 12.27	0.976	59 23.44	0.882	18 58.9	2.26	23.4
10	16 15.2	16 17.5	59 33.35	+0.764	59 41.68	+0.620	19 55.4	2.45	24.4
11	16 19.3	16 20.4	59 48.12	0.450	59 52.37	+0.255	20 56.4	2.62	25.4
12	16 20.9	16 20.7	59 54.14	+0.037	59 53.18	−0.199	22 0.4	2.69	26.4
13	16 19.6	16 17.7	59 49.32	−0.446	59 42.47	−0.696	23 4.4	2.62	27.4
14	16 15.1	16 11.6	59 32.62	0.944	59 19.86	1.179	☌	. .	28.4
15	16 7.4	16 2.5	59 4.40	1.393	58 46.53	1.580	0 5.4	2.45	29.4
16	15 57.1	15 51.2	58 26.61	−1.734	58 5.07	−1.850	1 1.5	2.23	0.9
17	15 45.0	15 38.6	57 42.38	1.926	57 19.02	1.961	1 52.5	2.02	1.9
18	15 32.2	15 25.9	56 55.49	1.954	56 32.27	1.910	2 39.0	1.87	2.9
19	15 19.8	15 14.0	56 9.80	−1.829	55 48.49	−1.718	3 22.4	1.76	3.9
20	15 8.6	15 3.7	55 28.69	1.578	55 10.72	1.413	4 3.9	1.71	4.9
21	14 59.4	14 55.7	54 54.85	1.229	54 41.28	1.030	4 44.8	1.71	5.9
22	14 52.6	14 50.3	54 30.17	−0.820	54 21.63	−0.603	5 26.3	1.75	6.9
23	14 48.7	14 47.8	54 15.72	−0.382	54 12.47	−0.160	6 9.3	1.84	7.9
24	14 47.6	14 48.2	54 11.88	+0.060	54 13.89	+0.273	6 54.7	1.95	8.9
25	14 49.4	14 51.3	54 18.40	+0.477	54 25.28	+0.668	7 43.0	2.07	9.9
26	14 53.8	14 56.8	54 34.38	0.846	54 45.52	1.007	8 34.0	2.18	10.9
27	15 0.3	15 4.3	54 58.47	1.148	55 12.98	1.266	9 27.2	2.24	11.9
28	15 8.6	15 13.2	55 28.76	+1.360	55 45.54	+1.433	10 21.0	2.24	12.9
29	15 17.9	15 22.8	56 3.04	1.479	56 20.93	1.498	11 14.3	2.19	13.9
30	15 27.7	15 32.5	56 38.88	1.490	56 56.61	1.461	12 5.8	2.10	14.9
31	15 37.2	15 41.7	57 13.85	1.410	57 30.36	1.339	12 55.3	2.02	15.9
32	15 46.0	15 49.9	57 45.91	+1.250	58 0.31	+1.149	13 43.0	1.95	16.9

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 1.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	6 44 4.38	2.3162	N. 26 51 17.2	4.257
1	6 46 23.31	2.3148	26 46 57.4	4.402
2	6 48 42.16	2.3134	26 42 28.9	4.547
3	6 51 0.92	2.3118	26 37 51.8	4.691
4	6 53 19.58	2.3102	26 33 6.0	4.834
5	6 55 38.14	2.3084	26 28 11.7	4.977
6	6 57 56.59	2.3067	26 23 8.8	5.120
7	7 0 14.94	2.3048	26 17 57.3	5.262
8	7 2 33.17	2.3028	26 12 37.3	5.404
9	7 4 51.28	2.3008	26 7 8.8	5.545
10	7 7 9.26	2.2986	26 1 31.9	5.686
11	7 9 27.11	2.2964	25 55 46.5	5.827
12	7 11 44.83	2.2942	25 49 52.7	5.966
13	7 14 2.41	2.2918	25 43 50.6	6.105
14	7 16 19.85	2.2894	25 37 40.1	6.244
15	7 18 37.14	2.2869	25 31 21.3	6.382
16	7 20 54.28	2.2844	25 24 54.2	6.520
17	7 23 11.27	2.2818	25 18 18.9	6.657
18	7 25 28.10	2.2792	25 11 35.4	6.793
19	7 27 44.77	2.2764	25 4 43.7	6.928
20	7 30 1.27	2.2736	24 57 44.0	7.063
21	7 32 17.60	2.2708	24 50 36.1	7.198
22	7 34 33.76	2.2678	24 43 20.2	7.331
23	7 36 49.74	2.2648	N. 24 35 56.4	7.463

SATURDAY 2.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	7 39 5.54	2.2618	N. 24 28 24.6	7.596
1	7 41 21.16	2.2588	24 20 44.9	7.727
2	7 43 36.60	2.2558	24 12 57.4	7.857
3	7 45 51.85	2.2525	24 5 2.0	7.987
4	7 48 6.90	2.2493	23 56 58.9	8.117
5	7 50 21.77	2.2462	23 48 48.0	8.245
6	7 52 36.44	2.2428	23 40 29.5	8.372
7	7 54 50.91	2.2395	23 32 3.4	8.498
8	7 57 5.18	2.2362	23 23 29.7	8.624
9	7 59 19.25	2.2328	23 14 48.5	8.749
10	8 1 33.12	2.2294	23 5 59.8	8.873
11	8 3 46.78	2.2259	22 57 3.7	8.996
12	8 6 0.23	2.2224	22 48 0.3	9.118
13	8 8 13.47	2.2189	22 38 49.5	9.240
14	8 10 26.50	2.2154	22 29 31.5	9.361
15	8 12 39.32	2.2119	22 20 6.2	9.481
16	8 14 51.93	2.2083	22 10 33.8	9.598
17	8 17 4.32	2.2048	22 0 54.4	9.716
18	8 19 16.50	2.2012	21 51 7.9	9.833
19	8 21 28.46	2.1975	21 41 14.4	9.949
20	8 23 40.20	2.1939	21 31 14.0	10.064
21	8 25 51.73	2.1903	21 21 6.7	10.178
22	8 28 3.03	2.1866	21 10 52.6	10.291
23	8 30 14.12	2.1829	21 0 31.8	10.402
24	8 32 24.98	2.1793	N. 20 50 4.3	10.514

SUNDAY 3.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	8 32 24.98	2.1793	N. 20 50 4.3	10.514
1	8 34 35.63	2.1757	20 39 30.1	10.624
2	8 36 46.06	2.1720	20 28 49.4	10.732
3	8 38 56.27	2.1683	20 18 2.2	10.841
4	8 41 6.26	2.1647	20 7 8.5	10.949
5	8 43 16.03	2.1610	19 56 8.4	11.054
6	8 45 25.58	2.1573	19 45 2.0	11.159
7	8 47 34.91	2.1538	19 33 49.3	11.262
8	8 49 44.03	2.1502	19 22 30.5	11.365
9	8 51 52.93	2.1465	19 11 5.5	11.467
10	8 54 1.61	2.1428	18 59 34.4	11.568
11	8 56 10.07	2.1393	18 47 57.3	11.668
12	8 58 18.32	2.1357	18 36 14.2	11.767
13	9 0 26.35	2.1322	18 24 25.3	11.864
14	9 2 34.18	2.1287	18 12 30.5	11.961
15	9 4 41.79	2.1252	18 0 30.0	12.056
16	9 6 49.20	2.1217	17 48 23.8	12.150
17	9 8 56.39	2.1182	17 36 12.0	12.243
18	9 11 3.38	2.1148	17 23 54.6	12.336
19	9 13 10.16	2.1113	17 11 31.7	12.427
20	9 15 16.74	2.1080	16 59 3.4	12.517
21	9 17 23.12	2.1047	16 46 29.7	12.606
22	9 19 29.30	2.1013	16 33 50.7	12.694
23	9 21 35.28	2.0981	N. 16 21 6.4	12.781

MONDAY 4.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	9 23 41.07	2.0949	N. 16 8 17.0	12.866
1	9 25 46.67	2.0917	15 55 22.5	12.951
2	9 27 52.07	2.0884	15 42 22.9	13.034
3	9 29 57.28	2.0853	15 29 18.4	13.116
4	9 32 2.31	2.0823	15 16 9.0	13.197
5	9 34 7.15	2.0792	15 2 54.7	13.278
6	9 36 11.81	2.0762	14 49 35.6	13.357
7	9 38 16.29	2.0733	14 36 11.9	13.434
8	9 40 20.60	2.0703	14 22 43.5	13.511
9	9 42 24.73	2.0674	14 9 10.6	13.587
10	9 44 28.69	2.0647	13 55 33.1	13.662
11	9 46 32.49	2.0619	13 41 51.2	13.734
12	9 48 36.12	2.0592	13 28 5.0	13.807
13	9 50 39.59	2.0565	13 14 14.4	13.877
14	9 52 42.90	2.0539	13 0 19.7	13.947
15	9 54 46.06	2.0514	12 46 20.7	14.017
16	9 56 49.07	2.0489	12 32 17.7	14.084
17	9 58 51.93	2.0464	12 18 10.6	14.151
18	10 0 54.64	2.0441	12 3 59.6	14.217
19	10 2 57.22	2.0418	11 49 44.6	14.282
20	10 4 59.65	2.0394	11 35 25.8	14.344
21	10 7 1.95	2.0373	11 21 3.3	14.406
22	10 9 4.12	2.0351	11 6 37.1	14.467
23	10 11 6.16	2.0330	10 52 7.2	14.527
24	10 13 8.08	2.0310	N. 10 37 33.8	14.586

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 5.					**THURSDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	10 13 8.08	2.0310	N. 10 37 33.8	14.586	0	11 49 41.10	2.0228	S. 1 48 23.7	16.044
1	10 15 9.88	2.0291	10 22 56.9	14.643	1	11 51 42.52	2.0247	2 4 26.4	16.045
2	10 17 11.57	2.0272	10 8 16.6	14.700	2	11 53 44.06	2.0267	2 20 29.1	16.044
3	10 19 13.14	2.0253	9 53 32.9	14.755	3	11 55 45.72	2.0287	2 36 31.7	16.042
4	10 21 14.61	2.0237	9 38 46.0	14.809	4	11 57 47.50	2.0308	2 52 34.2	16.040
5	10 23 15.98	2.0219	9 23 55.8	14.862	5	11 59 49.42	2.0331	3 8 36.5	16.036
6	10 25 17.24	2.0203	9 9 2.5	14.914	6	12 1 51.47	2.0354	3 24 38.5	16.030
7	10 27 18.41	2.0188	8 54 6.1	14.965	7	12 3 53.67	2.0379	3 40 40.1	16.023
8	10 29 19.49	2.0173	8 39 6.7	15.015	8	12 5 56.02	2.0404	3 56 41.3	16.016
9	10 31 20.48	2.0159	8 24 4.3	15.064	9	12 7 58.52	2.0430	4 12 42.0	16.007
10	10 33 21.40	2.0146	8 8 59.0	15.112	10	12 10 1.18	2.0458	4 28 42.1	15.996
11	10 35 22.23	2.0133	7 53 50.9	15.158	11	12 12 4.01	2.0485	4 44 41.5	15.983
12	10 37 22.99	2.0121	7 38 40.1	15.202	12	12 14 7.00	2.0513	5 0 40.1	15.970
13	10 39 23.68	2.0110	7 23 26.6	15.246	13	12 16 10.17	2.0544	5 16 37.9	15.955
14	10 41 24.31	2.0099	7 8 10.6	15.288	14	12 18 13.53	2.0575	5 32 34.7	15.939
15	10 43 24.87	2.0089	6 52 52.0	15.331	15	12 20 17.07	2.0606	5 48 30.6	15.922
16	10 45 25.38	2.0081	6 37 30.9	15.372	16	12 22 20.80	2.0638	6 4 25.4	15.903
17	10 47 25.84	2.0073	6 22 7.4	15.411	17	12 24 24.73	2.0673	6 20 19.0	15.883
18	10 49 26.25	2.0065	6 6 41.6	15.448	18	12 26 28.87	2.0707	6 36 11.4	15.862
19	10 51 26.62	2.0058	5 51 13.6	15.485	19	12 28 33.21	2.0742	6 52 2.4	15.838
20	10 53 26.95	2.0053	5 35 43.4	15.522	20	12 30 37.77	2.0778	7 7 52.0	15.814
21	10 55 27.25	2.0048	5 20 11.0	15.557	21	12 32 42.55	2.0815	7 23 40.1	15.788
22	10 57 27.52	2.0043	5 4 36.6	15.589	22	12 34 47.55	2.0853	7 39 26.6	15.761
23	10 59 27.77	2.0040	N. 4 49 0.3	15.622	23	12 36 52.79	2.0893	S. 7 55 11.4	15.732
	WEDNESDAY 6.					**FRIDAY 8.**			
0	11 1 28.00	2.0038	N. 4 33 22.0	15.653	0	12 38 58.26	2.0932	S. 8 10 54.5	15.702
1	11 3 28.22	2.0036	4 17 41.9	15.683	1	12 41 3.97	2.0973	8 26 35.7	15.671
2	11 5 28.43	2.0034	4 2 0.0	15.712	2	12 43 9.93	2.1014	8 42 15.0	15.637
3	11 7 28.63	2.0034	3 46 16.5	15.739	3	12 45 16.14	2.1058	8 57 52.2	15.603
4	11 9 28.84	2.0035	3 30 31.3	15.766	4	12 47 22.62	2.1101	9 13 27.4	15.568
5	11 11 29.05	2.0036	3 14 44.6	15.792	5	12 49 29.35	2.1144	9 29 0.4	15.530
6	11 13 29.27	2.0039	2 58 56.3	15.816	6	12 51 36.35	2.1190	9 44 31.0	15.491
7	11 15 29.52	2.0043	2 43 6.7	15.838	7	12 53 43.63	2.1236	9 59 59.3	15.451
8	11 17 29.78	2.0046	2 27 15.7	15.860	8	12 55 51.18	2.1283	10 15 25.1	15.409
9	11 19 30.07	2.0051	2 11 23.5	15.881	9	12 57 59.02	2.1331	10 30 48.4	15.366
10	11 21 30.39	2.0057	1 55 30.0	15.901	10	13 0 7.15	2.1379	10 46 9.0	15.321
11	11 23 30.75	2.0063	1 39 35.4	15.918	11	13 2 15.57	2.1428	11 1 26.9	15.274
12	11 25 31.15	2.0071	1 23 39.8	15.935	12	13 4 24.29	2.1479	11 16 41.9	15.226
13	11 27 31.60	2.0078	1 7 43.2	15.951	13	13 6 33.32	2.1530	11 31 54.0	15.177
14	11 29 32.09	2.0088	0 51 45.7	15.966	14	13 8 42.65	2.1582	11 47 3.1	15.125
15	11 31 32.65	2.0098	0 35 47.3	15.980	15	13 10 52.30	2.1635	12 2 9.0	15.072
16	11 33 33.27	2.0108	0 19 48.1	15.992	16	13 13 2.27	2.1688	12 17 11.7	15.018
17	11 35 33.95	2.0120	N. 0 3 48.3	16.002	17	13 15 12.56	2.1743	12 32 11.2	14.962
18	11 37 34.71	2.0133	S. 0 12 12.1	16.012	18	13 17 23.18	2.1798	12 47 7.2	14.904
19	11 39 35.55	2.0147	0 28 13.1	16.021	19	13 19 34.14	2.1854	13 1 59.7	14.845
20	11 41 36.47	2.0161	0 44 14.6	16.028	20	13 21 45.43	2.1911	13 16 48.6	14.784
21	11 43 37.48	2.0176	1 0 16.5	16.034	21	13 23 57.07	2.1968	13 31 33.8	14.722
22	11 45 38.58	2.0193	1 16 18.7	16.038	22	13 26 9.05	2.2027	13 46 15.2	14.657
23	11 47 39.79	2.0210	1 32 21.1	16.042	23	13 28 21.39	2.2086	14 0 52.7	14.592
24	11 49 41.10	2.0228	S. 1 48 23.7	16.044	24	13 30 34.08	2.2146	S. 14 15 26.2	14.524

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 9.			
	h m s	s	° ′ ″	″
0	13 30 34.08	2.2146	S. 14 15 26.2	14.524
1	13 32 47.14	2.2207	14 29 55.6	14.455
2	13 35 0.56	2.2268	14 44 20.8	14.384
3	13 37 14.35	2.2329	14 58 41.7	14.312
4	13 39 28.51	2.2393	15 12 58.2	14.237
5	13 41 43.06	2.2457	15 27 10.2	14.161
6	13 43 57.99	2.2520	15 41 17.5	14.082
7	13 46 13.30	2.2584	15 55 20.1	14.004
8	13 48 29.00	2.2649	16 9 18.0	13.923
9	13 50 45.09	2.2715	16 23 10.9	13.839
10	13 53 1.58	2.2782	16 36 58.7	13.754
11	13 55 18.47	2.2848	16 50 41.4	13.667
12	13 57 35.76	2.2916	17 4 18.8	13.579
13	13 59 53.46	2.2984	17 17 50.9	13.489
14	14 2 11.57	2.3053	17 31 17.5	13.397
15	14 4 30.09	2.3122	17 44 38.6	13.304
16	14 6 49.03	2.3192	17 57 54.0	13.207
17	14 9 8.39	2.3262	18 11 3.5	13.110
18	14 11 28.17	2.3332	18 24 7.2	13.012
19	14 13 48.37	2.3403	18 37 4.9	12.911
20	14 16 9.00	2.3474	18 49 56.5	12.807
21	14 18 30.06	2.3546	19 2 41.7	12.702
22	14 20 51.55	2.3618	19 15 20.7	12.596
23	14 23 13.47	2.3690	S. 19 27 53.2	12.487
	SUNDAY 10.			
0	14 25 35.83	2.3763	S. 19 40 19.2	12.377
1	14 27 58.62	2.3835	19 52 38.5	12.265
2	14 30 21.85	2.3908	20 4 51.0	12.150
3	14 32 45.52	2.3982	20 16 56.5	12.034
4	14 35 9.63	2.4054	20 28 55.1	11.917
5	14 37 34.17	2.4128	20 40 46.5	11.797
6	14 39 59.16	2.4202	20 52 30.7	11.676
7	14 42 24.59	2.4275	21 4 7.6	11.552
8	14 44 50.46	2.4348	21 15 37.0	11.427
9	14 47 16.77	2.4422	21 26 58.8	11.299
10	14 49 43.52	2.4496	21 38 12.9	11.170
11	14 52 10.72	2.4569	21 49 19.2	11.039
12	14 54 38.35	2.4642	22 0 17.6	10.907
13	14 57 6.42	2.4716	22 11 8.0	10.772
14	14 59 34.94	2.4789	22 21 50.2	10.635
15	15 2 3.89	2.4862	22 32 24.2	10.497
16	15 4 33.28	2.4934	22 42 49.8	10.357
17	15 7 3.10	2.5007	22 53 7.0	10.215
18	15 9 33.36	2.5078	23 3 15.6	10.071
19	15 12 4.04	2.5150	23 13 15.5	9.925
20	15 14 35.16	2.5222	23 23 6.6	9.777
21	15 17 6.70	2.5292	23 32 48.8	9.628
22	15 19 38.66	2.5363	23 42 22.0	9.477
23	15 22 11.05	2.5433	23 51 46.1	9.325
24	15 24 43.85	2.5501	S. 24 1 1.0	9.171

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 11.			
	h m s	s	° ′ ″	″
0	15 24 43.85	2.5501	S. 24 1 1.0	9.171
1	15 27 17.06	2.5570	24 10 6.6	9.014
2	15 29 50.69	2.5638	24 19 2.7	8.856
3	15 32 24.72	2.5705	24 27 49.3	8.696
4	15 34 59.15	2.5772	24 36 26.2	8.534
5	15 37 33.98	2.5838	24 44 53.4	8.372
6	15 40 9.20	2.5902	24 53 10.8	8.207
7	15 42 44.80	2.5966	25 1 18.2	8.040
8	15 45 20.79	2.6029	25 9 15.6	7.872
9	15 47 57.15	2.6091	25 17 2.9	7.703
10	15 50 33.88	2.6153	25 24 40.0	7.532
11	15 53 10.98	2.6213	25 32 6.7	7.359
12	15 55 48.43	2.6271	25 39 23.1	7.185
13	15 58 26.23	2.6329	25 46 28.9	7.009
14	16 1 4.38	2.6387	25 53 24.2	6.832
15	16 3 42.87	2.6443	26 0 8.8	6.653
16	16 6 21.69	2.6497	26 6 42.6	6.473
17	16 9 0.83	2.6549	26 13 5.6	6.292
18	16 11 40.28	2.6601	26 19 17.7	6.110
19	16 14 20.04	2.6651	26 25 18.8	5.926
20	16 17 0.09	2.6699	26 31 8.8	5.740
21	16 19 40.43	2.6748	26 36 47.6	5.553
22	16 22 21.06	2.6794	26 42 15.2	5.367
23	16 25 1.96	2.6838	S. 26 47 31.6	5.178
	TUESDAY 12.			
0	16 27 43.12	2.6882	S. 26 52 36.6	4.987
1	16 30 24.54	2.6923	26 57 30.1	4.797
2	16 33 6.20	2.6963	27 2 12.2	4.605
3	16 35 48.09	2.7000	27 6 42.7	4.412
4	16 38 30.20	2.7037	27 11 1.6	4.217
5	16 41 12.53	2.7072	27 15 8.8	4.023
6	16 43 55.06	2.7104	27 19 4.4	3.827
7	16 46 37.78	2.7135	27 22 48.1	3.630
8	16 49 20.68	2.7164	27 26 20.0	3.433
9	16 52 3.75	2.7193	27 29 40.1	3.236
10	16 54 46.99	2.7218	27 32 48.3	3.037
11	16 57 30.37	2.7242	27 35 44.5	2.837
12	17 0 13.89	2.7263	27 38 28.8	2.637
13	17 2 57.53	2.7283	27 41 1.0	2.437
14	17 5 41.29	2.7302	27 43 21.2	2.236
15	17 8 25.15	2.7318	27 45 29.3	2.033
16	17 11 9.10	2.7331	27 47 25.2	1.832
17	17 13 53.12	2.7343	27 49 9.1	1.630
18	17 16 37.22	2.7353	27 50 40.8	1.427
19	17 19 21.36	2.7361	27 52 0.4	1.225
20	17 22 5.55	2.7368	27 53 7.8	1.022
21	17 24 49.77	2.7371	27 54 3.0	0.818
22	17 27 34.00	2.7373	27 54 46.0	0.615
23	17 30 18.24	2.7373	27 55 16.8	0.412
24	17 33 2.48	2.7372	S. 27 55 35.5	0.209

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 13.					FRIDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 33 2.48	2.7372	S. 27 55 35.5	0.209	0	19 40 34.21	2.5163	S. 24 23 28.8	8.604
1	17 35 46.70	2.7367	27 55 41.9	−0.006	1	19 43 4.96	2.5086	24 14 48.1	8.752
2	17 38 30.88	2.7360	27 55 36.2	+0.197	2	19 45 35.24	2.5008	24 5 58.5	8.899
3	17 41 15.02	2.7352	27 55 18.3	0.400	3	19 48 5.06	2.4931	23 57 0.2	9.043
4	17 43 59.10	2.7341	27 54 48.2	0.602	4	19 50 34.41	2.4852	23 47 53.3	9.186
5	17 46 43.11	2.7328	27 54 6.0	0.805	5	19 53 3.28	2.4772	23 38 37.9	9.327
6	17 49 27.04	2.7314	27 53 11.6	1.007	6	19 55 31.67	2.4693	23 29 14.0	9.467
7	17 52 10.88	2.7298	27 52 5.1	1.208	7	19 57 59.59	2.4613	23 19 41.9	9.603
8	17 54 54.61	2.7279	27 50 46.6	1.409	8	20 0 27.02	2.4532	23 10 1.6	9.739
9	17 57 38.23	2.7258	27 49 16.0	1.611	9	20 2 53.97	2.4451	23 0 13.2	9.872
10	18 0 21.71	2.7236	27 47 33.3	1.811	10	20 5 20.43	2.4369	22 50 16.9	10.003
11	18 3 5.06	2.7212	27 45 38.7	2.010	11	20 7 46.40	2.4288	22 40 12.8	10.132
12	18 5 48.25	2.7184	27 43 32.1	2.210	12	20 10 11.88	2.4206	22 30 1.0	10.260
13	18 8 31.27	2.7156	27 41 13.5	2.408	13	20 12 36.87	2.4124	22 19 41.6	10.386
14	18 11 14.12	2.7126	27 38 43.1	2.606	14	20 15 1.37	2.4043	22 9 14.7	10.509
15	18 13 56.78	2.7093	27 36 0.8	2.802	15	20 17 25.38	2.3960	21 58 40.5	10.631
16	18 16 39.24	2.7059	27 33 6.8	2.998	16	20 19 48.89	2.3878	21 47 59.0	10.751
17	18 19 21.49	2.7023	27 30 1.0	3.194	17	20 22 11.91	2.3795	21 37 10.4	10.868
18	18 22 3.52	2.6986	27 26 43.5	3.388	18	20 24 34.43	2.3713	21 26 14.8	10.984
19	18 24 45.32	2.6946	27 23 14.4	3.581	19	20 26 56.46	2.3630	21 15 12.3	11.098
20	18 27 26.87	2.6904	27 19 33.8	3.773	20	20 29 17.99	2.3548	21 4 3.0	11.211
21	18 30 8.17	2.6861	27 15 41.6	3.965	21	20 31 39.03	2.3465	20 52 47.0	11.321
22	18 32 49.20	2.6816	27 11 38.0	4.155	22	20 33 59.57	2.3383	20 41 24.5	11.428
23	18 35 29.96	2.6770	S. 27 7 23.0	4.344	23	20 36 19.62	2.3301	S. 20 29 55.6	11.534
	THURSDAY 14.					SATURDAY 16.			
0	18 38 10.44	2.6722	S. 27 2 56.7	4.532	0	20 38 39.18	2.3218	S. 20 18 20.4	11.638
1	18 40 50.62	2.6671	26 58 19.1	4.719	1	20 40 58.24	2.3137	20 6 39.0	11.741
2	18 43 30.49	2.6619	26 53 30.4	4.904	2	20 43 16.82	2.3056	19 54 51.5	11.841
3	18 46 10.05	2.6567	26 48 30.6	5.088	3	20 45 34.91	2.2974	19 42 58.1	11.939
4	18 48 49.29	2.6513	26 43 19.8	5.271	4	20 47 52.51	2.2893	19 30 58.8	12.037
5	18 51 28.20	2.6456	26 37 58.1	5.452	5	20 50 9.62	2.2812	19 18 53.7	12.131
6	18 54 6.76	2.6398	26 32 25.5	5.632	6	20 52 26.25	2.2732	19 6 43.1	12.223
7	18 56 44.98	2.6340	26 26 42.2	5.811	7	20 54 42.40	2.2652	18 54 26.9	12.314
8	18 59 22.84	2.6280	26 20 48.2	5.988	8	20 56 58.07	2.2572	18 42 5.4	12.403
9	19 2 0.34	2.6219	26 14 43.6	6.165	9	20 59 13.26	2.2492	18 29 38.5	12.491
10	19 4 37.47	2.6156	26 8 28.4	6.339	10	21 1 27.97	2.2413	18 17 6.5	12.576
11	19 7 14.21	2.6092	26 2 2.9	6.511	11	21 3 42.21	2.2334	18 4 29.4	12.659
12	19 9 50.57	2.6027	25 55 27.1	6.682	12	21 5 55.98	2.2256	17 51 47.4	12.741
13	19 12 26.53	2.5960	25 48 41.1	6.852	13	21 8 9.28	2.2178	17 39 0.5	12.821
14	19 15 2.09	2.5892	25 41 44.9	7.020	14	21 10 22.12	2.2102	17 26 8.9	12.898
15	19 17 37.23	2.5823	25 34 38.7	7.186	15	21 12 34.50	2.2025	17 13 12.7	12.975
16	19 20 11.96	2.5754	25 27 22.6	7.351	16	21 14 46.42	2.1948	17 0 11.9	13.050
17	19 22 46.28	2.5684	25 19 56.6	7.513	17	21 16 57.88	2.1873	16 47 6.7	13.122
18	19 25 20.17	2.5611	25 12 21.0	7.674	18	21 19 8.90	2.1798	16 33 57.3	13.192
19	19 27 53.61	2.5538	25 4 35.7	7.834	19	21 21 19.46	2.1723	16 20 43.6	13.262
20	19 30 26.63	2.5467	24 56 40.9	7.992	20	21 23 29.58	2.1649	16 7 25.8	13.331
21	19 32 59.21	2.5392	24 48 36.7	8.147	21	21 25 39.25	2.1576	15 54 3.9	13.397
22	19 35 31.33	2.5316	24 40 23.3	8.301	22	21 27 48.49	2.1504	15 40 38.2	13.460
23	19 38 3.00	2.5240	24 32 0.6	8.454	23	21 29 57.30	2.1432	15 27 8.7	13.522
24	19 40 34.21	2.5163	S. 24 23 28.8	8.604	24	21 32 5.67	2.1360	S. 15 13 35.5	13.583

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 17.					TUESDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 32 5.67	2.1360	S. 15 13 35.5	13.583	0	23 7 49.60	1.8841	S. 3 39 39.6	14.832
1	21 34 13.62	2.1290	14 59 58.7	13.642	1	23 9 42.55	1.8808	3 24 49.7	14.829
2	21 36 21.15	2.1220	14 46 18.4	13.700	2	23 11 35.30	1.8777	3 10 0.1	14.825
3	21 38 28.26	2.1150	14 32 34.7	13.756	3	23 13 27.87	1.8747	2 55 10.7	14.821
4	21 40 34.95	2.1081	14 18 47.7	13.810	4	23 15 20.26	1.8718	2 40 21.6	14.815
5	21 42 41.23	2.1013	14 4 57.5	13.862	5	23 17 12.48	1.8688	2 25 32.9	14.808
6	21 44 47.11	2.0946	13 51 4.2	13.913	6	23 19 4.52	1.8660	2 10 44.6	14.801
7	21 46 52.58	2.0879	13 37 7.9	13.963	7	23 20 56.40	1.8633	1 55 56.8	14.792
8	21 48 57.66	2.0814	13 23 8.6	14.012	8	23 22 48.12	1.8608	1 41 9.6	14.782
9	21 51 2.35	2.0749	13 9 6.5	14.058	9	23 24 39.69	1.8583	1 26 22.9	14.772
10	21 53 6.65	2.0684	12 55 1.6	14.103	10	23 26 31.11	1.8558	1 11 37.0	14.760
11	21 55 10.56	2.0620	12 40 54.1	14.147	11	23 28 22.38	1.8533	0 56 51.7	14.748
12	21 57 14.09	2.0558	12 26 44.1	14.188	12	23 30 13.51	1.8510	0 42 7.2	14.735
13	21 59 17.25	2.0496	12 12 31.6	14.228	13	23 32 4.50	1.8488	0 27 23.5	14.721
14	22 1 20.04	2.0434	11 58 16.7	14.267	14	23 33 55.37	1.8468	S. 0 12 40.7	14.707
15	22 3 22.46	2.0373	11 43 59.5	14.305	15	23 35 46.11	1.8447	N. 0 2 1.3	14.692
16	22 5 24.52	2.0314	11 29 40.1	14.341	16	23 37 36.73	1.8427	0 16 42.3	14.674
17	22 7 26.23	2.0255	11 15 18.6	14.376	17	23 39 27.23	1.8408	0 31 22.2	14.657
18	22 9 27.58	2.0197	11 0 55.0	14.410	18	23 41 17.62	1.8390	0 46 1.1	14.639
19	22 11 28.59	2.0140	10 46 29.4	14.442	19	23 43 7.91	1.8373	1 0 38.9	14.620
20	22 13 29.26	2.0083	10 32 2.0	14.472	20	23 44 58.10	1.8357	1 15 15.5	14.601
21	22 15 29.59	2.0028	10 17 32.8	14.501	21	23 46 48.19	1.8341	1 29 51.0	14.580
22	22 17 29.59	1.9973	10 3 1.9	14.529	22	23 48 38.19	1.8326	1 44 25.1	14.558
23	22 19 29.26	1.9918	S. 9 48 29.3	14.556	23	23 50 28.10	1.8312	N. 1 58 58.0	14.537
	MONDAY 18.					WEDNESDAY 20.			
0	22 21 28.61	1.9866	S. 9 33 55.2	14.581	0	23 52 17.93	1.8299	N. 2 13 29.5	14.513
1	22 23 27.65	1.9813	9 19 19.6	14.605	1	23 54 7.69	1.8287	2 27 59.6	14.490
2	22 25 26.37	1.9761	9 4 42.6	14.627	2	23 55 57.37	1.8275	2 42 28.3	14.465
3	22 27 24.78	1.9711	8 50 4.3	14.648	3	23 57 46.99	1.8264	2 56 55.4	14.440
4	22 29 22.90	1.9661	8 35 24.8	14.669	4	23 59 36.54	1.8253	3 11 21.1	14.415
5	22 31 20.71	1.9612	8 20 44.0	14.688	5	0 1 26.03	1.8244	3 25 45.2	14.387
6	22 33 18.24	1.9564	8 6 2.2	14.706	6	0 3 15.47	1.8236	3 40 7.6	14.360
7	22 35 15.48	1.9517	7 51 19.3	14.722	7	0 5 4.86	1.8228	3 54 28.4	14.332
8	22 37 12.44	1.9470	7 36 35.5	14.737	8	0 6 54.21	1.8222	4 8 47.5	14.303
9	22 39 9.12	1.9424	7 21 50.8	14.752	9	0 8 43.52	1.8215	4 23 4.8	14.273
10	22 41 5.53	1.9379	7 7 5.3	14.765	10	0 10 32.79	1.8210	4 37 20.3	14.243
11	22 43 1.67	1.9335	6 52 19.0	14.777	11	0 12 22.04	1.8206	4 51 34.0	14.212
12	22 44 57.55	1.9292	6 37 32.0	14.788	12	0 14 11.26	1.8202	5 5 45.7	14.179
13	22 46 53.17	1.9250	6 22 44.4	14.797	13	0 16 0.46	1.8198	5 19 55.5	14.147
14	22 48 48.55	1.9209	6 7 56.3	14.806	14	0 17 49.64	1.8197	5 34 3.4	14.114
15	22 50 43.68	1.9168	5 53 7.7	14.812	15	0 19 38.82	1.8196	5 48 9.2	14.080
16	22 52 38.57	1.9128	5 38 18.8	14.819	16	0 21 27.99	1.8194	6 2 13.0	14.046
17	22 54 33.22	1.9089	5 23 29.4	14.825	17	0 23 17.15	1.8194	6 16 14.7	14.011
18	22 56 27.64	1.9051	5 8 39.8	14.828	18	0 25 6.32	1.8195	6 30 14.3	13.975
19	22 58 21.83	1.9014	4 53 50.0	14.832	19	0 26 55.49	1.8196	6 44 11.7	13.937
20	23 0 15.81	1.8978	4 39 0.0	14.834	20	0 28 44.67	1.8198	6 58 6.8	13.900
21	23 2 9.57	1.8943	4 24 9.9	14.835	21	0 30 33.87	1.8202	7 11 59.7	13.862
22	23 4 3.12	1.8908	4 9 19.8	14.836	22	0 32 23.09	1.8205	7 25 50.3	13.823
23	23 5 56.46	1.8873	3 54 29.6	14.835	23	0 34 12.33	1.8210	7 39 38.5	13.783
24	23 7 49.60	1.8841	S. 3 39 39.6	14.832	24	0 36 1.61	1.8216	N. 7 53 24.3	13.743

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 21.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	0 36 1.61	1.8216	N. 7 53 24.3	13.743
1	0 37 50.92	1.8221	8 7 7.7	13.702
2	0 39 40.26	1.8228	8 20 48.6	13.661
3	0 41 29.65	1.8235	8 34 27.0	13.619
4	0 43 19.08	1.8243	8 48 2.9	13.577
5	0 45 8.57	1.8253	9 1 36.2	13.533
6	0 46 58.11	1.8261	9 15 6.0	13.489
7	0 48 47.70	1.8271	9 28 34.9	13.444
8	0 50 37.36	1.8283	9 42 0.2	13.398
9	0 52 27.09	1.8294	9 55 22.7	13.352
10	0 54 16.89	1.8307	10 8 42.4	13.305
11	0 56 6.77	1.8319	10 21 59.3	13.257
12	0 57 56.72	1.8333	10 35 13.3	13.209
13	0 59 46.76	1.8348	10 48 24.4	13.160
14	1 1 36.89	1.8363	11 1 32.5	13.111
15	1 3 27.11	1.8378	11 14 37.7	13.062
16	1 5 17.43	1.8395	11 27 39.9	13.010
17	1 7 7.85	1.8412	11 40 38.9	12.958
18	1 8 58.37	1.8430	11 53 34.9	12.907
19	1 10 49.01	1.8448	12 6 27.7	12.853
20	1 12 39.75	1.8467	12 19 17.3	12.800
21	1 14 30.61	1.8487	12 32 3.7	12.746
22	1 16 21.59	1.8507	12 44 46.8	12.691
23	1 18 12.69	1.8528	N. 12 57 26.6	12.635

FRIDAY 22.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	1 20 3.92	1.8549	N. 13 10 3.0	12.579
1	1 21 55.28	1.8572	13 22 36.1	12.522
2	1 23 46.78	1.8595	13 35 5.7	12.464
3	1 25 38.42	1.8618	13 47 31.8	12.406
4	1 27 30.20	1.8643	13 59 54.4	12.347
5	1 29 22.13	1.8668	14 12 13.5	12.287
6	1 31 14.21	1.8693	14 24 28.9	12.227
7	1 33 6.44	1.8718	14 36 40.7	12.167
8	1 34 58.83	1.8746	14 48 48.9	12.105
9	1 36 51.39	1.8773	15 0 53.3	12.042
10	1 38 44.10	1.8800	15 12 54.0	11.980
11	1 40 36.99	1.8829	15 24 50.9	11.916
12	1 42 30.05	1.8858	15 36 43.9	11.851
13	1 44 23.28	1.8887	15 48 33.0	11.786
14	1 46 16.69	1.8918	16 0 18.2	11.720
15	1 48 10.29	1.8948	16 11 59.4	11.653
16	1 50 4.07	1.8978	16 23 36.6	11.586
17	1 51 58.03	1.9010	16 35 9.7	11.518
18	1 53 52.19	1.9043	16 46 38.8	11.450
19	1 55 46.55	1.9076	16 58 3.7	11.380
20	1 57 41.10	1.9109	17 9 24.4	11.310
21	1 59 35.86	1.9143	17 20 40.9	11.240
22	2 1 30.81	1.9177	17 31 53.2	11.168
23	2 3 25.98	1.9213	17 43 1.1	11.096
24	2 5 21.36	1.9248	N. 17 54 4.7	11.022

SATURDAY 23.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	2 5 21.36	1.9248	N. 17 54 4.7	11.022
1	2 7 16.95	1.9283	18 5 3.8	10.948
2	2 9 12.76	1.9320	18 15 58.5	10.874
3	2 11 8.79	1.9356	18 26 48.7	10.799
4	2 13 5.03	1.9393	18 37 34.4	10.723
5	2 15 1.50	1.9431	18 48 15.5	10.647
6	2 16 58.20	1.9469	18 58 52.0	10.569
7	2 18 55.13	1.9508	19 9 23.8	10.491
8	2 20 52.29	1.9547	19 19 50.9	10.412
9	2 22 49.69	1.9586	19 30 13.2	10.332
10	2 24 47.32	1.9625	19 40 30.7	10.251
11	2 26 45.19	1.9666	19 50 43.3	10.169
12	2 28 43.31	1.9707	20 0 51.0	10.087
13	2 30 41.67	1.9747	20 10 53.8	10.005
14	2 32 40.27	1.9788	20 20 51.6	9.921
15	2 34 39.13	1.9830	20 30 44.3	9.837
16	2 36 38.23	1.9872	20 40 32.0	9.752
17	2 38 37.59	1.9915	20 50 14.5	9.665
18	2 40 37.21	1.9958	20 59 51.8	9.578
19	2 42 37.08	2.0000	21 9 23.9	9.492
20	2 44 37.21	2.0043	21 18 50.8	9.403
21	2 46 37.60	2.0087	21 28 12.3	9.313
22	2 48 38.25	2.0130	21 37 28.4	9.223
23	2 50 39.16	2.0174	N. 21 46 39.1	9.132

SUNDAY 24.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	2 52 40.34	2.0219	N. 21 55 44.3	9.041
1	2 54 41.79	2.0263	22 4 44.0	8.948
2	2 56 43.50	2.0308	22 13 38.1	8.855
3	2 58 45.49	2.0353	22 22 26.6	8.762
4	3 0 47.74	2.0398	22 31 9.5	8.667
5	3 2 50.27	2.0444	22 39 46.6	8.571
6	3 4 53.07	2.0489	22 48 18.0	8.474
7	3 6 56.14	2.0535	22 56 43.5	8.377
8	3 8 59.49	2.0582	23 5 3.2	8.279
9	3 11 3.12	2.0628	23 13 17.0	8.180
10	3 13 7.02	2.0673	23 21 24.8	8.080
11	3 15 11.20	2.0719	23 29 26.6	7.979
12	3 17 15.65	2.0766	23 37 22.3	7.877
13	3 19 20.39	2.0813	23 45 11.9	7.776
14	3 21 25.40	2.0858	23 52 55.4	7.672
15	3 23 30.69	2.0905	24 0 32.6	7.568
16	3 25 36.26	2.0951	24 8 3.6	7.463
17	3 27 42.10	2.0998	24 15 28.2	7.357
18	3 29 48.23	2.1045	24 22 46.5	7.252
19	3 31 54.64	2.1091	24 29 58.4	7.144
20	3 34 1.32	2.1137	24 37 3.8	7.036
21	3 36 8.28	2.1183	24 44 2.7	6.927
22	3 38 15.52	2.1230	24 50 55.1	6.817
23	3 40 23.04	2.1276	24 57 40.8	6.707
24	3 42 30.83	2.1322	N. 25 4 19.9	6.595

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 25.					WEDNESDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 42 30.83	2.1322	N. 25 4 19.9	6.595	0	5 29 33.10	2.3073	N. 27 57 43.5	0.367
1	3 44 38.90	2.1368	25 10 52.2	6.482	1	5 31 51.60	2.3093	27 58 1.2	0.222
2	3 46 47.25	2.1414	25 17 17.8	6.370	2	5 34 10.21	2.3112	27 58 10.2	+0.078
3	3 48 55.87	2.1459	25 23 36.6	6.256	3	5 36 28.94	2.3130	27 58 10.6	−0.067
4	3 51 4.76	2.1505	25 29 48.5	6.141	4	5 38 47.77	2.3148	27 58 2.2	0.212
5	3 53 13.93	2.1551	25 35 53.5	6.025	5	5 41 6.71	2.3165	27 57 45.1	0.358
6	3 55 23.37	2.1595	25 41 51.5	5.908	6	5 43 25.75	2.3181	27 57 19.2	0.504
7	3 57 33.07	2.1640	25 47 42.5	5.792	7	5 45 44.88	2.3196	27 56 44.6	0.650
8	3 59 43.05	2.1685	25 53 26.5	5.673	8	5 48 4.10	2.3210	27 56 1.2	0.797
9	4 1 53.29	2.1729	25 59 3.3	5.555	9	5 50 23.40	2.3223	27 55 9.0	0.944
10	4 4 3.80	2.1773	26 4 33.1	5.436	10	5 52 42.78	2.3235	27 54 7.9	1.092
11	4 6 14.57	2.1817	26 9 55.6	5.314	11	5 55 2.22	2.3246	27 52 58.0	1.238
12	4 8 25.60	2.1861	26 15 10.8	5.193	12	5 57 21.73	2.3257	27 51 39.3	1.386
13	4 10 36.90	2.1904	26 20 18.8	5.072	13	5 59 41.30	2.3266	27 50 11.7	1.534
14	4 12 48.45	2.1947	26 25 19.4	4.948	14	6 2 0.92	2.3274	27 48 35.2	1.682
15	4 15 0.26	2.1989	26 30 12.6	4.825	15	6 4 20.59	2.3282	27 46 49.9	1.829
16	4 17 12.32	2.2031	26 34 58.4	4.701	16	6 6 40.30	2.3289	27 44 55.7	1.977
17	4 19 24.63	2.2073	26 39 36.7	4.576	17	6 9 0.06	2.3295	27 42 52.6	2.126
18	4 21 37.19	2.2114	26 44 7.5	4.450	18	6 11 19.84	2.3298	27 40 40.6	2.274
19	4 23 50.00	2.2155	26 48 30.7	4.322	19	6 13 39.64	2.3303	27 38 19.7	2.422
20	4 26 3.05	2.2195	26 52 46.2	4.195	20	6 15 59.47	2.3306	27 35 50.0	2.570
21	4 28 16.34	2.2234	26 56 54.1	4.067	21	6 18 19.31	2.3308	27 33 11.3	2.719
22	4 30 29.86	2.2273	27 0 54.3	3.938	22	6 20 39.17	2.3309	27 30 23.7	2.867
23	4 32 43.62	2.2313	N. 27 4 46.7	3.809	23	6 22 59.02	2.3308	N. 27 27 27.2	3.016
	TUESDAY 26.					THURSDAY 28.			
0	4 34 57.61	2.2351	N. 27 8 31.4	3.679	0	6 25 18.87	2.3308	N. 27 24 21.8	3.164
1	4 37 11.83	2.2388	27 12 8.2	3.547	1	6 27 38.71	2.3306	27 21 7.5	3.312
2	4 39 26.27	2.2426	27 15 37.1	3.416	2	6 29 58.54	2.3303	27 17 44.3	3.460
3	4 41 40.94	2.2463	27 18 58.1	3.284	3	6 32 18.35	2.3300	27 14 12.3	3.607
4	4 43 55.83	2.2499	27 22 11.2	3.151	4	6 34 38.14	2.3296	27 10 31.4	3.756
5	4 46 10.93	2.2534	27 25 16.2	3.017	5	6 36 57.90	2.3290	27 6 41.6	3.904
6	4 48 26.24	2.2568	27 28 13.2	2.882	6	6 39 17.62	2.3283	27 2 42.9	4.052
7	4 50 41.75	2.2603	27 31 2.1	2.747	7	6 41 37.30	2.3276	26 58 35.4	4.199
8	4 52 57.48	2.2638	27 33 42.9	2.612	8	6 43 56.93	2.3268	26 54 19.0	4.347
9	4 55 13.40	2.2669	27 36 15.6	2.477	9	6 46 16.52	2.3259	26 49 53.8	4.493
10	4 57 29.51	2.2701	27 38 40.1	2.339	10	6 48 36.04	2.3249	26 45 19.8	4.640
11	4 59 45.81	2.2733	27 40 56.3	2.201	11	6 50 55.51	2.3239	26 40 37.0	4.787
12	5 2 2.30	2.2764	27 43 4.2	2.063	12	6 53 14.91	2.3228	26 35 45.4	4.933
13	5 4 18.98	2.2794	27 45 3.9	1.925	13	6 55 34.24	2.3215	26 30 45.0	5.079
14	5 6 35.83	2.2823	27 46 55.2	1.786	14	6 57 53.49	2.3202	26 25 35.9	5.224
15	5 8 52.85	2.2852	27 48 38.2	1.646	15	7 0 12.66	2.3188	26 20 18.1	5.369
16	5 11 10.05	2.2880	27 50 12.7	1.506	16	7 2 31.74	2.3173	26 14 51.6	5.514
17	5 13 27.41	2.2907	27 51 38.9	1.366	17	7 4 50.74	2.3158	26 9 16.4	5.659
18	5 15 44.93	2.2933	27 52 56.6	1.224	18	7 7 9.64	2.3141	26 3 32.5	5.803
19	5 18 2.60	2.2958	27 54 5.8	1.082	19	7 9 28.43	2.3124	25 57 40.0	5.947
20	5 20 20.42	2.2982	27 55 6.5	0.941	20	7 11 47.13	2.3107	25 51 38.9	6.090
21	5 22 38.38	2.3006	27 55 58.6	0.797	21	7 14 5.72	2.3088	25 45 29.2	6.232
22	5 24 56.49	2.3029	27 56 42.2	0.655	22	7 16 24.19	2.3069	25 39 11.0	6.375
23	5 27 14.73	2.3051	27 57 17.2	0.511	23	7 18 42.55	2.3049	25 32 44.2	6.517
24	5 29 33.10	2.3073	N. 27 57 43.5	0.367	24	7 21 0.78	2.3028	N. 25 26 9.0	6.657

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 29.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	7 21 0.78	2.3028	N. 25 26 9.0	6.657
1	7 23 18.89	2.3008	25 19 25.3	6.798
2	7 25 36.87	2.2986	25 12 33.2	6.938
3	7 27 54.72	2.2963	25 5 32.7	7.078
4	7 30 12.43	2.2940	24 58 23.8	7.217
5	7 32 30.00	2.2916	24 51 6.6	7.356
6	7 34 47.42	2.2892	24 43 41.1	7.493
7	7 37 4.70	2.2868	24 36 7.4	7.630
8	7 39 21.83	2.2842	24 28 25.5	7.767
9	7 41 38.80	2.2815	24 20 35.4	7.902
10	7 43 55.61	2.2789	24 12 37.2	8.037
11	7 46 12.27	2.2763	24 4 30.9	8.172
12	7 48 28.76	2.2735	23 56 16.5	8.307
13	7 50 45.09	2.2707	23 47 54.1	8.439
14	7 53 1.24	2.2678	23 39 23.8	8.571
15	7 55 17.22	2.2649	23 30 45.6	8.702
16	7 57 33.03	2.2620	23 21 59.5	8.833
17	7 59 48.66	2.2590	23 13 5.6	8.963
18	8 2 4.11	2.2561	23 4 3.9	9.092
19	8 4 19.39	2.2531	22 54 54.5	9.220
20	8 6 34.48	2.2499	22 45 37.5	9.347
21	8 8 49.38	2.2468	22 36 12.8	9.474
22	8 11 4.10	2.2438	22 26 40.6	9.599
23	8 13 18.63	2.2406	N. 22 17 0.9	9.724

SATURDAY 30.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	8 15 32.97	2.2374	N. 22 7 13.7	9.848
1	8 17 47.12	2.2342	21 57 19.1	9.971
2	8 20 1.07	2.2309	21 47 17.2	10.092
3	8 22 14.83	2.2277	21 37 8.0	10.213
4	8 24 28.39	2.2244	21 26 51.6	10.333
5	8 26 41.76	2.2212	21 16 28.0	10.452
6	8 28 54.93	2.2179	21 5 57.3	10.571
7	8 31 7.91	2.2146	20 55 19.5	10.688
8	8 33 20.68	2.2112	20 44 34.7	10.804
9	8 35 33.25	2.2078	20 33 43.0	10.919
10	8 37 45.62	2.2046	20 22 44.4	11.033
11	8 39 57.80	2.2013	20 11 39.0	11.146
12	8 42 9.77	2.1978	20 0 26.9	11.258
13	8 44 21.54	2.1945	19 49 8.0	11.369
14	8 46 33.11	2.1911	19 37 42.6	11.478
15	8 48 44.47	2.1878	19 26 10.6	11.587
16	8 50 55.64	2.1845	19 14 32.1	11.696
17	8 53 6.61	2.1811	19 2 47.1	11.802
18	8 55 17.37	2.1778	18 50 55.8	11.907
19	8 57 27.94	2.1745	18 38 58.2	12.012
20	8 59 38.31	2.1712	18 26 54.3	12.116
21	9 1 48.48	2.1678	18 14 44.3	12.218
22	9 3 58.45	2.1645	18 2 28.1	12.320
23	9 6 8.22	2.1613	17 50 5.9	12.419
24	9 8 17.80	2.1580	N. 17 37 37.8	12.517

SUNDAY 31.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	9 8 17.80	2.1580	N. 17 37 37.8	12.517
1	9 10 27.18	2.1548	17 25 3.8	12.615
2	9 12 36.37	2.1515	17 12 24.0	12.712
3	9 14 45.36	2.1483	16 59 38.4	12.807
4	9 16 54.17	2.1452	16 46 47.1	12.902
5	9 19 2.78	2.1420	16 33 50.2	12.994
6	9 21 11.21	2.1389	16 20 47.8	13.086
7	9 23 19.45	2.1358	16 7 39.9	13.177
8	9 25 27.50	2.1328	15 54 26.6	13.266
9	9 27 35.38	2.1298	15 41 8.0	13.354
10	9 29 43.07	2.1267	15 27 44.1	13.442
11	9 31 50.58	2.1237	15 14 15.0	13.527
12	9 33 57.91	2.1208	15 0 40.8	13.612
13	9 36 5.07	2.1179	14 47 1.6	13.695
14	9 38 12.06	2.1150	14 33 17.4	13.777
15	9 40 18.87	2.1122	14 19 28.3	13.858
16	9 42 25.52	2.1094	14 5 34.4	13.937
17	9 44 32.00	2.1066	13 51 35.8	14.016
18	9 46 38.31	2.1039	13 37 32.5	14.093
19	9 48 44.47	2.1013	13 23 24.6	14.169
20	9 50 50.47	2.0987	13 9 12.2	14.243
21	9 52 56.31	2.0961	12 54 55.4	14.317
22	9 55 2.00	2.0936	12 40 34.2	14.389
23	9 57 7.54	2.0911	N. 12 26 8.7	14.460

MONDAY, FEBRUARY 1.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	9 59 12.93	2.0887	N. 12 11 39.0	14.529

PHASES OF THE MOON.

			d	h	m
○	Full Moon	Jan.	1	0	20.5
☾	Last Quarter		8	9	12.6
●	New Moon		15	2	41.9
☽	First Quarter		22	17	32.3
○	Full Moon		30	16	41.3

			d	h
☾	Perigee	Jan.	12	2.1
☾	Apogee		23	20.7

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	20 56 7.44	10.214	S.17 19 22.7	+42.09	16 15.76	68.33	13 38.69	0.357
Tues.	2	21 0 12.17	10.180	17 2 23.3	42.85	16 15.61	68.22	13 46.84	0.323
Wed.	3	21 4 16.08	10.146	16 45 5.9	43.59	16 15.46	68.10	13 54.18	0.289
Thur.	4	21 8 19.19	10.113	16 27 31.0	+44.31	16 15.30	67.99	14 0.71	0.256
Fri.	5	21 12 21.49	10.079	16 9 38.8	45.02	16 15.14	67.87	14 6.44	0.223
Sat.	6	21 16 22.99	10.046	15 51 29.9	45.72	16 14.97	67.75	14 11.37	0.190
SUN.	7	21 20 23.71	10.013	15 33 4.5	+46.40	16 14.80	67.64	14 15.52	0.157
Mon.	8	21 24 23.64	9.981	15 14 23.1	47.05	16 14.62	67.52	14 18.88	0.124
Tues.	9	21 28 22.78	9.948	14 55 26.1	47.69	16 14.44	67.41	14 21.46	0.092
Wed.	10	21 32 21.14	9.916	14 36 14.0	+48.31	16 14.26	67.30	14 23.26	0.060
Thur.	11	21 36 18.74	9.884	14 16 47.1	48.91	16 14.07	67.19	14 24.30	0.028
Fri.	12	21 40 15.56	9.852	13 57 5.9	49.50	16 13.88	67.08	14 24.57	0.004
Sat.	13	21 44 11.63	9.820	13 37 10.9	+50.07	16 13.69	66.97	14 24.08	0.036
SUN.	14	21 48 6.94	9.789	13 17 2.4	50.62	16 13.50	66.86	14 22.84	0.067
Mon.	15	21 52 1.50	9.758	12 56 41.0	51.15	16 13.31	66.76	14 20.84	0.098
Tues.	16	21 55 55.31	9.727	12 36 7.1	+51.66	16 13.12	66.65	14 18.11	0.129
Wed.	17	21 59 48.39	9.697	12 15 21.1	52.16	16 12.92	66.55	14 14.64	0.159
Thur.	18	22 3 40.74	9.667	11 54 23.5	52.64	16 12.71	66.45	14 10.46	0.189
Fri.	19	22 7 32.38	9.637	11 33 14.6	+53.10	16 12.50	66.35	14 5.55	0.218
Sat.	20	22 11 23.33	9.608	11 11 55.0	53.54	16 12.29	66.25	13 59.96	0.247
SUN.	21	22 15 13.58	9.580	10 50 25.0	53.96	16 12.08	66.15	13 53.67	0.275
Mon.	22	22 19 3.16	9.552	10 28 45.1	+54.36	16 11.87	66.06	13 46.72	0.303
Tues.	23	22 22 52.08	9.525	10 6 55.7	54.75	16 11.66	65.97	13 39.10	0.330
Wed.	24	22 26 40.36	9.499	9 44 57.1	55.12	16 11.44	65.88	13 30.85	0.356
Thur.	25	22 30 28.01	9.473	9 22 49.8	+55.48	16 11.21	65.79	13 21.98	0.382
Fri.	26	22 34 15.06	9.448	9 0 34.2	55.82	16 10.99	65.71	13 12.49	0.407
Sat.	27	22 38 1.52	9.424	8 38 10.7	56.14	16 10.76	65.63	13 2.42	0.431
SUN.	28	22 41 47.40	9.401	8 15 39.5	56.45	16 10.53	65.55	12 51.79	0.454
Mon.	29	22 45 32.75	9.379	S. 7 53 1.2	+56.74	16 10.29	65.47	12 40.60	0.476

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting $0^s.19$ from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	20 56 5.12	10.213	S. 17 19 32.2	+42.08	13 38.61	0.357	20 42 26.51
Tues.	2	21 0 9.83	10.179	17 2 33.1	42.84	13 46.76	0.323	20 46 23.07
Wed.	3	21 4 13.73	10.146	16 45 16.0	43.58	13 54.11	0.289	20 50 19.62
Thur.	4	21 8 16.83	10.112	16 27 41.3	+44.30	14 0.65	0.256	20 54 16.18
Fri.	5	21 12 19.12	10.079	16 9 49.4	45.01	14 6.38	0.223	20 58 12.74
Sat.	6	21 16 20.62	10.046	15 51 40.7	45.70	14 11.32	0.190	21 2 9.29
SUN.	7	21 20 21.33	10.013	15 33 15.5	+46.38	14 15.48	0.157	21 6 5.85
Mon.	8	21 24 21.25	9.981	15 14 34.3	47.04	14 18.85	0.124	21 10 2.40
Tues.	9	21 28 20.40	9.948	14 55 37.5	47.68	14 21.44	0.092	21 13 58.96
Wed.	10	21 32 18.76	9.916	14 36 25.6	+48.30	14 23.25	0.060	21 17 55.52
Thur.	11	21 36 16.36	9.884	14 16 58.8	48.91	14 24.29	0.028	21 21 52.07
Fri.	12	21 40 13.20	9.852	13 57 17.8	49.50	14 24.57	0.004	21 25 48.63
Sat.	13	21 44 9.27	9.821	13 37 22.9	+50.07	14 24.09	0.036	21 29 45.18
SUN.	14	21 48 4.59	9.789	13 17 14.5	50.62	14 22.85	0.067	21 33 41.74
Mon.	15	21 51 59.16	9.758	12 56 53.2	51.15	14 20.87	0.098	21 37 38.29
Tues.	16	21 55 52.99	9.728	12 36 19.4	+51.66	14 18.14	0.129	21 41 34.85
Wed.	17	21 59 46.09	9.697	12 15 33.5	52.16	14 14.68	0.159	21 45 31.40
Thur.	18	22 3 38.46	9.667	11 54 35.9	52.63	14 10.50	0.189	21 49 27.96
Fri.	19	22 7 30.12	9.638	11 33 27.1	+53.09	14 5.61	0.218	21 53 24.51
Sat.	20	22 11 21.08	9.609	11 12 7.5	53.54	14 0.02	0.247	21 57 21.07
SUN.	21	22 15 11.36	9.581	10 50 37.5	53.96	13 53.74	0.275	22 1 17.62
Mon.	22	22 19 0.96	9.553	10 28 57.6	+54.36	13 46.79	0.303	22 5 14.18
Tues.	23	22 22 49.91	9.526	10 7 8.1	54.75	13 39.18	0.330	22 9 10.73
Wed.	24	22 26 38.22	9.500	9 45 9.5	55.12	13 30.93	0.356	22 13 7.29
Thur.	25	22 30 25.90	9.474	9 23 2.2	+55.48	13 22.06	0.382	22 17 3.84
Fri.	26	22 34 12.98	9.449	9 0 46.5	55.82	13 12.58	0.407	22 21 0.40
Sat.	27	22 37 59.47	9.425	8 38 22.9	56.14	13 2.52	0.431	22 24 56.95
SUN.	28	22 41 45.39	9.402	8 15 51.6	56.45	12 51.88	0.454	22 28 53.50
Mon.	29	22 45 30.76	9.380	S. 7 53 13.2	+56.74	12 40.70	0.476	22 32 50.06

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

Diff. for 1 Hour, +9ˢ.8565. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S							Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.		
		True Longitude.					Diff. for 1 Hour.	Latitude.					
		λ			λ′								
		°	′	″	′	″	″	″			h	m	s
1	32	311	33	54.5	33	39.8	152.18	+0.03	9.993 6068	+26.8	3	17	1.12
2	33	312	34	46.4	34	31.5	152.14	−0.09	9.993 6723	27.8	3	13	5.21
3	34	313	35	37.3	35	22.3	152.10	0.22	9.993 7403	28.8	3	9	9.30
4	35	314	36	27.3	36	12.1	152.06	−0.33	9.993 8107	+29.8	3	5	13.39
5	36	315	37	16.3	37	1.0	152.03	0.42	9.993 8834	30.7	3	1	17.48
6	37	316	38	4.5	37	49.0	151.99	0.49	9.993 9581	31.5	2	57	21.57
7	38	317	38	51.8	38	36.2	151.95	−0.52	9.994 0348	+32.3	2	53	25.66
8	39	318	39	38.1	39	22.3	151.91	0.51	9.994 1132	33.0	2	49	29.75
9	40	319	40	23.4	40	7.5	151.87	0.48	9.994 1933	33.6	2	45	33.84
10	41	320	41	7.7	40	51.6	151.82	−0.41	9.994 2747	+34.2	2	41	37.93
11	42	321	41	50.9	41	34.7	151.77	0.31	9.994 3575	34.7	2	37	42.02
12	43	322	42	32.9	42	16.5	151.72	0.20	9.994 4414	35.2	2	33	46.11
13	44	323	43	13.6	42	57.1	151.66	−0.07	9.994 5264	+35.6	2	29	50.20
14	45	324	43	52.9	43	36.3	151.60	+0.08	9.994 6125	36.1	2	25	54.29
15	46	325	44	30.8	44	14.0	151.54	0.21	9.994 6995	36.5	2	21	58.38
16	47	326	45	7.1	44	50.2	151.48	+0.34	9.994 7876	+36.9	2	18	2.48
17	48	327	45	41.8	45	24.7	151.41	0.45	9.994 8766	37.4	2	14	6.57
18	49	328	46	14.7	45	57.5	151.34	0.55	9.994 9668	37.8	2	10	10.66
19	50	329	46	45.9	46	28.6	151.26	+0.63	9.995 0582	+38.3	2	6	14.75
20	51	330	47	15.3	46	57.8	151.19	0.67	9.995 1507	38.8	2	2	18.84
21	52	331	47	42.8	47	25.2	151.11	0.69	9.995 2446	39.4	1	58	22.93
22	53	332	48	8.4	47	50.7	151.03	+0.67	9.995 3398	+40.0	1	54	27.02
23	54	333	48	32.1	48	14.3	150.95	0.63	9.995 4363	40.6	1	50	31.11
24	55	334	48	53.9	48	36.0	150.87	0.56	9.995 5344	41.2	1	46	35.20
25	56	335	49	13.8	48	55.7	150.79	+0.47	9.995 6340	+41.8	1	42	39.29
26	57	336	49	31.7	49	13.5	150.72	0.36	9.995 7353	42.5	1	38	43.39
27	58	337	49	47.7	49	29.4	150.64	0.23	9.995 8382	43.2	1	34	47.48
28	59	338	50	1.8	49	43.4	150.56	+0.10	9.995 9429	44.0	1	30	51.57
29	60	339	50	14.0	49	55.5	150.48	−0.03	9.996 0493	+44.8	1	26	55.66

Note.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,
$-9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 46.0	15 49.9	57 45.91	+1.250	58 0.31	+1.149	13 43.0	1.95	16.9
2	15 53.5	15 56.7	58 13.45	1.040	58 25.26	0.928	14 29.6	1.94	17.9
3	15 59.5	16 2.0	58 35.71	0.814	58 44.79	0.700	15 16.4	1.97	18.9
4	16 4.1	16 5.9	58 52.52	+0.589	58 58.95	+0.484	16 4.5	2.05	19.9
5	16 7.3	16 8.4	59 4.15	0.383	59 8.16	0.286	16 55.3	2.19	20.9
6	16 9.2	16 9.6	59 11.02	0.192	59 12.77	+0.101	17 49.7	2.35	21.9
7	16 9.8	16 9.7	59 13.44	+0.010	59 13.00	−0.084	18 48.0	2.50	22.9
8	16 9.3	16 8.5	59 11.41	−0.182	59 8.62	0.285	19 49.4	2.59	23.9
9	16 7.4	16 5.9	59 4.55	0.395	58 59.12	0.512	20 51.7	2.58	24.9
10	16 4.0	16 1.8	58 52.25	−0.635	58 43.87	−0.762	21 52.3	2.45	25.9
11	15 59.1	15 55.9	58 33.95	0.891	58 22.49	1.018	22 49.2	2.28	26.9
12	15 52.4	15 48.5	58 9.53	1.140	57 55.16	1.253	23 41.6	2.09	27.9
13	15 44.2	15 39.7	57 39.51	−1.353	57 22.76	−1.435	☌	. .	28.9
14	15 34.9	15 29.9	57 5.16	1.495	56 46.97	1.533	0 29.7	1.92	0.3
15	15 24.9	15 19.8	56 28.48	1.545	56 10.01	1.529	1 14.5	1.81	1.3
16	15 14.9	15 10.1	55 51.89	−1.486	55 34.45	−1.416	1 57.1	1.75	2.3
17	15 5.7	15 1.6	55 18.01	1.320	55 2.86	1.202	2 38.7	1.72	3.3
18	14 57.8	14 54.6	54 49.26	1.061	54 37.48	0.899	3 20.3	1.75	4.3
19	14 52.0	14 50.0	54 27.76	−0.718	54 20.30	−0.523	4 3.0	1.81	5.3
20	14 48.6	14 47.9	54 15.23	−0.319	54 12.67	−0.106	4 47.5	1.90	6.3
21	14 47.9	14 48.6	54 12.70	+0.112	54 15.38	+0.335	5 34.5	2.01	7.3
22	14 50.1	14 52.2	54 20.73	+0.556	54 28.70	+0.772	6 24.1	2.12	8.3
23	14 55.1	14 58.6	54 39.22	0.980	54 52.18	1.177	7 15.9	2.19	9.3
24	15 2.8	15 7.5	55 7.41	1.358	55 24.70	1.520	8 9.0	2.22	10.3
25	15 12.7	15 18.3	55 43.79	+1.658	56 4.38	+1.769	9 2.2	2.21	11.3
26	15 24.2	15 30.4	56 26.13	1.850	56 48.64	1.896	9 54.4	2.14	12.3
27	15 36.6	15 42.8	57 11.48	1.905	57 34.21	1.876	10 44.9	2.08	13.3
28	15 48.8	15 54.6	57 56.35	1.807	58 17.44	1.702	11 34.0	2.02	14.3
29	15 59.9	16 4.7	58 37.05	+1.561	58 54.78	+1.388	12 22.0	1.99	15.3

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 1.					WEDNESDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 59 12.93	2.0887	N. 12 11 39.0	14.529	0	11 37 49.49	2.0468	S. 0 21 1.0	16.318
1	10 1 18.18	2.0863	11 57 5.2	14.598	1	11 39 52.32	2.0477	0 37 20.2	16.322
2	10 3 23.28	2.0839	11 42 27.3	14.665	2	11 41 55.21	2.0488	0 53 39.6	16.324
3	10 5 28.25	2.0818	11 27 45.4	14.731	3	11 43 58.17	2.0499	1 9 59.1	16.325
4	10 7 33.09	2.0795	11 12 59.6	14.795	4	11 46 1.20	2.0511	1 26 18.6	16.324
5	10 9 37.79	2.0773	10 58 10.0	14.858	5	11 48 4.30	2.0523	1 42 38.0	16.323
6	10 11 42.36	2.0752	10 43 16.7	14.919	6	11 50 7.47	2.0536	1 58 57.3	16.320
7	10 13 46.81	2.0732	10 28 19.7	14.980	7	11 52 10.73	2.0551	2 15 16.4	16.316
8	10 15 51.14	2.0712	10 13 19.1	15.040	8	11 54 14.08	2.0566	2 31 35.2	16.310
9	10 17 55.35	2.0692	9 58 14.9	15.098	9	11 56 17.52	2.0582	2 47 53.6	16.303
10	10 19 59.44	2.0673	9 43 7.3	15.154	10	11 58 21.06	2.0599	3 4 11.5	16.293
11	10 22 3.42	2.0655	9 27 56.4	15.209	11	12 0 24.71	2.0617	3 20 28.8	16.283
12	10 24 7.30	2.0638	9 12 42.2	15.263	12	12 2 28.46	2.0635	3 36 45.5	16.272
13	10 26 11.07	2.0620	8 57 24.8	15.317	13	12 4 32.33	2.0654	3 53 1.4	16.258
14	10 28 14.74	2.0604	8 42 4.2	15.368	14	12 6 36.31	2.0674	4 9 16.5	16.244
15	10 30 18.32	2.0588	8 26 40.6	15.418	15	12 8 40.42	2.0695	4 25 30.7	16.228
16	10 32 21.80	2.0573	8 11 14.1	15.466	16	12 10 44.65	2.0717	4 41 43.9	16.212
17	10 34 25.20	2.0559	7 55 44.7	15.514	17	12 12 49.02	2.0739	4 57 56.1	16.193
18	10 36 28.51	2.0545	7 40 12.4	15.561	18	12 14 53.52	2.0763	5 14 7.1	16.173
19	10 38 31.74	2.0532	7 24 37.4	15.605	19	12 16 58.17	2.0787	5 30 16.8	16.150
20	10 40 34.89	2.0519	7 8 59.8	15.648	20	12 19 2.96	2.0812	5 46 25.1	16.127
21	10 42 37.97	2.0508	6 53 19.6	15.691	21	12 21 7.91	2.0838	6 2 32.0	16.103
22	10 44 40.98	2.0497	6 37 36.9	15.732	22	12 23 13.02	2.0865	6 18 37.4	16.078
23	10 46 43.93	2.0487	N. 6 21 51.8	15.771	23	12 25 18.29	2.0893	S. 6 34 41.3	16.050
	TUESDAY 2.					THURSDAY 4.			
0	10 48 46.82	2.0477	N. 6 6 4.4	15.809	0	12 27 23.73	2.0921	S. 6 50 43.4	16.020
1	10 50 49.65	2.0468	5 50 14.7	15.846	1	12 29 29.34	2.0950	7 6 43.7	15.990
2	10 52 52.43	2.0459	5 34 22.9	15.881	2	12 31 35.13	2.0980	7 22 42.2	15.958
3	10 54 55.16	2.0452	5 18 29.0	15.915	3	12 33 41.10	2.1011	7 38 38.7	15.925
4	10 56 57.85	2.0445	5 2 33.1	15.948	4	12 35 47.26	2.1043	7 54 33.2	15.890
5	10 59 0.50	2.0439	4 46 35.3	15.979	5	12 37 53.61	2.1075	8 10 25.5	15.853
6	11 1 3.12	2.0434	4 30 35.6	16.009	6	12 40 0.16	2.1108	8 26 15.6	15.816
7	11 3 5.71	2.0429	4 14 34.2	16.038	7	12 42 6.91	2.1143	8 42 3.4	15.777
8	11 5 8.27	2.0425	3 58 31.1	16.065	8	12 44 13.87	2.1178	8 57 48.8	15.736
9	11 7 10.81	2.0422	3 42 26.4	16.092	9	12 46 21.04	2.1213	9 13 31.7	15.693
10	11 9 13.33	2.0419	3 26 20.1	16.117	10	12 48 28.43	2.1250	9 29 12.0	15.649
11	11 11 15.84	2.0418	3 10 12.4	16.139	11	12 50 36.04	2.1288	9 44 49.6	15.603
12	11 13 18.34	2.0417	2 54 3.4	16.161	12	12 52 43.88	2.1326	10 0 24.4	15.557
13	11 15 20.84	2.0417	2 37 53.1	16.182	13	12 54 51.95	2.1364	10 15 56.4	15.508
14	11 17 23.34	2.0418	2 21 41.6	16.201	14	12 57 0.25	2.1403	10 31 25.4	15.458
15	11 19 25.85	2.0419	2 5 29.0	16.219	15	12 59 8.79	2.1444	10 46 51.4	15.408
16	11 21 28.37	2.0421	1 49 15.3	16.236	16	13 1 17.58	2.1485	11 2 14.3	15.354
17	11 23 30.90	2.0424	1 33 0.7	16.250	17	13 3 26.61	2.1527	11 17 33.9	15.299
18	11 25 33.46	2.0428	1 16 45.3	16.263	18	13 5 35.90	2.1570	11 32 50.2	15.243
19	11 27 36.04	2.0433	1 0 29.1	16.277	19	13 7 45.45	2.1613	11 48 3.1	15.185
20	11 29 38.65	2.0438	0 44 12.1	16.288	20	13 9 55.26	2.1657	12 3 12.4	15.126
21	11 31 41.30	2.0444	0 27 54.5	16.297	21	13 12 5.33	2.1702	12 18 18.2	15.066
22	11 33 43.98	2.0451	N. 0 11 36.5	16.305	22	13 14 15.68	2.1747	12 33 20.3	15.003
23	11 35 46.71	2.0459	S. 0 4 42.1	16.313	23	13 16 26.30	2.1793	12 48 18.5	14.938
24	11 37 49.49	2.0468	S. 0 21 1.0	16.318	24	13 18 37.20	2.1841	S. 13 3 12.9	14.873

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 5.					SUNDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 18 37.20	2.1841	S. 13 3 12.9	14.873	0	15 9 52.06	2.4628	S. 23 11 8.0	9.833
1	13 20 48.39	2.1888	13 18 3.3	14.807	1	15 12 20.01	2.4689	23 20 53.7	9.689
2	13 22 59.86	2.1937	13 32 49.7	14.738	2	15 14 48.33	2.4749	23 30 30.7	9.543
3	13 25 11.63	2.1986	13 47 31.9	14.668	3	15 17 17.00	2.4808	23 39 58.8	9.395
4	13 27 23.69	2.2034	14 2 9.8	14.596	4	15 19 46.03	2.4868	23 49 18.1	9.247
5	13 29 36.05	2.2084	14 16 43.4	14.523	5	15 22 15.41	2.4927	23 58 28.4	9.097
6	13 31 48.71	2.2136	14 31 12.5	14.448	6	15 24 45.15	2.4986	24 7 29.7	8.945
7	13 34 1.68	2.2188	14 45 37.1	14.371	7	15 27 15.24	2.5043	24 16 21.8	8.792
8	13 36 14.96	2.2240	14 59 57.0	14.293	8	15 29 45.67	2.5100	24 25 4.7	8.638
9	13 38 28.56	2.2293	15 14 12.2	14.213	9	15 32 16.44	2.5157	24 33 38.3	8.482
10	13 40 42.47	2.2346	15 28 22.6	14.132	10	15 34 47.55	2.5213	24 42 2.5	8.324
11	13 42 56.71	2.2400	15 42 28.0	14.048	11	15 37 19.00	2.5269	24 50 17.2	8.165
12	13 45 11.27	2.2454	15 56 28.4	13.964	12	15 39 50.78	2.5323	24 58 22.3	8.005
13	13 47 26.16	2.2509	16 10 23.7	13.878	13	15 42 22.88	2.5378	25 6 17.8	7.843
14	13 49 41.38	2.2565	16 24 13.7	13.789	14	15 44 55.31	2.5432	25 14 3.5	7.681
15	13 51 56.94	2.2622	16 37 58.4	13.700	15	15 47 28.06	2.5483	25 21 39.5	7.518
16	13 54 12.84	2.2678	16 51 37.7	13.609	16	15 50 1.11	2.5535	25 29 5.6	7.352
17	13 56 29.08	2.2735	17 5 11.5	13.517	17	15 52 34.48	2.5586	25 36 21.7	7.184
18	13 58 45.66	2.2793	17 18 39.7	13.422	18	15 55 8.14	2.5635	25 43 27.7	7.016
19	14 1 2.59	2.2851	17 32 2.1	13.325	19	15 57 42.10	2.5684	25 50 23.6	6.848
20	14 3 19.87	2.2909	17 45 18.7	13.228	20	16 0 16.35	2.5733	25 57 9.4	6.678
21	14 5 37.50	2.2968	17 58 29.5	13.130	21	16 2 50.89	2.5780	26 3 45.0	6.507
22	14 7 55.48	2.3027	18 11 34.3	13.028	22	16 5 25.71	2.5826	26 10 10.2	6.333
23	14 10 13.82	2.3087	S. 18 24 32.9	12.925	23	16 8 0.80	2.5870	S. 26 16 25.0	6.160
	SATURDAY 6.					MONDAY 8.			
0	14 12 32.52	2.3147	S. 18 37 25.3	12.821	0	16 10 36.15	2.5914	S. 26 22 29.4	5.986
1	14 14 51.58	2.3207	18 50 11.4	12.715	1	16 13 11.77	2.5957	26 28 23.3	5.809
2	14 17 11.00	2.3268	19 2 51.1	12.608	2	16 15 47.64	2.5998	26 34 6.5	5.632
3	14 19 30.79	2.3328	19 15 24.3	12.499	3	16 18 23.75	2.6038	26 39 39.1	5.454
4	14 21 50.94	2.3388	19 27 51.0	12.388	4	16 21 0.10	2.6078	26 45 1.0	5.276
5	14 24 11.46	2.3451	19 40 10.9	12.275	5	16 23 36.68	2.6115	26 50 12.2	5.096
6	14 26 32.35	2.3513	19 52 24.0	12.162	6	16 26 13.48	2.6152	26 55 12.5	4.915
7	14 28 53.61	2.3574	20 4 30.3	12.046	7	16 28 50.50	2.6188	27 0 2.0	4.733
8	14 31 15.24	2.3636	20 16 29.5	11.928	8	16 31 27.73	2.6221	27 4 40.5	4.551
9	14 33 37.24	2.3698	20 28 21.7	11.810	9	16 34 5.15	2.6253	27 9 8.1	4.368
10	14 35 59.61	2.3760	20 40 6.7	11.689	10	16 36 42.77	2.6285	27 13 24.7	4.184
11	14 38 22.36	2.3823	20 51 44.4	11.567	11	16 39 20.57	2.6314	27 17 30.2	3.999
12	14 40 45.48	2.3885	21 3 14.7	11.443	12	16 41 58.54	2.6343	27 21 24.6	3.813
13	14 43 8.98	2.3948	21 14 37.5	11.318	13	16 44 36.68	2.6369	27 25 7.8	3.628
14	14 45 32.85	2.4009	21 25 52.8	11.191	14	16 47 14.97	2.6394	27 28 39.9	3.441
15	14 47 57.09	2.4072	21 37 0.4	11.063	15	16 49 53.41	2.6418	27 32 0.7	3.253
16	14 50 21.71	2.4135	21 48 0.3	10.932	16	16 52 31.99	2.6441	27 35 10.3	3.066
17	14 52 46.71	2.4198	21 58 52.2	10.799	17	16 55 10.70	2.6462	27 38 8.6	2.878
18	14 55 12.08	2.4259	22 9 36.2	10.667	18	16 57 49.53	2.6481	27 40 55.6	2.688
19	14 57 37.82	2.4321	22 20 12.2	10.532	19	17 0 28.47	2.6498	27 43 31.2	2.499
20	15 0 3.93	2.4383	22 30 40.0	10.395	20	17 3 7.50	2.6513	27 45 55.5	2.310
21	15 2 30.41	2.4444	22 40 59.6	10.258	21	17 5 46.63	2.6528	27 48 8.4	2.119
22	15 4 57.26	2.4506	22 51 10.9	10.118	22	17 8 25.84	2.6541	27 50 9.8	1.928
23	15 7 24.48	2.4567	23 1 13.7	9.976	23	17 11 5.12	2.6552	27 51 59.8	1.738
24	15 9 52.06	2.4628	S. 23 11 8.0	9.833	24	17 13 44.46	2.6561	S. 27 53 38.3	1.546

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 9.					THURSDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 13 44.46	2.6561	S. 27 53 38.3	1.546	0	19 19 11.37	2.5139	S. 25 32 26.8	7.156
1	17 16 23.85	2.6568	27 55 5.3	1.355	1	19 21 42.02	2.5078	25 25 12.7	7.313
2	17 19 3.28	2.6575	27 56 20.9	1.164	2	19 24 12.30	2.5015	25 17 49.2	7.468
3	17 21 42.75	2.6579	27 57 25.0	0.973	3	19 26 42.20	2.4953	25 10 16.5	7.623
4	17 24 22.23	2.6582	27 58 17.6	0.781	4	19 29 11.73	2.4889	25 2 34.5	7.776
5	17 27 1.73	2.6583	27 58 58.7	0.588	5	19 31 40.87	2.4824	24 54 43.4	7.926
6	17 29 41.23	2.6582	27 59 28.2	0.397	6	19 34 9.62	2.4759	24 46 43.3	8.076
7	17 32 20.71	2.6579	27 59 46.3	0.206	7	19 36 37.98	2.4694	24 38 34.3	8.224
8	17 35 0.18	2.6576	27 59 52.9	−0.014	8	19 39 5.95	2.4628	24 30 16.4	8.371
9	17 37 39.62	2.6570	27 59 48.0	+0.178	9	19 41 33.52	2.4561	24 21 49.8	8.516
10	17 40 19.02	2.6562	27 59 31.6	0.369	10	19 44 0.68	2.4493	24 13 14.5	8.659
11	17 42 58.36	2.6553	27 59 3.7	0.561	11	19 46 27.43	2.4424	24 4 30.7	8.801
12	17 45 37.65	2.6543	27 58 24.3	0.752	12	19 48 53.77	2.4356	23 55 38.4	8.942
13	17 48 16.87	2.6529	27 57 33.5	0.943	13	19 51 19.70	2.4287	23 46 37.7	9.080
14	17 50 56.00	2.6514	27 56 31.2	1.133	14	19 53 45.21	2.4218	23 37 28.8	9.217
15	17 53 35.04	2.6498	27 55 17.5	1.323	15	19 56 10.31	2.4148	23 28 11.7	9.352
16	17 56 13.98	2.6481	27 53 52.4	1.513	16	19 58 34.99	2.4078	23 18 46.6	9.485
17	17 58 52.81	2.6461	27 52 16.0	1.702	17	20 0 59.24	2 4007	23 9 13.5	9.618
18	18 1 31.51	2.6440	27 50 28.2	1.891	18	20 3 23.07	2.3936	22 59 32.5	9.748
19	18 4 10.09	2.6418	27 48 29.1	2.079	19	20 5 46.47	2.3865	22 49 43.7	9.877
20	18 6 48.53	2.6393	27 46 18.7	2.267	20	20 8 9.45	2.3794	22 39 47.3	10.003
21	18 9 26.81	2.6367	27 43 57.1	2.453	21	20 10 32.00	2 3723	22 29 43.3	10.128
22	18 12 4.93	2.6340	27 41 24.3	2.639	22	20 12 54.12	2.3651	22 19 31.9	10.252
23	18 14 42.89	2.6312	S. 27 38 40.3	2.826	23	20 15 15.81	2.3579	S. 22 9 13.1	10.374
	WEDNESDAY 10.					FRIDAY 12.			
0	18 17 20.67	2.6281	S. 27 35 45.2	3.011	0	20 17 37.07	2.3508	S. 21 58 47.0	10.494
1	18 19 58.26	2.6248	27 32 39.0	3.195	1	20 19 57.90	2.3435	21 48 13.8	10.613
2	18 22 35.65	2.6214	27 29 21.8	3.379	2	20 22 18.29	2.3363	21 37 33.5	10.729
3	18 25 12.83	2.6178	27 25 53.5	3.562	3	20 24 38.25	2.3291	21 26 46.3	10.843
4	18 27 49.79	2.6142	27 22 14.3	3.743	4	20 26 57.78	2.3218	21 15 52.3	10.957
5	18 30 26.53	2.6103	27 18 24.3	3.924	5	20 29 16.87	2.3146	21 4 51.5	11.069
6	18 33 3.03	2.6064	27 14 23.4	4.105	6	20 31 35.53	2.3074	20 53 44.0	11.179
7	18 35 39.30	2.6024	27 10 11.7	4.284	7	20 33 53.76	2.3002	20 42 30.0	11.287
8	18 38 15.32	2.5981	27 5 49.3	4.463	8	20 36 11.55	2.2930	20 31 9.6	11.393
9	18 40 51.07	2.5937	27 1 16.2	4.640	9	20 38 28.92	2.2858	20 19 42.9	11.498
10	18 43 26.56	2.5893	26 56 32.5	4.816	10	20 40 45.85	2.2787	20 8 9.9	11.601
11	18 46 1.78	2.5847	26 51 38.3	4.991	11	20 43 2.36	2.2715	19 56 30.8	11.703
12	18 48 36.72	2.5798	26 46 33.6	5.165	12	20 45 18.43	2.2643	19 44 45.6	11.802
13	18 51 11.36	2.5749	26 41 18.5	5.338	13	20 47 34.08	2.2573	19 32 54.6	11.899
14	18 53 45.71	2.5699	26 35 53.1	5.509	14	20 49 49.30	2.2502	19 20 57.7	11.996
15	18 56 19.75	2.5648	26 30 17.4	5.680	15	20 52 4.10	2.2432	19 8 55.1	12.090
16	18 58 53.48	2.5595	26 24 31.5	5.849	16	20 54 18.48	2.2361	18 56 46.9	12.183
17	19 1 26.89	2.5542	26 18 35.5	6.017	17	20 56 32.43	2.2290	18 44 33.2	12.274
18	19 3 59.98	2.5488	26 12 29.5	6.183	18	20 58 45.96	2.2221	18 32 14.0	12.363
19	19 6 32.74	2.5432	26 6 13.5	6.349	19	21 0 59.08	2.2152	18 19 49.6	12.451
20	19 9 5.16	2.5375	25 59 47.6	6.513	20	21 3 11.78	2.2083	18 7 19.9	12.538
21	19 11 37.24	2.5318	25 53 11.9	6.676	21	21 5 24.07	2.2014	17 54 45.1	12.622
22	19 14 8.97	2.5259	25 46 26.5	6.838	22	21 7 35.95	2.1945	17 42 5.3	12.704
23	19 16 40.35	2.5200	25 39 31.4	6.998	23	21 9 47.41	2.1877	17 29 20.6	12.785
24	19 19 11.37	2.5139	S. 25 32 26.8	7.156	24	21 11 58.47	2.1810	S. 17 16 31.1	12.864

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 13.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	21 11 58.47	2.1810	S. 17 16 31.1	12.864
1	21 14 9.13	2.1743	17 3 36.9	12.942
2	21 16 19.38	2.1676	16 50 38.1	13.018
3	21 18 29.24	2.1611	16 37 34.7	13.093
4	21 20 38.71	2.1545	16 24 26.9	13.166
5	21 22 47.78	2.1479	16 11 14.8	13.237
6	21 24 56.46	2.1414	15 57 58.5	13.306
7	21 27 4.75	2.1350	15 44 38.1	13.374
8	21 29 12.66	2.1287	15 31 13.6	13.442
9	21 31 20.19	2.1223	15 17 45.1	13.507
10	21 33 27.34	2.1161	15 4 12.8	13.569
11	21 35 34.12	2.1099	14 50 36.8	13.631
12	21 37 40.53	2.1038	14 36 57.1	13.692
13	21 39 46.57	2.0977	14 23 13.8	13.750
14	21 41 52.25	2.0917	14 9 27.1	13.807
15	21 43 57.57	2.0858	13 55 37.0	13.863
16	21 46 2.54	2.0798	13 41 43.6	13.917
17	21 48 7.15	2.0740	13 27 47.0	13.969
18	21 50 11.42	2.0683	13 13 47.3	14.020
19	21 52 15.34	2.0625	12 59 44.6	14.070
20	21 54 18.92	2.0568	12 45 38.9	14.118
21	21 56 22.16	2.0513	12 31 30.4	14.165
22	21 58 25.07	2.0458	12 17 19.1	14.211
23	22 0 27.65	2.0403	S. 12 3 5.1	14.254

SUNDAY 14.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	22 2 29.91	2.0350	S. 11 48 48.6	14.296
1	22 4 31.85	2.0297	11 34 29.6	14.338
2	22 6 33.47	2.0244	11 20 8.1	14.378
3	22 8 34.78	2.0193	11 5 44.3	14.415
4	22 10 35.79	2.0143	10 51 18.3	14.452
5	22 12 36.49	2.0092	10 36 50.1	14.488
6	22 14 36.89	2.0042	10 22 19.8	14.522
7	22 16 36.99	1.9993	10 7 47.5	14.554
8	22 18 36.80	1.9945	9 53 13.3	14.586
9	22 20 36.33	1.9898	9 38 37.2	14.616
10	22 22 35.57	1.9851	9 23 59.4	14.644
11	22 24 34.54	1.9805	9 9 19.9	14.672
12	22 26 33.23	1.9759	8 54 38.8	14.698
13	22 28 31.65	1.9715	8 39 56.2	14.723
14	22 30 29.81	1.9672	8 25 12.1	14.747
15	22 32 27.71	1.9628	8 10 26.6	14.768
16	22 34 25.35	1.9586	7 55 39.9	14.789
17	22 36 22.74	1.9545	7 40 51.9	14.810
18	22 38 19.89	1.9504	7 26 2.7	14.828
19	22 40 16.79	1.9464	7 11 12.5	14.845
20	22 42 13.46	1.9425	6 56 21.3	14.861
21	22 44 9.89	1.9386	6 41 29.2	14.876
22	22 46 6.09	1.9348	6 26 36.2	14.890
23	22 48 2.07	1.9312	6 11 42.4	14.903
24	22 49 57.83	1.9276	S. 5 56 47.9	14.914

MONDAY 15.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	22 49 57.83	1.9276	S. 5 56 47.9	14.914
1	22 51 53.38	1.9240	5 41 52.7	14.924
2	22 53 48.71	1.9205	5 26 57.0	14.933
3	22 55 43.84	1.9171	5 12 0.8	14.941
4	22 57 38.76	1.9138	4 57 4.1	14.948
5	22 59 33.49	1.9106	4 42 7.0	14.954
6	23 1 28.03	1.9074	4 27 9.6	14.958
7	23 3 22.38	1.9043	4 12 12.0	14.961
8	23 5 16.55	1.9013	3 57 14.3	14.963
9	23 7 10.53	1.8983	3 42 16.4	14.966
10	23 9 4.34	1.8954	3 27 18.4	14.966
11	23 10 57.98	1.8927	3 12 20.5	14.964
12	23 12 51.46	1.8900	2 57 22.7	14.963
13	23 14 44.78	1.8873	2 42 25.0	14.960
14	23 16 37.94	1.8848	2 27 27.5	14.956
15	23 18 30.95	1.8823	2 12 30.3	14.950
16	23 20 23.81	1.8798	1 57 33.5	14.944
17	23 22 16.53	1.8775	1 42 37.0	14.938
18	23 24 9.11	1.8753	1 27 41.0	14.929
19	23 26 1.56	1.8731	1 12 45.5	14.921
20	23 27 53.88	1.8710	0 57 50.5	14.911
21	23 29 46.08	1.8689	0 42 56.2	14.899
22	23 31 38.15	1.8669	0 28 2.6	14.888
23	23 33 30.11	1.8651	S. 0 13 9.7	14.875

TUESDAY 16.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	23 35 21.96	1.8633	N. 0 1 42.4	14.861
1	23 37 13.71	1.8616	0 16 33.6	14.846
2	23 39 5.35	1.8598	0 31 23.9	14.830
3	23 40 56.89	1.8583	0 46 13.2	14.813
4	23 42 48.34	1.8568	1 1 1.5	14.797
5	23 44 39.70	1.8553	1 15 48.8	14.778
6	23 46 30.97	1.8539	1 30 34.9	14.758
7	23 48 22.17	1.8527	1 45 19.8	14.738
8	23 50 13.29	1.8514	2 0 3.4	14.716
9	23 52 4.34	1.8503	2 14 45.7	14.694
10	23 53 55.32	1.8491	2 29 26.7	14.672
11	23 55 46.23	1.8481	2 44 6.3	14.648
12	23 57 37.09	1.8472	2 58 44.4	14.623
13	23 59 27.89	1.8463	3 13 21.0	14.597
14	0 1 18.65	1.8456	3 27 56.0	14.570
15	0 3 9.36	1.8448	3 42 29.4	14.543
16	0 5 0.03	1.8442	3 57 1.2	14.515
17	0 6 50.66	1.8436	4 11 31.2	14.486
18	0 8 41.26	1.8431	4 25 59.5	14.456
19	0 10 31.83	1.8426	4 40 25.9	14.425
20	0 12 22.37	1.8423	4 54 50.5	14.394
21	0 14 12.90	1.8420	5 9 13.2	14.362
22	0 16 3.41	1.8417	5 23 33.9	14.328
23	0 17 53.90	1.8415	5 37 52.6	14.294
24	0 19 44.39	1.8415	N. 5 52 9.2	14.259

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 17.					FRIDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 19 44.39	1.8415	N. 5 52 9.2	14.259	0	1 49 15.88	1.9119	N. 16 22 1.6	11.703
1	0 21 34.88	1.8415	6 6 23.7	14.223	1	1 51 10.68	1.9148	16 33 41.6	11.631
2	0 23 25.37	1.8415	6 20 36.0	14.188	2	1 53 5.66	1.9178	16 45 17.3	11.559
3	0 25 15.86	1.8416	6 34 46.2	14.151	3	1 55 0.81	1.9207	16 56 48.7	11.487
4	0 27 6.36	1.8418	6 48 54.1	14.113	4	1 56 56.14	1.9238	17 8 15.7	11.413
5	0 28 56.88	1.8421	7 2 59.7	14.074	5	1 58 51.66	1.9268	17 19 38.3	11.339
6	0 30 47.41	1.8424	7 17 3.0	14.034	6	2 0 47.36	1.9298	17 30 56.4	11.264
7	0 32 37.97	1.8428	7 31 3.8	13.993	7	2 2 43.24	1.9329	17 42 10.0	11.189
8	0 34 28.55	1.8432	7 45 2.2	13.953	8	2 4 39.31	1.9362	17 53 19.1	11.113
9	0 36 19.15	1.8437	7 58 58.1	13.911	9	2 6 35.58	1.9394	18 4 23.6	11.036
10	0 38 9.79	1.8443	8 12 51.5	13.868	10	2 8 32.04	1.9427	18 15 23.4	10.958
11	0 40 0.47	1.8450	8 26 42.3	13.825	11	2 10 28.70	1.9460	18 26 18.6	10.880
12	0 41 51.19	1.8457	8 40 30.5	13.781	12	2 12 25.56	1.9493	18 37 9.0	10.801
13	0 43 41.95	1.8464	8 54 16.0	13.736	13	2 14 22.62	1.9528	18 47 54.7	10.721
14	0 45 32.76	1.8473	9 7 58.8	13.690	14	2 16 19.89	1.9562	18 58 35.5	10.640
15	0 47 23.63	1.8483	9 21 38.8	13.643	15	2 18 17.36	1.9596	19 9 11.5	10.559
16	0 49 14.55	1.8492	9 35 16.0	13.597	16	2 20 15.04	1.9631	19 19 42.6	10.477
17	0 51 5.53	1.8503	9 48 50.4	13.549	17	2 22 12.93	1.9667	19 30 8.7	10.394
18	0 52 56.58	1.8513	10 2 21.9	13.501	18	2 24 11.04	1.9703	19 40 29.9	10.311
19	0 54 47.69	1.8525	10 15 50.5	13.451	19	2 26 9.36	1.9738	19 50 46.0	10.227
20	0 56 38.88	1.8538	10 29 16.0	13.400	20	2 28 7.90	1.9775	20 0 57.1	10.142
21	0 58 30.14	1.8550	10 42 38.5	13.350	21	2 30 6.66	1.9812	20 11 3.0	10.056
22	1 0 21.48	1.8563	10 55 58.0	13.298	22	2 32 5.64	1.9849	20 21 3.8	9.970
23	1 2 12.90	1.8578	N. 11 9 14.3	13.245	23	2 34 4.85	1.9887	N. 20 30 59.4	9.883
	THURSDAY 18.					SATURDAY 20.			
0	1 4 4.42	1.8593	N. 11 22 27.4	13.192	0	2 36 4.28	1.9924	N. 20 40 49.8	9.795
1	1 5 56.02	1.8608	11 35 37.3	13.138	1	2 38 3.94	1.9963	20 50 34.8	9.706
2	1 7 47.72	1.8624	11 48 44.0	13.084	2	2 40 3.83	2.0001	21 0 14.5	9.617
3	1 9 39.51	1.8640	12 1 47.4	13.029	3	2 42 3.95	2.0039	21 9 48.8	9.526
4	1 11 31.40	1.8658	12 14 47.5	12.973	4	2 44 4.30	2.0078	21 19 17.6	9.435
5	1 13 23.40	1.8676	12 27 44.2	12.917	5	2 46 4.88	2.0117	21 28 41.0	9.344
6	1 15 15.51	1.8694	12 40 37.5	12.859	6	2 48 5.70	2.0157	21 37 58.9	9.252
7	1 17 7.73	1.8713	12 53 27.3	12.801	7	2 50 6.76	2.0196	21 47 11.2	9.158
8	1 19 0.06	1.8733	13 6 13.6	12.742	8	2 52 8.05	2.0236	21 56 17.9	9.064
9	1 20 52.52	1.8753	13 18 56.3	12.683	9	2 54 9.59	2.0276	22 5 18.9	8.969
10	1 22 45.10	1.8773	13 31 35.5	12.623	10	2 56 11.36	2.0315	22 14 14.2	8.874
11	1 24 37.80	1.8794	13 44 11.0	12.561	11	2 58 13.37	2.0356	22 23 3.8	8.778
12	1 26 30.63	1.8817	13 56 42.8	12.499	12	3 0 15.63	2.0397	22 31 47.6	8.682
13	1 28 23.60	1.8839	14 9 10.9	12.437	13	3 2 18.13	2.0438	22 40 25.6	8.583
14	1 30 16.70	1.8862	14 21 35.2	12.373	14	3 4 20.88	2.0478	22 48 57.6	8.485
15	1 32 9.94	1.8885	14 33 55.7	12.310	15	3 6 23.87	2.0519	22 57 23.8	8.387
16	1 34 3.32	1.8909	14 46 12.4	12.246	16	3 8 27.11	2.0560	23 5 44.0	8.286
17	1 35 56.85	1.8933	14 58 25.2	12.180	17	3 10 30.59	2.0602	23 13 58.1	8.185
18	1 37 50.52	1.8958	15 10 34.0	12.113	18	3 12 34.33	2.0643	23 22 6.2	8.084
19	1 39 44.35	1.8984	15 22 38.8	12.047	19	3 14 38.31	2.0684	23 30 8.2	7.982
20	1 41 38.33	1.9010	15 34 39.6	11.979	20	3 16 42.54	2.0725	23 38 4.0	7.879
21	1 43 32.47	1.9038	15 46 36.3	11.911	21	3 18 47.01	2.0767	23 45 53.7	7.776
22	1 45 26.78	1.9065	15 58 28.9	11.842	22	3 20 51.74	2.0809	23 53 37.1	7.670
23	1 47 21.25	1.9092	16 10 17.3	11.773	23	3 22 56.72	2.0851	24 1 14.1	7.565
24	1 49 15.88	1.9119	N. 16 22 1.6	11.703	24	3 25 1.95	2.0893	N. 24 8 44.9	7.460

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 21.					TUESDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 25 1.95	2.0893	N. 24 8 44.9	7.460	0	5 9 48.42	2.2633	N. 27 51 12.9	1.557
1	3 27 7.43	2.0934	24 16 9.3	7.353	1	5 12 4.29	2.2658	27 52 42.2	1.419
2	3 29 13.16	2.0976	24 23 27.3	7.246	2	5 14 20.31	2.2682	27 54 3.2	1.281
3	3 31 19.14	2.1017	24 30 38.8	7.138	3	5 16 36.47	2.2706	27 55 15.9	1.142
4	3 33 25.36	2.1058	24 37 43.8	7.029	4	5 18 52.78	2.2729	27 56 20.2	1.003
5	3 35 31.84	2.1101	24 44 42.3	6.919	5	5 21 9.22	2.2751	27 57 16.2	0.863
6	3 37 38.57	2.1142	24 51 34.1	6.808	6	5 23 25.79	2.2773	27 58 3.8	0.723
7	3 39 45.54	2.1183	24 58 19.3	6.698	7	5 25 42.50	2.2794	27 58 43.0	0.583
8	3 41 52.76	2.1224	25 4 57.8	6.586	8	5 27 59.32	2.2813	27 59 13.8	0.443
9	3 44 0.23	2.1266	25 11 29.6	6.473	9	5 30 16.26	2.2833	27 59 36.2	0.303
10	3 46 7.95	2.1308	25 17 54.6	6.360	10	5 32 33.32	2.2853	27 59 50.1	0.160
11	3 48 15.92	2.1348	25 24 12.8	6.246	11	5 34 50.49	2.2870	27 59 55.4	+0.018
12	3 50 24.13	2.1388	25 30 24.1	6.131	12	5 37 7.76	2.2887	27 59 52.3	−0.123
13	3 52 32.58	2.1429	25 36 28.5	6.015	13	5 39 25.13	2.2903	27 59 40.6	0.266
14	3 54 41.28	2.1470	25 42 25.9	5.899	14	5 41 42.60	2.2919	27 59 20.4	0.408
15	3 56 50.22	2.1510	25 48 16.4	5.783	15	5 44 0.16	2.2934	27 58 51.6	0.551
16	3 58 59.40	2.1550	25 53 59.8	5.664	16	5 46 17.81	2.2948	27 58 14.3	0.694
17	4 1 8.82	2.1590	25 59 36.1	5.547	17	5 48 35.54	2.2962	27 57 28.3	0.838
18	4 3 18.48	2.1630	26 5 5.4	5.428	18	5 50 53.35	2.2975	27 56 33.7	0.982
19	4 5 28.38	2.1669	26 10 27.5	5.308	19	5 53 11.24	2.2987	27 55 30.5	1.125
20	4 7 38.51	2.1708	26 15 42.3	5.187	20	5 55 29.19	2.2998	27 54 18.7	1.269
21	4 9 48.87	2.1746	26 20 49.9	5.066	21	5 57 47.21	2.3008	27 52 58.2	1.414
22	4 11 59.46	2.1785	26 25 50.2	4.944	22	6 0 5.28	2.3017	27 51 29.0	1.558
23	4 14 10.29	2.1823	N. 26 30 43.2	4.822	23	6 2 23.41	2.3026	N. 27 49 51.2	1.703
	MONDAY 22.					WEDNESDAY 24.			
0	4 16 21.34	2.1861	N. 26 35 28.8	4.698	0	6 4 41.59	2.3034	N. 27 48 4.7	1.848
1	4 18 32.62	2.1898	26 40 7.0	4.574	1	6 6 59.82	2.3041	27 46 9.5	1.993
2	4 20 44.12	2.1936	26 44 37.7	4.450	2	6 9 18.08	2.3047	27 44 5.6	2.138
3	4 22 55.85	2.1973	26 49 1.0	4.325	3	6 11 36.38	2.3053	27 41 52.9	2.283
4	4 25 7.79	2.2008	26 53 16.7	4.199	4	6 13 54.71	2.3057	27 39 31.6	2.428
5	4 27 19.95	2.2044	26 57 24.9	4.073	5	6 16 13.06	2.3061	27 37 1.6	2.573
6	4 29 32.32	2.2080	27 1 25.5	3.946	6	6 18 31.44	2.3065	27 34 22.8	2.719
7	4 31 44.91	2.2116	27 5 18.4	3.818	7	6 20 49.84	2.3067	27 31 35.3	2.864
8	4 33 57.71	2.2150	27 9 3.6	3.689	8	6 23 8.24	2.3068	27 28 39.1	3.010
9	4 36 10.71	2.2183	27 12 41.1	3.561	9	6 25 26.66	2.3069	27 25 34.1	3.156
10	4 38 23.91	2.2218	27 16 10.9	3.431	10	6 27 45.07	2.3068	27 22 20.4	3.301
11	4 40 37.32	2.2251	27 19 32.8	3.300	11	6 30 3.48	2.3068	27 18 58.0	3.446
12	4 42 50.92	2.2283	27 22 46.9	3.169	12	6 32 21.89	2.3067	27 15 26.9	3.591
13	4 45 4.71	2.2315	27 25 53.1	3.038	13	6 34 40.28	2.3064	27 11 47.1	3.737
14	4 47 18.70	2.2347	27 28 51.5	2.907	14	6 36 58.66	2.3062	27 7 58.5	3.882
15	4 49 32.88	2.2378	27 31 41.9	2.773	15	6 39 17.02	2.3058	27 4 1.3	4.027
16	4 51 47.24	2.2409	27 34 24.3	2.641	16	6 41 35.35	2.3053	26 59 55.3	4.173
17	4 54 1.79	2.2440	27 36 58.8	2.508	17	6 43 53.65	2.3048	26 55 40.6	4.317
18	4 56 16.52	2.2469	27 39 25.2	2.373	18	6 46 11.92	2.3042	26 51 17.3	4.461
19	4 58 31.42	2.2498	27 41 43.5	2.238	19	6 48 30.15	2.3035	26 46 45.3	4.606
20	5 0 46.49	2.2526	27 43 53.7	2.103	20	6 50 48.34	2.3028	26 42 4.6	4.751
21	5 3 1.73	2.2553	27 45 55.8	1.967	21	6 53 6.48	2.3019	26 37 15.2	4.895
22	5 5 17.13	2.2581	27 47 49.7	1.830	22	6 55 24.57	2.3011	26 32 17.2	5.038
23	5 7 32.70	2.2608	27 49 35.4	1.693	23	6 57 42.61	2.3002	26 27 10.6	5.182
24	5 9 48.42	2.2633	N. 27 51 12.9	1.557	24	7 0 0.59	2.2991	N. 26 21 55.4	5.326

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 25.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	7 0 0.59	2.2991	N. 26 21 55.4	5.326
1	7 2 18.50	2.2980	26 16 31.5	5.469
2	7 4 36.35	2.2968	26 10 59.1	5.612
3	7 6 54.12	2.2956	26 5 18.1	5.754
4	7 9 11.82	2.2943	25 59 28.6	5.897
5	7 11 29.44	2.2930	25 53 30.5	6.038
6	7 13 46.98	2.2916	25 47 24.0	6.179
7	7 16 4.43	2.2901	25 41 9.0	6.321
8	7 18 21.79	2.2886	25 34 45.5	6.463
9	7 20 39.06	2.2870	25 28 13.5	6.603
10	7 22 56.23	2.2853	25 21 33.2	6.743
11	7 25 13.30	2.2837	25 14 44.4	6.883
12	7 27 30.27	2.2819	25 7 47.3	7.022
13	7 29 47.13	2.2801	25 0 41.8	7.161
14	7 32 3.88	2.2783	24 53 28.0	7.299
15	7 34 20.52	2.2763	24 46 5.9	7.437
16	7 36 37.04	2.2744	24 38 35.6	7.573
17	7 38 53.45	2.2724	24 30 57.1	7.710
18	7 41 9.73	2.2703	24 23 10.4	7.847
19	7 43 25.89	2.2683	24 15 15.5	7.983
20	7 45 41.92	2.2662	24 7 12.5	8.118
21	7 47 57.83	2.2640	23 59 1.4	8.252
22	7 50 13.60	2.2618	23 50 42.3	8.385
23	7 52 29.24	2.2596	N. 23 42 15.2	8.518

FRIDAY 26.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	7 54 44.75	2.2573	N. 23 33 40.1	8.652
1	7 57 0.12	2.2549	23 24 57.0	8.783
2	7 59 15.34	2.2526	23 16 6.1	8.914
3	8 1 30.43	2.2503	23 7 7.3	9.045
4	8 3 45.37	2.2478	22 58 0.7	9.175
5	8 6 0.16	2.2453	22 48 46.3	9.304
6	8 8 14.81	2.2429	22 39 24.2	9.433
7	8 10 29.31	2.2404	22 29 54.4	9.561
8	8 12 43.66	2.2379	22 20 16.9	9.688
9	8 14 57.86	2.2354	22 10 31.8	9.814
10	8 17 11.91	2.2328	22 0 39.2	9.939
11	8 19 25.80	2.2303	21 50 39.1	10.064
12	8 21 39.54	2.2277	21 40 31.5	10.188
13	8 23 53.12	2.2251	21 30 16.5	10.312
14	8 26 6.55	2.2225	21 19 54.1	10.434
15	8 28 19.82	2.2198	21 9 24.4	10.555
16	8 30 32.93	2.2172	20 58 47.5	10.676
17	8 32 45.88	2.2145	20 48 3.3	10.796
18	8 34 58.67	2.2118	20 37 12.0	10.914
19	8 37 11.30	2.2093	20 26 13.6	11.032
20	8 39 23.78	2.2066	20 15 8.2	11.149
21	8 41 36.09	2.2039	20 3 55.7	11.266
22	8 43 48.25	2.2013	19 52 36.3	11.381
23	8 46 0.24	2.1985	19 41 10.0	11.496
24	8 48 12.07	2.1959	N. 19 29 36.8	11.609

SATURDAY 27.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	8 48 12.07	2.1959	N. 19 29 36.8	11.609
1	8 50 23.75	2.1933	19 17 56.9	11.721
2	8 52 35.26	2.1905	19 6 10.3	11.833
3	8 54 46.61	2.1879	18 54 17.0	11.943
4	8 56 57.81	2.1853	18 42 17.2	12.052
5	8 59 8.85	2.1828	18 30 10.8	12.161
6	9 1 19.74	2.1802	18 17 57.9	12.268
7	9 3 30.47	2.1775	18 5 38.6	12.375
8	9 5 41.04	2.1749	17 53 12.9	12.480
9	9 7 51.46	2.1723	17 40 41.0	12.584
10	9 10 1.72	2.1698	17 28 2.8	12.688
11	9 12 11.83	2.1673	17 15 18.5	12.790
12	9 14 21.79	2.1648	17 2 28.0	12.892
13	9 16 31.60	2.1623	16 49 31.5	12.991
14	9 18 41.26	2.1598	16 36 29.1	13.090
15	9 20 50.78	2.1574	16 23 20.7	13.188
16	9 23 0.15	2.1549	16 10 6.5	13.284
17	9 25 9.37	2.1525	15 56 46.6	13.380
18	9 27 18.45	2.1503	15 43 20.9	13.475
19	9 29 27.40	2.1479	15 29 49.6	13.568
20	9 31 36.20	2.1456	15 16 12.8	13.660
21	9 33 44.87	2.1433	15 2 30.4	13.752
22	9 35 53.40	2.1411	14 48 42.6	13.841
23	9 38 1.80	2.1389	N. 14 34 49.5	13.929

SUNDAY 28.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	9 40 10.07	2.1368	N. 14 20 51.1	14.017
1	9 42 18.21	2.1346	14 6 47.5	14.103
2	9 44 26.22	2.1325	13 52 38.7	14.188
3	9 46 34.11	2.1305	13 38 24.9	14.272
4	9 48 41.88	2.1285	13 24 6.1	14.354
5	9 50 49.53	2.1265	13 9 42.4	14.435
6	9 52 57.06	2.1246	12 55 13.9	14.515
7	9 55 4.48	2.1227	12 40 40.6	14.594
8	9 57 11.78	2.1208	12 26 2.6	14.673
9	9 59 18.98	2.1192	12 11 19.9	14.749
10	10 1 26.08	2.1174	11 56 32.7	14.823
11	10 3 33.07	2.1157	11 41 41.1	14.897
12	10 5 39.96	2.1141	11 26 45.1	14.969
13	10 7 46.76	2.1125	11 11 44.8	15.040
14	10 9 53.46	2.1109	10 56 40.3	15.110
15	10 12 0.07	2.1094	10 41 31.6	15.179
16	10 14 6.59	2.1080	10 26 18.8	15.247
17	10 16 13.03	2.1067	10 11 2.0	15.312
18	10 18 19.39	2.1053	9 55 41.4	15.376
19	10 20 25.67	2.1041	9 40 16.9	15.439
20	10 22 31.88	2.1029	9 24 48.7	15.501
21	10 24 38.02	2.1018	9 9 16.8	15.562
22	10 26 44.09	2.1006	8 53 41.3	15.621
23	10 28 50.09	2.0996	8 38 2.3	15.678
24	10 30 56.04	2.0987	N. 8 22 19.9	15.734

PHASES OF THE MOON.

			d	h	m
☾	Last Quarter	Feb.	6	17	10.9
●	New Moon		13	16	31.0
☽	First Quarter		21	14	58.3

			d	h
☾	Perigee	Feb.	7	1.3
☾	Apogee		20	17.9

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	22 45 32.75	9.379	S. 7 53 1.2	+56.74	16 10.29	65.47	12 40.60	0.476
Tues.	2	22 49 17.56	9.357	7 30 16.1	57.02	16 10.05	65.40	12 28.90	0.498
Wed.	3	22 53 1.87	9.336	7 7 24.5	57.28	16 9.80	65.33	12 16.69	0.519
Thur.	4	22 56 45.71	9.317	6 44 26.8	+57.53	16 9.55	65.26	12 4.00	0.539
Fri.	5	23 0 29.08	9.298	6 21 23.3	57.76	16 9.30	65.19	11 50.86	0.557
Sat.	6	23 4 12.02	9.280	5 58 14.5	57.97	16 9.04	65.13	11 37.28	0.574
SUN.	7	23 7 54.54	9.263	5 35 0.7	+58.17	16 8.78	65.07	11 23.29	0.591
Mon.	8	23 11 36.68	9.247	5 11 42.2	58.36	16 8.52	65.01	11 8.91	0.607
Tues.	9	23 15 18.43	9.232	4 48 19.5	58.53	16 8.26	64.95	10 54.15	0.622
Wed.	10	23 18 59.84	9.218	4 24 52.9	+58.68	16 8.00	64.89	10 39.04	0.636
Thur.	11	23 22 40.90	9.205	4 1 22.8	58.82	16 7.73	64.84	10 23.60	0.650
Fri.	12	23 26 21.65	9.192	3 37 49.7	58.94	16 7.46	64.79	10 7.84	0.663
Sat.	13	23 30 2.10	9.179	3 14 13.9	+59.04	16 7.19	64.74	9 51.77	0.675
SUN.	14	23 33 42.26	9.168	2 50 35.9	59.12	16 6.93	64.70	9 35.43	0.686
Mon.	15	23 37 22.16	9.157	2 26 56.0	59.19	16 6.66	64.66	9 18.82	0.697
Tues.	16	23 41 1.81	9.147	2 3 14.6	+59.25	16 6.40	64.63	9 1.96	0.707
Wed.	17	23 44 41.22	9.138	1 39 32.2	59.28	16 6.13	64.60	8 44.87	0.716
Thur.	18	23 48 20.42	9.129	1 15 49.1	59.30	16 5.86	64.57	8 27.56	0.725
Fri.	19	23 51 59.42	9.121	0 52 5.8	+59.30	16 5.60	64.54	8 10.05	0.733
Sat.	20	23 55 38.24	9.114	0 28 22.5	59.29	16 5.33	64.52	7 52.37	0.740
SUN.	21	23 59 16.90	9.108	S. 0 4 39.7	59.26	16 5.06	64.50	7 34.52	0.746
Mon.	22	0 2 55.42	9.102	N. 0 19 2.2	+59.22	16 4.79	64.48	7 16.54	0.752
Tues.	23	0 6 33.82	9.098	0 42 42.9	59.16	16 4.52	64.47	6 58.43	0.757
Wed.	24	0 10 12.11	9.094	1 6 22.0	59.09	16 4.25	64.46	6 40.22	0.761
Thur.	25	0 13 50.32	9.091	1 29 59.2	+59.00	16 3.98	64.45	6 21.92	0.764
Fri.	26	0 17 28.46	9.089	1 53 34.0	58.90	16 3.71	64.44	6 3.56	0.766
Sat.	27	0 21 6.57	9.087	2 17 6.3	58.78	16 3.43	64.44	5 45.17	0.767
SUN.	28	0 24 44.66	9.087	2 40 35.5	+58.65	16 3.16	64.44	5 26.75	0.768
Mon.	29	0 28 22.74	9.088	3 4 1.5	58.51	16 2.89	64.44	5 8.33	0.767
Tues.	30	0 32 0.85	9.089	3 27 23.9	58.35	16 2.61	64.45	4 49.94	0.765
Wed.	31	0 35 39.02	9.092	3 50 42.2	58.18	16 2.33	64.46	4 31.60	0.762
Thur.	32	0 39 17.25	9.096	N. 4 13 56.4	+57.99	16 2.05	64.47	4 13.33	0.759

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting $0^{s}.18$ from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	22 45 30.76	9.380	S. 7 53 13.2	+56.74	12 40.70	0.476	22 32 50.06
Tues.	2	22 49 15.61	9.358	7 30 27.9	57.02	12 29.00	0.498	22 36 46.61
Wed.	3	22 52 59.96	9.338	7 7 36.2	57.28	12 16.80	0.519	22 40 43.17
Thur.	4	22 56 43.83	9.318	6 44 38.4	+57.53	12 4.11	0.539	22 44 39.72
Fri.	5	23 0 27.24	9.300	6 21 34.7	57.76	11 50.97	0.557	22 48 36.28
Sat.	6	23 4 10.22	9.282	5 58 25.7	57.98	11 37.39	0.574	22 52 32.83
SUN.	7	23 7 52.78	9.265	5 35 11.7	+58.18	11 23.40	0.591	22 56 29.38
Mon.	8	23 11 34.96	9.249	5 11 53.0	58.37	11 9.02	0.607	23 0 25.94
Tues.	9	23 15 16.76	9.234	4 48 30.1	58.54	10 54.26	0.622	23 4 22.49
Wed.	10	23 18 58.20	9.220	4 25 3.3	+58.69	10 39.15	0.636	23 8 19.04
Thur.	11	23 22 39.31	9.206	4 1 33.0	58.83	10 23.71	0.650	23 12 15.60
Fri.	12	23 26 20.10	9.193	3 37 59.6	58.95	10 7.95	0.663	23 16 12.15
Sat.	13	23 30 0.59	9.181	3 14 23.6	+59.05	9 51.88	0.675	23 20 8.70
SUN.	14	23 33 40.80	9.170	2 50 45.3	59.14	9 35.54	0.686	23 24 5.26
Mon.	15	23 37 20.74	9.159	2 27 5.2	59.21	9 18.93	0.697	23 28 1.81
Tues.	16	23 41 0.43	9.149	2 3 23.5	+59.26	9 2.07	0.707	23 31 58.37
Wed.	17	23 44 39.89	9.140	1 39 40.8	59.29	8 44.97	0.716	23 35 54.92
Thur.	18	23 48 19.13	9.131	1 15 57.4	59.31	8 27.66	0.725	23 39 51.47
Fri.	19	23 51 58.18	9.123	0 52 13.8	+59.32	8 10.15	0.733	23 43 48.03
Sat.	20	23 55 37.04	9.116	0 28 30.3	59.30	7 52.46	0.740	23 47 44.58
SUN.	21	23 59 15.75	9.110	S. 0 4 47.2	59.27	7 34.62	0.746	23 51 41.13
Mon.	22	0 2 54.32	9.104	N. 0 18 55.0	+59.22	7 16.63	0.752	23 55 37.69
Tues.	23	0 6 32.76	9.100	0 42 36.0	59.16	6 58.52	0.757	23 59 34.24
Wed.	24	0 10 11.10	9.096	1 6 15.4	59.08	6 40.30	0.761	0 3 30.80
Thur.	25	0 13 49.35	9.093	1 29 52.9	+59.00	6 22.00	0.764	0 7 27.35
Fri.	26	0 17 27.55	9.091	1 53 28.1	58.91	6 3.64	0.766	0 11 23.90
Sat.	27	0 21 5.70	9.090	2 17 0.6	58.79	5 45.24	0.767	0 15 20.46
SUN.	28	0 24 43.83	9.089	2 40 30.2	+58.66	5 26.82	0.768	0 19 17.01
Mon.	29	0 28 21.96	9.090	3 3 56.5	58.52	5 8.40	0.767	0 23 13.56
Tues.	30	0 32 0.12	9.091	3 27 19.2	58.36	4 50.00	0.765	0 27 10.12
Wed.	31	0 35 38.33	9.094	3 50 37.8	58.19	4 31.66	0.762	0 31 6.67
Thur.	32	0 39 16.61	9.097	N. 4 13 52.3	+58.01	4 13.39	0.759	0 35 3.22

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; north declinations, increasing.

Diff. for 1 Hour, $+9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S True Longitude. λ	THE SUN'S True Longitude. λ′	Diff. for 1 Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	60	339 50 14.0	49 55.5	150.48	−0.03	9.996 0493	+44.8	1 26 55.66
2	61	340 50 24.5	50 5.8	150.40	0.16	9.996 1576	45.6	1 22 59.75
3	62	341 50 33.2	50 14.4	150.33	0.28	9.996 2676	46.3	1 19 3.84
4	63	342 50 40.2	50 21.3	150.26	−0.38	9.996 3793	+46.9	1 15 7.94
5	64	343 50 45.5	50 26.5	150.19	0.45	9.996 4926	47.4	1 11 12.03
6	65	344 50 49.2	50 30.1	150.12	0.49	9.996 6073	48.0	1 7 16.12
7	66	345 50 51.4	50 32.2	150.06	−0.50	9.996 7232	+48.5	1 3 20.21
8	67	346 50 52.0	50 32.6	149.99	0.47	9.996 8402	48.9	0 59 24.30
9	68	347 50 51.0	50 31.5	149.92	0.41	9.996 9582	49.3	0 55 28.40
10	69	348 50 48.4	50 28.8	149.85	−0.33	9.997 0768	+49.5	0 51 32.49
11	70	349 50 44.1	50 24.4	149.78	0.21	9.997 1960	49.7	0 47 36.58
12	71	350 50 38.1	50 18.3	149.71	−0.08	9.997 3156	49.9	0 43 40.67
13	72	351 50 30.4	50 10.5	149.64	+0.06	9.997 4354	+50.0	0 39 44.76
14	73	352 50 20.8	50 0.8	149.56	0.19	9.997 5555	50.0	0 35 48.86
15	74	553 50 9.4	49 49.3	149.48	0.32	9.997 6757	50.1	0 31 52.95
16	75	354 49 56.0	49 35.8	149.40	+0.44	9.997 7959	+50.1	0 27 57.04
17	76	355 49 40.5	49 20.2	149.31	0.54	9.997 9161	50.1	0 24 1.14
18	77	356 49 23.0	49 2.6	149.22	0.61	9.998 0364	50.1	0 20 5.23
19	78	357 49 3.3	48 42.8	149.13	+0.66	9.998 1568	+50.2	0 16 9.32
20	79	358 48 41.4	48 20.8	149.04	0.69	9.998 2772	50.2	0 12 13.41
21	80	359 48 17.3	47 56.6	148.95	0.68	9.998 3978	50.3	0 8 17.50
22	81	0 47 51.0	47 30.1	148.86	+0.65	9.998 5186	+50.4	0 4 21.60
23	82	1 47 22.3	47 1.4	148.76	0.60	9.998 6395	50.5	0 0 25.69 23 56 29.78
24	83	2 46 51.4	46 30.3	148.67	0.52	9.998 7608	50.6	23 52 33.87
25	84	3 46 18.1	45 56.9	148.57	+0.41	9.998 8823	+50.7	23 48 37.96
26	85	4 45 42.5	45 21.2	148.47	0.30	9.999 0043	50.9	23 44 42.06
27	86	5 45 4.7	44 43.3	148.37	0.18	9.999 1269	51.2	23 40 46.15
28	87	6 44 24.5	44 3.0	148.28	+0.05	9.999 2500	+51.4	23 36 50.24
29	88	7 43 42.2	43 20.5	148.19	−0.08	9.999 3738	51.7	23 32 54.33
30	89	8 42 57.6	42 35.9	148.10	0.20	9.999 4983	52.0	23 28 58.42
31	90	9 42 11.0	41 49.1	148.01	0.30	9.999 6236	52.3	23 25 2.52
32	91	10 41 22.3	41 0.3	147.93	−0.37	9.999 7495	+52.6	23 21 6.61

NOTE.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour, $-9^{s}.8296$. (Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 59.9	16 4.7	58 37.05	+1.561	58 54.78	+1.388	12 22.0	1.99	15.3
2	16 9.0	16 12.5	59 10.27	1.190	59 23.26	0.972	13 9.9	2.01	16.3
3	16 15.3	16 17.4	59 33.56	0.743	59 41.06	0.507	13 58 9	2.08	17.3
4	16 18.6	16 19.2	59 45.75	+0.276	59 47.72	+0.055	14 50.2	2.20	18.3
5	16 19.0	16 18.2	59 47.12	−0.151	59 44.16	−0.339	15 44.7	2.34	19.3
6	16 16.8	16 14.9	59 39.09	0.504	59 32.17	0.646	16 42.7	2.49	20.3
7	16 12.6	16 10.0	59 23.69	−0.763	59 13.92	−0.861	17 43.6	2.57	21.3
8	16 7.0	16 3.8	59 3.09	0.941	58 51.41	1.003	18 45.4	2.56	22.3
9	16 0.5	15 56.9	58 39.06	1.053	58 26.18	1.092	19 45.9	2.45	23.3
10	15 53.3	15 49.6	58 12.90	−1.121	57 59.29	−1.147	20 42.9	2.28	24.3
11	15 45.8	15 42.0	57 45.40	1.168	57 31.27	1.187	21 35.5	2.10	25.3
12	15 38.1	15 34.1	57 16.92	1.205	57 2.38	1.219	22 24.1	1.95	26.3
13	15 30.1	15 26.1	56 47.70	−1.229	56 32.92	−1.234	23 9.2	1.82	27.3
14	15 22.0	15 18.0	56 18.10	1.234	56 3.33	1.226	23 52.1	1.75	28.3
15	15 14.0	15 10.1	55 48.72	1.207	55 34.40	1.176	6	. .	29.3
16	15 6.4	15 2.8	55 20.54	−1.131	55 7.30	−1.073	0 33.7	1.73	0.7
17	14 59.4	14 56.2	54 54.86	0.998	54 43.41	0.907	1 15.3	1.74	1.7
18	14 53.4	14 51.0	54 33.16	0.798	54 24.32	0.673	1 57.6	1.79	2.7
19	14 49.1	14 47.6	54 17.09	−0.530	54 11.66	−0.372	2 41.6	1.88	3.7
20	14 46.6	14 46.3	54 8.20	−0.202	54 6.87	−0.018	3 27.7	1.97	4.7
21	14 46.6	14 47.5	54 7.82	+0.178	54 11.17	+0.382	4 16.1	2.07	5.7
22	14 49.0	14 51.3	54 17.00	+0.591	54 25.38	+0.806	5 6.7	2.14	6.7
23	14 54.3	14 58.0	54 36.34	1.021	54 49.86	1.231	5 58.6	2.18	7.7
24	15 2.4	15 7.4	55 5.87	1.435	55 24.25	1.627	6 50.8	2.17	8.7
25	15 13.0	15 19.1	55 44.84	+1.803	56 7.42	+1.957	7 42.4	2.13	9.7
26	15 25.8	15 32.7	56 31.70	2.085	56 57.33	2.180	8 32.7	2.07	10.7
27	15 40.0	15 47.3	57 23.88	2.237	57 50.85	2.251	9 21.7	2.02	11.7
28	15 54.6	16 1.8	58 17.70	+2.217	58 43.86	+2.134	10 9.9	2.00	12.7
29	16 8.5	16 14.8	59 8.72	2.000	59 31.65	1.813	10 57.9	2.02	13.7
30	16 20.4	16 25.1	59 52.05	1.579	60 9.38	1.303	11 47.1	2.09	14.7
31	16 28.8	16 31.6	60 23.21	0.997	60 33.22	+0.669	12 38.6	2.21	15.7
32	16 33.2	16 33.7	60 39.21	+0.329	60 41.11	−0.011	13 33.5	2.37	16.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 1.			
	h m s	s	° ′ ″	″
0	10 30 56.04	2.0987	N. 8 22 19.9	15.734
1	10 33 1.93	2.0978	8 6 34.2	15.789
2	10 35 7.77	2.0969	7 50 45.2	15.843
3	10 37 13.56	2.0961	7 34 53.0	15.895
4	10 39 19.30	2.0953	7 18 57.8	15.945
5	10 41 25.00	2.0947	7 2 59.6	15.994
6	10 43 30.66	2.0941	6 46 58.5	16.043
7	10 45 36.29	2.0936	6 30 54.5	16.089
8	10 47 41.89	2.0931	6 14 47.8	16.133
9	10 49 47.46	2.0927	5 58 38.5	16.176
10	10 51 53.01	2.0923	5 42 26.7	16.218
11	10 53 58.54	2.0921	5 26 12.3	16.259
12	10 56 4.06	2.0919	5 9 55.6	16.298
13	10 58 9.57	2.0918	4 53 36.6	16.335
14	11 0 15.08	2.0918	4 37 15.4	16.371
15	11 2 20.58	2.0917	4 20 52.1	16.406
16	11 4 26.08	2.0918	4 4 26.7	16.439
17	11 6 31.59	2.0919	3 47 59.4	16.470
18	11 8 37.11	2.0922	3 31 30.3	16.500
19	11 10 42.65	2.0925	3 14 59.4	16.529
20	11 12 48.21	2.0928	2 58 26.8	16.556
21	11 14 53.79	2.0933	2 41 52.7	16.581
22	11 16 59.40	2.0938	2 25 17.1	16.606
23	11 19 5.04	2.0943	N. 2 8 40.0	16.628
	TUESDAY 2.			
0	11 21 10.72	2.0950	N. 1 52 1.7	16.648
1	11 23 16.44	2.0958	1 35 22.2	16.668
2	11 25 22.21	2.0966	1 18 41.6	16.685
3	11 27 28.03	2.0974	1 2 0.0	16.701
4	11 29 33.90	2.0983	0 45 17.5	16.716
5	11 31 39.83	2.0994	0 28 34.1	16.729
6	11 33 45.83	2.1005	N. 0 11 50.0	16.741
7	11 35 51.89	2.1017	S. 0 4 54.8	16.750
8	11 37 58.03	2.1029	0 21 40.0	16.758
9	11 40 4.24	2.1043	0 38 25.7	16.764
10	11 42 10.54	2.1057	0 55 11.7	16.769
11	11 44 16.92	2.1072	1 11 58.0	16.773
12	11 46 23.40	2.1088	1 28 44.4	16.774
13	11 48 29.97	2.1103	1 45 30.9	16.774
14	11 50 36.64	2.1121	2 2 17.3	16.773
15	11 52 43.42	2.1139	2 19 3.6	16.769
16	11 54 50.31	2.1158	2 35 49.6	16.764
17	11 56 57.31	2.1177	2 52 35.3	16.758
18	11 59 4.43	2.1198	3 9 20.5	16.749
19	12 1 11.68	2.1218	3 26 5.2	16.740
20	12 3 19.05	2.1240	3 42 49.3	16.728
21	12 5 26.56	2.1263	3 59 32.6	16.715
22	12 7 34.20	2.1286	4 16 15.1	16.701
23	12 9 41.99	2.1310	4 32 56.7	16.684
24	12 11 49.92	2.1334	S. 4 49 37.2	16.665

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 3.			
	h m s	s	° ′ ″	″
0	12 11 49.92	2.1334	S. 4 49 37.2	16.665
1	12 13 58.00	2.1360	5 6 16.5	16.645
2	12 16 6.24	2.1387	5 22 54.6	16.624
3	12 18 14.64	2.1414	5 39 31.4	16.601
4	12 20 23.21	2.1442	5 56 6.7	16.575
5	12 22 31.94	2.1470	6 12 40.4	16.548
6	12 24 40.85	2.1499	6 29 12.5	16.520
7	12 26 49.93	2.1529	6 45 42.8	16.490
8	12 28 59.20	2.1561	7 2 11.3	16.459
9	12 31 8.66	2.1593	7 18 37.9	16.426
10	12 33 18.31	2.1624	7 35 2.4	16.390
11	12 35 28.15	2.1658	7 51 24.7	16.353
12	12 37 38.20	2.1692	8 7 44.7	16.313
13	12 39 48.45	2.1726	8 24 2.3	16.273
14	12 41 58.91	2.1762	8 40 17.5	16.232
15	12 44 9.59	2.1798	8 56 30.1	16.188
16	12 46 20.48	2.1834	9 12 40.0	16.142
17	12 48 31.60	2.1872	9 28 47.1	16.094
18	12 50 42.94	2.1909	9 44 51.3	16.045
19	12 52 54.51	2.1948	10 0 52.5	15.994
20	12 55 6.32	2.1988	10 16 50.6	15.941
21	12 57 18.36	2.2028	10 32 45.4	15.886
22	12 59 30.65	2.2068	10 48 36.9	15.830
23	13 1 43.18	2.2110	S. 11 4 25.0	15.773
	THURSDAY 4.			
0	13 3 55.97	2.2153	S. 11 20 9.6	15.713
1	13 6 9.01	2.2195	11 35 50.5	15.651
2	13 8 22.31	2.2238	11 51 27.7	15.588
3	13 10 35.87	2.2283	12 7 1.0	15.523
4	13 12 49.70	2.2328	12 22 30.4	15.456
5	13 15 3.80	2.2373	12 37 55.7	15.387
6	13 17 18.18	2.2419	12 53 16.8	15.316
7	13 19 32.83	2.2465	13 8 33.6	15.244
8	13 21 47.76	2.2512	13 23 46.1	15.171
9	13 24 2.97	2.2559	13 38 54.1	15.094
10	13 26 18.47	2.2608	13 53 57.4	15.017
11	13 28 34.26	2.2656	14 8 56.1	14.938
12	13 30 50.34	2.2705	14 23 49.9	14.856
13	13 33 6.72	2.2755	14 38 38.8	14.773
14	13 35 23.40	2.2805	14 53 22.7	14.688
15	13 37 40.38	2.2855	15 8 1.4	14.602
16	13 39 57.66	2.2906	15 22 34.9	14.514
17	13 42 15.25	2.2958	15 37 3.1	14.424
18	13 44 33.15	2.3010	15 51 25.8	14.332
19	13 46 51.37	2.3063	16 5 42.9	14.238
20	13 49 9.90	2.3115	16 19 54.4	14.143
21	13 51 28.75	2.3168	16 34 0.1	14.047
22	13 53 47.92	2.3222	16 48 0.0	13.948
23	13 56 7.41	2.3275	17 1 53.8	13.847
24	13 58 27.22	2.3329	S. 17 15 41.6	13.744

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.			Diff. for 1 Min.
	FRIDAY 5.							
	h	m	s	s	°	′	″	″
0	13	58	27.22	2.3329	S. 17	15	41.6	13.744
1	14	0	47.36	2.3384	17	29	23.1	13.640
2	14	3	7.83	2.3439	17	42	58.4	13.535
3	14	5	28.63	2.3494	17	56	27.3	13.427
4	14	7	49.76	2.3549	18	9	49.6	13.318
5	14	10	11.22	2.3604	18	23	5.4	13.208
6	14	12	33.01	2.3660	18	36	14.5	13.094
7	14	14	55.14	2.3716	18	49	16.7	12.979
8	14	17	17.60	2.3772	19	2	12.0	12.863
9	14	19	40.40	2.3828	19	15	0.3	12.746
10	14	22	3.54	2.3885	19	27	41.5	12.627
11	14	24	27.02	2.3941	19	40	15.5	12.505
12	14	26	50.83	2.3997	19	52	42.1	12.382
13	14	29	14.98	2.4053	20	5	1.3	12.258
14	14	31	39.47	2.4110	20	17	13.0	12.131
15	14	34	4.30	2.4166	20	29	17.0	12.003
16	14	36	29.46	2.4222	20	41	13.3	11.873
17	14	38	54.96	2.4278	20	53	1.8	11.742
18	14	41	20.80	2.4334	21	4	42.3	11.608
19	14	43	46.97	2.4390	21	16	14.8	11.475
20	14	46	13.48	2.4446	21	27	39.3	11.339
21	14	48	40.32	2.4502	21	38	55.5	11.201
22	14	51	7.50	2.4558	21	50	3.4	11.062
23	14	53	35.01	2.4612	S. 22	1	2.9	10.922
	SATURDAY 6.							
0	14	56	2.84	2.4667	S. 22	11	54.0	10.779
1	14	58	31.01	2.4722	22	22	36.4	10.635
2	15	0	59.50	2.4775	22	33	10.2	10.490
3	15	3	28.31	2.4829	22	43	35.2	10.343
4	15	5	57.45	2.4883	22	53	51.4	10.195
5	15	8	26.91	2.4936	23	3	58.6	10.045
6	15	10	56.68	2.4988	23	13	56.8	9.893
7	15	13	26.77	2.5041	23	23	45.8	9.740
8	15	15	57.17	2.5092	23	33	25.6	9.587
9	15	18	27.87	2.5143	23	42	56.2	9.432
10	15	20	58.88	2.5193	23	52	17.4	9.275
11	15	23	30.19	2.5243	24	1	29.2	9.117
12	15	26	1.79	2.5292	24	10	31.4	8.957
13	15	28	33.69	2.5341	24	19	24.0	8.796
14	15	31	5.88	2.5388	24	28	6.9	8.634
15	15	33	38.35	2.5435	24	36	40.1	8.471
16	15	36	11.10	2.5482	24	45	3.4	8.306
17	15	38	44.13	2.5527	24	53	16.8	8.140
18	15	41	17.42	2.5572	25	1	20.2	7.973
19	15	43	50.99	2.5616	25	9	13.6	7.806
20	15	46	24.81	2.5658	25	16	56.9	7.636
21	15	48	58.88	2.5700	25	24	29.9	7.465
22	15	51	33.21	2.5742	25	31	52.7	7.294
23	15	54	7.78	2.5781	25	39	5.2	7.122
24	15	56	42.58	2.5820	S. 25	46	7.3	6.948

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.			Diff. for 1 Min.
	SUNDAY 7.							
	h	m	s	s	°	′	″	″
0	15	56	42.58	2.5820	S. 25	46	7.3	6.948
1	15	59	17.62	2.5858	25	52	58.9	6.773
2	16	1	52.88	2.5894	25	59	40.1	6.598
3	16	4	28.35	2.5930	26	6	10.7	6.422
4	16	7	4.04	2.5965	26	12	30.7	6.244
5	16	9	39.93	2.5998	26	18	40.0	6.066
6	16	12	16.02	2.6030	26	24	38.6	5.887
7	16	14	52.29	2.6061	26	30	26.4	5.706
8	16	17	28.75	2.6092	26	36	3.3	5.525
9	16	20	5.39	2.6120	26	41	29.4	5.345
10	16	22	42.19	2.6147	26	46	44.7	5.163
11	16	25	19.15	2.6173	26	51	49.0	4.979
12	16	27	56.27	2.6198	26	56	42.2	4.795
13	16	30	33.53	2.6222	27	1	24.4	4.612
14	16	33	10.93	2.6243	27	5	55.6	4.428
15	16	35	48.45	2.6263	27	10	15.7	4.242
16	16	38	26.09	2.6282	27	14	24.6	4.055
17	16	41	3.84	2.6301	27	18	22.3	3.869
18	16	43	41.70	2.6318	27	22	8.9	3.683
19	16	46	19.65	2.6332	27	25	44.2	3.495
20	16	48	57.68	2.6344	27	29	8.3	3.308
21	16	51	35.78	2.6356	27	32	21.2	3.120
22	16	54	13.95	2.6367	27	35	22.7	2.932
23	16	56	52.18	2.6376	S. 27	38	13.0	2.743
	MONDAY 8.							
0	16	59	30.46	2.6383	S. 27	40	51.9	2.554
1	17	2	8.78	2.6388	27	43	19.5	2.366
2	17	4	47.12	2.6393	27	45	35.8	2.177
3	17	7	25.49	2.6396	27	47	40.7	1.988
4	17	10	3.87	2.6397	27	49	34.3	1.798
5	17	12	42.25	2.6396	27	51	16.5	1.608
6	17	15	20.62	2.6393	27	52	47.3	1.419
7	17	17	58.97	2.6390	27	54	6.8	1.231
8	17	20	37.30	2.6386	27	55	15.0	1.042
9	17	23	15.60	2.6379	27	56	11.8	0.853
10	17	25	53.85	2.6371	27	56	57.3	0.664
11	17	28	32.05	2.6361	27	57	31.5	0.475
12	17	31	10.18	2.6349	27	57	54.3	0.286
13	17	33	48.24	2.6337	27	58	5.8	−0.098
14	17	36	26.22	2.6322	27	58	6.1	+0.089
15	17	39	4.10	2.6305	27	57	55.1	0.278
16	17	41	41.88	2.6288	27	57	32.8	0.464
17	17	44	19.55	2.6269	27	56	59.4	0.651
18	17	46	57.11	2.6248	27	56	14.7	0.838
19	17	49	34.53	2.6226	27	55	18.9	1.023
20	17	52	11.82	2.6203	27	54	11.9	1.209
21	17	54	48.96	2.6178	27	52	53.8	1.393
22	17	57	25.95	2.6151	27	51	24.7	1.578
23	18	0	2.77	2.6122	27	49	44.5	1.762
24	18	2	39.42	2.6093	S. 27	47	53.3	1.944

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 9.					THURSDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 2 39.42	2.6093	S. 27 47 53.3	1.944	0	20 2 18.37	2.3450	S. 23 2 30.1	9.467
1	18 5 15.89	2.6062	27 45 51.2	2.127	1	20 4 38.86	2.3381	22 52 58.4	9.589
2	18 7 52.16	2.6028	27 43 38.1	2.309	2	20 6 58.94	2.3312	22 43 19.4	9.711
3	18 10 28.23	2.5995	27 41 14.1	2.490	3	20 9 18.60	2.3243	22 33 33.1	9.831
4	18 13 4.10	2.5960	27 38 39.3	2.670	4	20 11 37.85	2.3173	22 23 39.7	9.949
5	18 15 39.75	2.5923	27 35 53.7	2.849	5	20 13 56.68	2.3104	22 13 39.2	10.066
6	18 18 15.19	2.5885	27 32 57.4	3.028	6	20 16 15.10	2.3036	22 3 31.8	10.181
7	18 20 50.39	2.5847	27 29 50.4	3.205	7	20 18 33.11	2.2967	21 53 17.5	10.295
8	18 23 25.35	2.5807	27 26 32.8	3.382	8	20 20 50.70	2.2898	21 42 56.4	10.408
9	18 26 0.07	2.5765	27 23 4.6	3.558	9	20 23 7.88	2.2828	21 32 28.6	10.518
10	18 28 34.53	2.5722	27 19 25.9	3.733	10	20 25 24.64	2.2759	21 21 54.2	10.628
11	18 31 8.73	2.5678	27 15 36.7	3.907	11	20 27 40.99	2.2691	21 11 13.3	10.736
12	18 33 42.66	2.5633	27 11 37.1	4.079	12	20 29 56.93	2.2623	21 0 25.9	10.841
13	18 36 16.32	2.5586	27 7 27.2	4.251	13	20 32 12.46	2.2554	20 49 32.3	10.946
14	18 38 49.69	2.5538	27 3 7.0	4.422	14	20 34 27.58	2.2486	20 38 32.4	11.049
15	18 41 22.77	2.5489	26 58 36.6	4.592	15	20 36 42.29	2.2418	20 27 26.4	11.150
16	18 43 55.56	2.5439	26 53 56.0	4.761	16	20 38 56.59	2.2349	20 16 14.4	11.250
17	18 46 28.04	2.5388	26 49 5.3	4.928	17	20 41 10.48	2.2282	20 4 56.4	11.349
18	18 49 0.22	2.5337	26 44 4.6	5.094	18	20 43 23.97	2.2215	19 53 32.5	11.447
19	18 51 32.08	2.5283	26 38 54.0	5.259	19	20 45 37.06	2.2148	19 42 2.8	11.542
20	18 54 3.62	2.5230	26 33 33.5	5.423	20	20 47 49.75	2.2082	19 30 27.5	11.635
21	18 56 34.84	2.5175	26 28 3.2	5.586	21	20 50 2.04	2.2015	19 18 46.6	11.728
22	18 59 5.72	2.5119	26 22 23.2	5.748	22	20 52 13.93	2.1949	19 7 0.2	11.819
23	19 1 36.27	2.5063	S. 26 16 33.5	5.908	23	20 54 25.43	2.1883	S. 18 55 8.3	11.909
	WEDNESDAY 10.					FRIDAY 12.			
0	19 4 6.47	2.5005	S. 26 10 34.2	6.068	0	20 56 36.53	2.1818	S. 18 43 11.1	11.997
1	19 6 36.33	2.4947	26 4 25.4	6.225	1	20 58 47.24	2.1753	18 31 8.7	12.083
2	19 9 5.83	2.4888	25 58 7.2	6.381	2	21 0 57.56	2.1688	18 19 1.2	12.168
3	19 11 34.98	2.4828	25 51 39.7	6.536	3	21 3 7.50	2.1625	18 6 48.6	12.251
4	19 14 3.76	2.4767	25 45 2.9	6.690	4	21 5 17.06	2.1560	17 54 31.1	12.333
5	19 16 32.18	2.4706	25 38 16.9	6.843	5	21 7 26.24	2.1498	17 42 8.7	12.413
6	19 19 0.23	2.4644	25 31 21.8	6.994	6	21 9 35.04	2.1435	17 29 41.6	12.492
7	19 21 27.91	2.4582	25 24 17.6	7.144	7	21 11 43.46	2.1373	17 17 9.7	12.570
8	19 23 55.21	2.4518	25 17 4.5	7.292	8	21 13 51.51	2.1311	17 4 33.2	12.646
9	19 26 22.13	2.4455	25 9 42.6	7.438	9	21 15 59.19	2.1249	16 51 52.2	12.720
10	19 28 48.67	2.4391	25 2 11.9	7.584	10	21 18 6.50	2.1188	16 39 6.8	12.793
11	19 31 14.82	2.4325	24 54 32.5	7.728	11	21 20 13.45	2.1128	16 26 17.0	12.865
12	19 33 40.57	2.4259	24 46 44.5	7.871	12	21 22 20.04	2.1068	16 13 23.0	12.935
13	19 36 5.93	2.4194	24 38 48.0	8.012	13	21 24 26.27	2.1009	16 0 24.8	13.004
14	19 38 30.90	2.4128	24 30 43.1	8.152	14	21 26 32.15	2.0951	15 47 22.5	13.072
15	19 40 55.47	2.4061	24 22 29.8	8.290	15	21 28 37.68	2.0893	15 34 16.2	13.138
16	19 43 19.64	2.3995	24 14 8.3	8.427	16	21 30 42.86	2.0835	15 21 6.0	13.202
17	19 45 43.41	2.3928	24 5 38.6	8.562	17	21 32 47.70	2.0778	15 7 52.0	13.265
18	19 48 6.77	2.3860	23 57 0.9	8.695	18	21 34 52.20	2.0723	14 54 34.2	13.327
19	19 50 29.73	2.3793	23 48 15.2	8.828	19	21 36 56.37	2.0667	14 41 12.8	13.387
20	19 52 52.28	2.3724	23 39 21.6	8.958	20	21 39 0.20	2.0611	14 27 47.8	13.446
21	19 55 14.42	2.3656	23 30 20.2	9.088	21	21 41 3.70	2.0556	14 14 19.3	13.504
22	19 57 36.15	2.3587	23 21 11.1	9.215	22	21 43 6.87	2.0502	14 0 47.3	13.561
23	19 59 57.46	2.3518	23 11 54.4	9.342	23	21 45 9.72	2.0449	13 47 12.0	13.616
24	20 2 18.37	2.3450	S. 23 2 30.1	9.467	24	21 47 12.26	2.0397	S. 13 33 33.4	13.669

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 13.					MONDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 47 12.26	2.0397	S. 13 33 33.4	13.669	0	23 20 19.64	1.8677	S. 1 59 25.3	14.808
1	21 49 14.48	2.0344	13 19 51.7	13.721	1	23 22 11.64	1.8658	1 44 36.9	14.804
2	21 51 16.39	2.0293	13 6 6.9	13.773	2	23 24 3.53	1.8640	1 29 48.8	14.800
3	21 53 17.99	2.0242	12 52 19.0	13.823	3	23 25 55.32	1.8623	1 15 0.9	14.795
4	21 55 19.29	2.0192	12 38 28.2	13.870	4	23 27 47.01	1.8607	1 0 13.4	14.788
5	21 57 20.29	2.0143	12 24 34.6	13.917	5	23 29 38.60	1.8591	0 45 26.3	14.782
6	21 59 21.00	2.0094	12 10 38.2	13.963	6	23 31 30.10	1.8576	0 30 39.6	14.773
7	22 1 21.42	2.0045	11 56 39.1	14.008	7	23 33 21.51	1.8562	0 15 53.5	14.763
8	22 3 21.54	1.9998	11 42 37.3	14.051	8	23 35 12.84	1.8548	S. 0 1 8.0	14.753
9	22 5 21.39	1.9952	11 28 33.0	14.093	9	23 37 4.09	1.8536	N. 0 13 36.9	14.743
10	22 7 20.96	1.9905	11 14 26.2	14.133	10	23 38 55.27	1.8523	0 28 21.1	14.731
11	22 9 20.25	1.9859	11 0 17.1	14.172	11	23 40 46.37	1.8512	0 43 4.6	14.718
12	22 11 19.27	1.9815	10 46 5.6	14.211	12	23 42 37.41	1.8501	0 57 47.2	14.703
13	22 13 18.03	1.9771	10 31 51.8	14.248	13	23 44 28.38	1.8491	1 12 29.0	14.688
14	22 15 16.52	1.9728	10 17 35.9	14.283	14	23 46 19.30	1.8482	1 27 9.8	14.673
15	22 17 14.76	1.9685	10 3 17.9	14.317	15	23 48 10.16	1.8473	1 41 49.7	14.656
16	22 19 12.74	1.9643	9 48 57.9	14.350	16	23 50 0.97	1.8465	1 56 28.5	14.638
17	22 21 10.48	1.9603	9 34 35.9	14.383	17	23 51 51.74	1.8458	2 11 6.2	14.619
18	22 23 7.97	1.9561	9 20 12.0	14.413	18	23 53 42.46	1.8451	2 25 42.8	14.600
19	22 25 5.21	1.9521	9 5 46.4	14.442	19	23 55 33.15	1.8445	2 40 18.2	14.579
20	22 27 2.22	1.9483	8 51 19.0	14.471	20	23 57 23.80	1.8439	2 54 52.3	14.558
21	22 28 59.00	1.9444	8 36 49.9	14.498	21	23 59 14.42	1.8434	3 9 25.1	14.535
22	22 30 55.55	1.9406	8 22 19.2	14.524	22	0 1 5.01	1.8430	3 23 56.5	14.512
23	22 32 51.87	1.9368	S. 8 7 47.0	14.548	23	0 2 55.58	1.8427	N. 3 38 26.5	14.488
	SUNDAY 14.					TUESDAY 16.			
0	22 34 47.97	1.9333	S. 7 53 13.4	14.572	0	0 4 46.13	1.8424	N. 3 52 55.1	14.463
1	22 36 43.86	1.9297	7 38 38.4	14.595	1	0 6 36.67	1.8423	4 7 22.1	14.438
2	22 38 39.53	1.9262	7 24 2.0	14.617	2	0 8 27.20	1.8421	4 21 47.6	14.411
3	22 40 35.00	1.9228	7 9 24.4	14.636	3	0 10 17.72	1.8420	4 36 11.4	14.383
4	22 42 30.26	1.9194	6 54 45.7	14.655	4	0 12 8.23	1.8419	4 50 33.6	14.355
5	22 44 25.33	1.9162	6 40 5.8	14.673	5	0 13 58.75	1.8421	5 4 54.0	14.325
6	22 46 20.20	1.9130	6 25 24.9	14.690	6	0 15 49.28	1.8422	5 19 12.6	14.295
7	22 48 14.89	1.9099	6 10 43.0	14.706	7	0 17 39.81	1.8423	5 33 29.4	14.264
8	22 50 9.39	1.9068	5 56 0.2	14.720	8	0 19 30.35	1.8425	5 47 44.3	14.232
9	22 52 3.71	1.9038	5 41 16.6	14.733	9	0 21 20.91	1.8428	6 1 57.3	14.199
10	22 53 57.85	1.9008	5 26 32.2	14.746	10	0 23 11.49	1.8432	6 16 8.2	14.165
11	22 55 51.81	1.8980	5 11 47.1	14.757	11	0 25 2.09	1.8437	6 30 17.1	14.131
12	22 57 45.61	1.8953	4 57 1.4	14.767	12	0 26 52.73	1.8442	6 44 23.9	14.096
13	22 59 39.24	1.8926	4 42 15.1	14.777	13	0 28 43.39	1.8447	6 58 28.6	14.059
14	23 1 32.72	1.8900	4 27 28.2	14.785	14	0 30 34.09	1.8453	7 12 31.0	14.022
15	23 3 26.04	1.8874	4 12 40.9	14.792	15	0 32 24.83	1.8460	7 26 31.2	13.984
16	23 5 19.21	1.8849	3 57 53.2	14.798	16	0 34 15.61	1.8468	7 40 29.1	13.945
17	23 7 12.23	1.8825	3 43 5.2	14.802	17	0 36 6.44	1.8476	7 54 24.6	13.905
18	23 9 5.11	1.8802	3 28 17.0	14.806	18	0 37 57.32	1.8484	8 8 17.7	13.865
19	23 10 57.85	1.8779	3 13 28.5	14.809	19	0 39 48.25	1.8493	8 22 8.4	13.824
20	23 12 50.46	1.8758	2 58 39.9	14.811	20	0 41 39.23	1.8503	8 35 56.6	13.782
21	23 14 42.94	1.8737	2 43 51.2	14.812	21	0 43 30.28	1.8513	8 49 42.2	13.738
22	23 16 35.29	1.8715	2 29 2.5	14.812	22	0 45 21.39	1.8524	9 3 25.2	13.695
23	23 18 27.52	1.8696	2 14 13.8	14.810	23	0 47 12.57	1.8536	9 17 5.6	13.650
24	23 20 19.64	1.8677	S. 1 59 25.3	14.808	24	0 49 3.82	1.8548	N. 9 30 43.2	13.604

33281°—1915——3

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 17.					FRIDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	0 49 3.82	1.8548	N. 9 30 43.2	13.604	0	2 20 28.74	1.9715	N. 19 16 4.1	10.482
1	0 50 55.15	1.8561	9 44 18.1	13.558	1	2 22 27.13	1.9749	19 26 30.5	10.398
2	0 52 46.55	1.8574	9 57 50.2	13.511	2	2 24 25.73	1.9784	19 36 51.9	10.313
3	0 54 38.04	1.8588	10 11 19.4	13.463	3	2 26 24.54	1.9818	19 47 8.1	10.228
4	0 56 29.61	1.8603	10 24 45.7	13.414	4	2 28 23.55	1.9853	19 57 19.2	10.141
5	0 58 21.27	1.8618	10 38 9.1	13.365	5	2 30 22.77	1.9888	20 7 25.0	10.053
6	1 0 13.02	1.8633	10 51 29.5	13.314	6	2 32 22.21	1.9924	20 17 25.6	9.966
7	1 2 4.86	1.8648	11 4 46.8	13.263	7	2 34 21.86	1.9959	20 27 20.9	9.878
8	1 3 56.80	1.8665	11 18 1.1	13.212	8	2 36 21.72	1.9994	20 37 10.9	9.788
9	1 5 48.84	1.8683	11 31 12.2	13.158	9	2 38 21.79	2.0030	20 46 55.5	9.698
10	1 7 40.99	1.8701	11 44 20.1	13.104	10	2 40 22.08	2.0067	20 56 34.6	9.606
11	1 9 33.25	1.8718	11 57 24.7	13.050	11	2 42 22.59	2.0103	21 6 8.2	9.514
12	1 11 25.61	1.8737	12 10 26.1	12.995	12	2 44 23.32	2.0139	21 15 36.3	9.423
13	1 13 18.09	1.8757	12 23 24.1	12.939	13	2 46 24.26	2.0176	21 24 58.9	9.329
14	1 15 10.69	1.8776	12 36 18.8	12.883	14	2 48 25.43	2.0213	21 34 15.8	9.235
15	1 17 3.40	1.8796	12 49 10.0	12.824	15	2 50 26.82	2.0250	21 43 27.1	9.140
16	1 18 56.24	1.8818	13 1 57.7	12.766	16	2 52 28.43	2.0287	21 52 32.6	9.044
17	1 20 49.21	1.8838	13 14 41.9	12.707	17	2 54 30.26	2.0324	22 1 32.4	8.948
18	1 22 42.30	1.8860	13 27 22.5	12.647	18	2 56 32.32	2.0362	22 10 26.4	8.851
19	1 24 35.53	1.8883	13 39 59.5	12.586	19	2 58 34.60	2.0398	22 19 14.5	8.753
20	1 26 28.89	1.8905	13 52 32.8	12.524	20	3 0 37.10	2.0436	22 27 56.8	8.655
21	1 28 22.39	1.8928	14 5 2.4	12.463	21	3 2 39.83	2.0473	22 36 33.1	8.556
22	1 30 16.03	1.8952	14 17 28.3	12.399	22	3 4 42.78	2.0511	22 45 3.5	8.456
23	1 32 9.81	1.8976	N. 14 29 50.3	12.335	23	3 6 45.96	2.0549	N. 22 53 27.8	8.355
	THURSDAY 18.					SATURDAY 20.			
0	1 34 3.74	1.9001	N. 14 42 8.5	12.271	0	3 8 49.37	2.0587	N. 23 1 46.1	8.254
1	1 35 57.82	1.9026	14 54 22.8	12.205	1	3 10 53.00	2.0624	23 9 58.3	8.152
2	1 37 52.05	1.9052	15 6 33.1	12.138	2	3 12 56.86	2.0662	23 18 4.3	8.048
3	1 39 46.44	1.9078	15 18 39.4	12.071	3	3 15 0.94	2.0699	23 26 4.1	7.945
4	1 41 40.99	1.9105	15 30 41.6	12.003	4	3 17 5.25	2.0738	23 33 57.7	7.841
5	1 43 35.70	1.9132	15 42 39.8	11.935	5	3 19 9.79	2.0775	23 41 45.0	7.736
6	1 45 30.57	1.9158	15 54 33.8	11.865	6	3 21 14.55	2.0813	23 49 26.0	7.630
7	1 47 25.60	1.9186	16 6 23.6	11.795	7	3 23 19.54	2.0851	23 57 0.6	7.523
8	1 49 20.80	1.9215	16 18 9.2	11.724	8	3 25 24.76	2.0888	24 4 28.8	7.417
9	1 51 16.18	1.9243	16 29 50.5	11.653	9	3 27 30.20	2.0925	24 11 50.6	7.309
10	1 53 11.72	1.9272	16 41 27.5	11.580	10	3 29 35.86	2.0963	24 19 5.9	7.201
11	1 55 7.44	1.9302	16 53 0.1	11.506	11	3 31 41.75	2.1000	24 26 14.7	7.092
12	1 57 3.34	1.9332	17 4 28.2	11.432	12	3 33 47.86	2.1037	24 33 16.9	6.981
13	1 58 59.42	1.9362	17 15 51.9	11.358	13	3 35 54.19	2.1074	24 40 12.4	6.870
14	2 0 55.68	1.9392	17 27 11.1	11.282	14	3 38 0.75	2.1112	24 47 1.3	6.759
15	2 2 52.12	1.9423	17 38 25.7	11.205	15	3 40 7.53	2.1148	24 53 43.5	6.648
16	2 4 48.75	1.9454	17 49 35.7	11.128	16	3 42 14.53	2.1185	25 0 19.0	6.534
17	2 6 45.57	1.9486	18 0 41.0	11.049	17	3 44 21.75	2.1221	25 6 47.6	6.421
18	2 8 42.58	1.9518	18 11 41.6	10.971	18	3 46 29.18	2.1257	25 13 9.5	6.308
19	2 10 39.78	1.9550	18 22 37.5	10.892	19	3 48 36.83	2.1293	25 19 24.5	6.193
20	2 12 37.18	1.9583	18 33 28.6	10.812	20	3 50 44.70	2.1329	25 25 32.6	6.078
21	2 14 34.77	1.9615	18 44 14.9	10.731	21	3 52 52.78	2.1365	25 31 33.8	5.962
22	2 16 32.56	1.9648	18 54 56.3	10.648	22	3 55 1.08	2.1400	25 37 28.0	5.845
23	2 18 30.55	1.9682	19 5 32.7	10.565	23	3 57 9.58	2.1435	25 43 15.2	5.728
24	2 20 28.74	1.9715	N. 19 16 4.1	10.482	24	3 59 18.30	2.1471	N. 25 48 55.3	5.610

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 21.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	3 59 18.30	2.1471	N. 25 48 55.3	5.610
1	4 1 27.23	2.1505	25 54 28.4	5.492
2	4 3 36.36	2.1539	25 59 54.3	5.372
3	4 5 45.70	2.1573	26 5 13.0	5.253
4	4 7 55.24	2.1607	26 10 24.6	5.133
5	4 10 4.98	2.1640	26 15 28.9	5.011
6	4 12 14.92	2.1673	26 20 25.9	4.889
7	4 14 25.05	2.1705	26 25 15.6	4.768
8	4 16 35.38	2.1738	26 29 58.0	4.645
9	4 18 45.90	2.1769	26 34 33.0	4.521
10	4 20 56.61	2.1801	26 39 0.5	4.397
11	4 23 7.51	2.1833	26 43 20.6	4.273
12	4 25 18.60	2.1863	26 47 33.3	4.148
13	4 27 29.87	2.1893	26 51 38.4	4.023
14	4 29 41.32	2.1923	26 55 36.0	3.897
15	4 31 52.94	2.1952	26 59 26.0	3.770
16	4 34 4.74	2.1981	27 3 8.4	3.643
17	4 36 16.71	2.2009	27 6 43.1	3.515
18	4 38 28.85	2.2038	27 10 10.2	3.387
19	4 40 41.16	2.2065	27 13 29.5	3.258
20	4 42 53.63	2.2092	27 16 41.1	3.129
21	4 45 6.26	2.2118	27 19 45.0	3.000
22	4 47 19.05	2.2144	27 22 41.1	2.870
23	4 49 31.99	2.2169	N. 27 25 29.4	2.739

MONDAY 22.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	4 51 45.08	2.2194	N. 27 28 9.8	2.608
1	4 53 58.32	2.2218	27 30 42.3	2.477
2	4 56 11.70	2.2242	27 33 7.0	2.345
3	4 58 25.22	2.2265	27 35 23.7	2.213
4	5 0 38.88	2.2288	27 37 32.5	2.080
5	5 2 52.67	2.2310	27 39 33.3	1.948
6	5 5 6.60	2.2332	27 41 26.2	1.814
7	5 7 20.65	2.2352	27 43 11.0	1.679
8	5 9 34.82	2.2372	27 44 47.7	1.545
9	5 11 49.11	2.2392	27 46 16.4	1.411
10	5 14 3.52	2.2411	27 47 37.0	1.276
11	5 16 18.04	2.2428	27 48 49.5	1.140
12	5 18 32.66	2.2446	27 49 53.9	1.005
13	5 20 47.39	2.2463	27 50 50.1	0.869
14	5 23 2.22	2.2479	27 51 38.2	0.733
15	5 25 17.14	2.2495	27 52 18.1	0.597
16	5 27 32.16	2.2510	27 52 49.8	0.459
17	5 29 47.26	2.2524	27 53 13.2	0.322
18	5 32 2.45	2.2538	27 53 28.4	0.185
19	5 34 17.72	2.2552	27 53 35.4	+0.048
20	5 36 33.07	2.2563	27 53 34.1	−0.090
21	5 38 48.48	2.2575	27 53 24.6	0.228
22	5 41 3.97	2.2587	27 53 6.8	0.366
23	5 43 19.52	2.2597	27 52 40.7	0.505
24	5 45 35.13	2.2607	N. 27 52 6.2	0.643

TUESDAY 23.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	5 45 35.13	2.2607	N. 27 52 6.2	0.643
1	5 47 50.80	2.2616	27 51 23.5	0.782
2	5 50 6.52	2.2623	27 50 32.4	0.921
3	5 52 22.28	2.2631	27 49 33.0	1.059
4	5 54 38.09	2.2638	27 48 25.3	1.198
5	5 56 53.93	2.2643	27 47 9.2	1.338
6	5 59 9.81	2.2649	27 45 44.7	1.478
7	6 1 25.72	2.2654	27 44 11.9	1.617
8	6 3 41.66	2.2658	27 42 30.7	1.756
9	6 5 57.62	2.2662	27 40 41.2	1.896
10	6 8 13.60	2.2665	27 38 43.2	2.036
11	6 10 29.60	2.2667	27 36 36.9	2.175
12	6 12 45.60	2.2668	27 34 22.2	2.315
13	6 15 1.61	2.2668	27 31 59.1	2.455
14	6 17 17.62	2.2668	27 29 27.6	2.594
15	6 19 33.63	2.2667	27 26 47.8	2.733
16	6 21 49.63	2.2667	27 23 59.6	2.873
17	6 24 5.63	2.2665	27 21 3.0	3.013
18	6 26 21.61	2.2663	27 17 58.0	3.153
19	6 28 37.58	2.2659	27 14 44.6	3.293
20	6 30 53.52	2.2655	27 11 22.9	3.432
21	6 33 9.44	2.2651	27 7 52.8	3.572
22	6 35 25.33	2.2646	27 4 14.3	3.711
23	6 37 41.19	2.2640	N. 27 0 27.5	3.850

WEDNESDAY 24.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	6 39 57.01	2.2633	N. 26 56 32.3	3.989
1	6 42 12.79	2.2627	26 52 28.8	4.128
2	6 44 28.53	2.2619	26 48 17.0	4.267
3	6 46 44.22	2.2611	26 43 56.8	4.405
4	6 48 59.86	2.2603	26 39 28.4	4.543
5	6 51 15.45	2.2593	26 34 51.7	4.681
6	6 53 30.98	2.2583	26 30 6.7	4.819
7	6 55 46.45	2.2573	26 25 13.4	4.957
8	6 58 1.85	2.2562	26 20 11.9	5.094
9	7 0 17.19	2.2551	26 15 2.1	5.232
10	7 2 32.46	2.2539	26 9 44.1	5.369
11	7 4 47.66	2.2527	26 4 17.8	5.506
12	7 7 2.78	2.2513	25 58 43.4	5.642
13	7 9 17.82	2.2500	25 53 0.8	5.778
14	7 11 32.78	2.2487	25 47 10.0	5.914
15	7 13 47.66	2.2473	25 41 11.1	6.049
16	7 16 2.45	2.2457	25 35 4.1	6.184
17	7 18 17.14	2.2441	25 28 49.0	6.319
18	7 20 31.74	2.2426	25 22 25.8	6.454
19	7 22 46.25	2.2410	25 15 54.5	6.588
20	7 25 0.66	2.2393	25 9 15.2	6.722
21	7 27 14.97	2.2377	25 2 27.9	6.855
22	7 29 29.18	2.2359	24 55 32.6	6.988
23	7 31 43.28	2.2342	24 48 29.3	7.121
24	7 33 57.28	2.2324	N. 24 41 18.1	7.253

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 25.					**SATURDAY 27.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	7 33 57.28	2.2324	N. 24 41 18.1	7.253	0	9 18 42.95	2.1328	N. 16 31 44.4	12.880
1	7 36 11.17	2.2306	24 33 59.0	7.384	1	9 20 50.87	2.1311	16 18 48.6	12.978
2	7 38 24.95	2.2287	24 26 32.0	7.515	2	9 22 58.68	2.1293	16 5 47.0	13.076
3	7 40 38.61	2.2268	24 18 57.2	7.646	3	9 25 6.39	2.1277	15 52 39.5	13.173
4	7 42 52.16	2.2248	24 11 14.5	7.777	4	9 27 14.00	2.1260	15 39 26.3	13.268
5	7 45 5.59	2.2229	24 3 24.0	7.907	5	9 29 21.51	2.1243	15 26 7.3	13.363
6	7 47 18.91	2.2210	23 55 25.7	8.036	6	9 31 28.92	2.1228	15 12 42.7	13.456
7	7 49 32.11	2.2190	23 47 19.7	8.164	7	9 33 36.24	2.1212	14 59 12.6	13.548
8	7 51 45.19	2.2169	23 39 6.0	8.293	8	9 35 43.46	2.1196	14 45 36.9	13.641
9	7 53 58.14	2.2148	23 30 44.6	8.420	9	9 37 50.59	2.1181	14 31 55.7	13.732
10	7 56 10.97	2.2128	23 22 15.6	8.548	10	9 39 57.63	2.1167	14 18 9.1	13.821
11	7 58 23.68	2.2108	23 13 38.9	8.674	11	9 42 4.59	2.1153	14 4 17.2	13.908
12	8 0 36.26	2.2086	23 4 54.7	8.800	12	9 44 11.47	2.1140	13 50 20.1	13.996
13	8 2 48.71	2.2065	22 56 2.9	8.926	13	9 46 18.27	2.1127	13 36 17.7	14.083
14	8 5 1.04	2.2043	22 47 3.6	9.050	14	9 48 24.99	2.1114	13 22 10.1	14.168
15	8 7 13.23	2.2022	22 37 56.9	9.174	15	9 50 31.64	2.1103	13 7 57.5	14.252
16	8 9 25.30	2.2001	22 28 42.7	9.297	16	9 52 38.22	2.1091	12 53 39.9	14.335
17	8 11 37.24	2.1979	22 19 21.1	9.422	17	9 54 44.73	2.1079	12 39 17.3	14.418
18	8 13 49.05	2.1957	22 9 52.1	9.545	18	9 56 51.17	2.1068	12 24 49.7	14.500
19	8 16 0.72	2.1934	22 0 15.7	9.667	19	9 58 57.55	2.1058	12 10 17.3	14.579
20	8 18 12.26	2.1913	21 50 32.1	9.788	20	10 1 3.87	2.1049	11 55 40.2	14.658
21	8 20 23.67	2.1891	21 40 41.2	9.908	21	10 3 10.14	2.1040	11 40 58.4	14.735
22	8 22 34.95	2.1869	21 30 43.1	10.028	22	10 5 16.35	2.1031	11 26 12.0	14.812
23	8 24 46.10	2.1848	N. 21 20 37.9	10.147	23	10 7 22.51	2.1023	N. 11 11 21.0	14.888
	FRIDAY 26.					**SUNDAY 28.**			
0	8 26 57.12	2.1825	N. 21 10 25.5	10.266	0	10 9 28.62	2.1016	N. 10 56 25.5	14.962
1	8 29 8.00	2.1803	21 0 6.0	10.383	1	10 11 34.70	2.1009	10 41 25.6	15.035
2	8 31 18.75	2.1781	20 49 39.5	10.500	2	10 13 40.73	2.1003	10 26 21.3	15.107
3	8 33 29.37	2.1758	20 39 6.0	10.617	3	10 15 46.73	2.0998	10 11 12.8	15.178
4	8 35 39.85	2.1736	20 28 25.5	10.733	4	10 17 52.70	2.0993	9 56 0.0	15.248
5	8 37 50.20	2.1714	20 17 38.0	10.849	5	10 19 58.64	2.0988	9 40 43.1	15.316
6	8 40 0.42	2.1693	20 6 43.7	10.962	6	10 22 4.55	2.0983	9 25 22.1	15.383
7	8 42 10.51	2.1671	19 55 42.6	11.075	7	10 24 10.44	2.0981	9 9 57.2	15.448
8	8 44 20.47	2.1649	19 44 34.7	11.188	8	10 26 16.32	2.0978	8 54 28.3	15.513
9	8 46 30.30	2.1628	19 33 20.0	11.300	9	10 28 22.18	2.0977	8 38 55.6	15.577
10	8 48 40.00	2.1607	19 21 58.7	11.411	10	10 30 28.04	2.0976	8 23 19.1	15.639
11	8 50 49.58	2.1586	19 10 30.7	11.522	11	10 32 33.89	2.0974	8 7 38.9	15.700
12	8 52 59.03	2.1564	18 58 56.1	11.631	12	10 34 39.73	2.0974	7 51 55.1	15.759
13	8 55 8.35	2.1543	18 47 15.0	11.740	13	10 36 45.58	2.0975	7 36 7.8	15.818
14	8 57 17.55	2.1523	18 35 27.3	11.848	14	10 38 51.43	2.0976	7 20 17.0	15.874
15	8 59 26.62	2.1502	18 23 33.2	11.955	15	10 40 57.29	2.0978	7 4 22.9	15.929
16	9 1 35.57	2.1482	18 11 32.7	12.062	16	10 43 3.16	2.0980	6 48 25.5	15.984
17	9 3 44.40	2.1462	17 59 25.8	12.167	17	10 45 9.05	2.0984	6 32 24.8	16.037
18	9 5 53.11	2.1442	17 47 12.7	12.271	18	10 47 14.97	2.0988	6 16 21.0	16.088
19	9 8 1.70	2.1423	17 34 53.3	12.375	19	10 49 20.91	2.0993	6 0 14.2	16.138
20	9 10 10.18	2.1403	17 22 27.7	12.478	20	10 51 26.88	2.0998	5 44 4.4	16.188
21	9 12 18.54	2.1384	17 9 56.0	12.580	21	10 53 32.88	2.1003	5 27 51.7	16.235
22	9 14 26.79	2.1366	16 57 18.1	12.682	22	10 55 38.92	2.1011	5 11 36.2	16.281
23	9 16 34.93	2.1347	16 44 34.2	12.781	23	10 57 45.01	2.1019	4 55 18.0	16.325
24	9 18 42.95	2.1328	N. 16 31 44.4	12.880	24	10 59 51.15	2.1028	N. 4 38 57.2	16.368

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 29.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	10 59 51.15	2.1028	N. 4 38 57.2	16.368
1	11 1 57.34	2.1036	4 22 33.8	16.410
2	11 4 3.58	2.1045	4 6 8.0	16.450
3	11 6 9.88	2.1056	3 49 39.8	16.489
4	11 8 16.25	2.1068	3 33 9.3	16.527
5	11 10 22.69	2.1079	3 16 36.6	16.563
6	11 12 29.20	2.1092	3 0 1.8	16.597
7	11 14 35.79	2.1106	2 43 25.0	16.630
8	11 16 42.47	2.1120	2 26 46.2	16.662
9	11 18 49.23	2.1134	2 10 5.6	16.691
10	11 20 56.08	2.1150	1 53 23.3	16.719
11	11 23 3.03	2.1167	1 36 39.3	16.746
12	11 25 10.08	2.1183	1 19 53.8	16.770
13	11 27 17.23	2.1202	1 3 6.9	16.793
14	11 29 24.50	2.1221	0 46 18.6	16.816
15	11 31 31.88	2.1240	0 29 29.0	16.836
16	11 33 39.38	2.1261	N. 0 12 38.3	16.855
17	11 35 47.01	2.1282	S. 0 4 13.6	16.873
18	11 37 54.76	2.1303	0 21 6.4	16.887
19	11 40 2.65	2.1327	0 38 0.0	16.900
20	11 42 10.68	2.1350	0 54 54.4	16.913
21	11 44 18.85	2.1373	1 11 49.5	16.923
22	11 46 27.16	2.1398	1 28 45.2	16.932
23	11 48 35.63	2.1425	S. 1 45 41.3	16.938

TUESDAY 30.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	11 50 44.26	2.1452	S. 2 2 37.8	16.943
1	11 52 53.05	2.1479	2 19 34.5	16.947
2	11 55 2.01	2.1508	2 36 31.4	16.948
3	11 57 11.14	2.1536	2 53 28.3	16.948
4	11 59 20.44	2.1566	3 10 25.2	16.947
5	12 1 29.93	2.1597	3 27 21.9	16.943
6	12 3 39.60	2.1628	3 44 18.4	16.938
7	12 5 49.46	2.1660	4 1 14.4	16.930
8	12 7 59.52	2.1693	4 18 10.0	16.922
9	12 10 9.77	2.1726	4 35 5.0	16.911
10	12 12 20.23	2.1761	4 51 59.3	16.898
11	12 14 30.90	2.1797	5 8 52.7	16.883
12	12 16 41.79	2.1833	5 25 45.2	16.867
13	12 18 52.89	2.1869	5 42 36.7	16.848
14	12 21 4.22	2.1907	5 59 27.0	16.828
15	12 23 15.77	2.1945	6 16 16.0	16.806
16	12 25 27.56	2.1984	6 33 3.7	16.783
17	12 27 39.58	2.2024	6 49 49.9	16.757
18	12 29 51.85	2.2065	7 6 34.5	16.729
19	12 32 4.36	2.2106	7 23 17.4	16.699
20	12 34 17.12	2.2148	7 39 58.4	16.667
21	12 36 30.13	2.2190	7 56 37.4	16.633
22	12 38 43.40	2.2234	8 13 14.4	16.598
23	12 40 56.94	2.2278	8 29 49.2	16.561
24	12 43 10.74	2.2323	S. 8 46 21.7	16.522

WEDNESDAY 31.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	12 43 10.74	2.2323	S. 8 46 21.7	16.522
1	12 45 24.82	2.2369	9 2 51.8	16.480
2	12 47 39.17	2.2415	9 19 19.3	16.436
3	12 49 53.80	2.2462	9 35 44.1	16.391
4	12 52 8.71	2.2509	9 52 6.2	16.343
5	12 54 23.91	2.2558	10 8 25.3	16.293
6	12 56 39.41	2.2608	10 24 41.4	16.242
7	12 58 55.20	2.2657	10 40 54.3	16.188
8	13 1 11.29	2.2708	10 57 3.9	16.133
9	13 3 27.69	2.2758	11 13 10.2	16.076
10	13 5 44.39	2.2809	11 29 13.0	16.016
11	13 8 1.40	2.2862	11 45 12.1	15.953
12	13 10 18.73	2.2915	12 1 7.4	15.890
13	13 12 36.38	2.2968	12 16 58.9	15.824
14	13 14 54.35	2.3022	12 32 46.3	15.756
15	13 17 12.64	2.3076	12 48 29.6	15.686
16	13 19 31.26	2.3131	13 4 8.6	15.613
17	13 21 50.21	2.3187	13 19 43.2	15.539
18	13 24 9.50	2.3243	13 35 13.3	15.463
19	13 26 29.13	2.3299	13 50 38.8	15.385
20	13 28 49.09	2.3356	14 5 59.5	15.304
21	13 31 9.40	2.3413	14 21 15.3	15.222
22	13 33 30.05	2.3471	14 36 26.1	15.137
23	13 35 51.05	2.3529	S. 14 51 31.7	15.050

THURSDAY APRIL 1.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	13 38 12.40	2.3588	S. 15 6 32.1	14.962

PHASES OF THE MOON.

			d	h	m
○	Full Moon	Mar.	1	6	32.6
☾	Last Quarter		8	0	27.6
●	New Moon		15	7	42.3
☽	First Quarter		23	10	48.0
○	Full Moon		30	17	37.7

			d	h
☾	Perigee	Mar.	4	15.0
☾	Apogee		20	13.2

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		True Longitude.		Diff. for 1 Hour.	Latitude.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	91	10 41 22.3	41 0.3	147.93	−0.37	9.999 7495	+52.6	23 21 6.61
2	92	11 40 31.6	40 9.6	147.85	0.42	9.999 8761	52.9	23 17 10.70
3	93	12 39 39.1	39 17.0	147.77	0.44	0.000 0032	53.1	23 13 14.79
4	94	13 38 44.8	38 22.6	147.70	−0.42	0.000 1308	+53.2	23 9 18.89
5	95	14 37 48.7	37 26.4	147.62	0.37	0.000 2586	53.2	23 5 22.98
6	96	15 36 50.9	36 28.4	147.55	0.30	0.000 3864	53.2	23 1 27.07
7	97	16 35 51.4	35 28.8	147.48	−0.19	0.000 5140	+53.1	22 57 31.16
8	98	17 34 50.1	34 27.4	147.41	−0.07	0.000 6414	52.9	22 53 35.25
9	99	18 33 47.1	33 24.2	147.34	+0.06	0.000 7683	52.7	22 49 39.35
10	100	19 32 42.2	32 19.3	147.26	+0.19	0.000 8946	+52.4	22 45 43.44
11	101	20 31 35.6	31 12.5	147.19	0.31	0.001 0202	52.1	22 41 47.53
12	102	21 30 27.1	30 3.9	147.11	0.44	0.001 1449	51.8	22 37 51.62
13	103	22 29 16.8	28 53.4	147.03	+0.53	0.001 2686	+51.4	22 33 55.71
14	104	23 28 4.4	27 41.0	146.95	0.61	0.001 3914	50.9	22 29 59.80
15	105	24 26 50.1	26 26.6	146.87	0.67	0.001 5132	50.5	22 26 3.90
16	106	25 25 33.8	25 10.1	146.78	+0.70	0.001 6339	+50.1	22 22 7.99
17	107	26 24 15.4	23 51.6	146.69	0.70	0.001 7536	49.7	22 18 12.08
18	108	27 22 54.9	22 31.0	146.60	0.68	0.001 8723	49.2	22 14 16.17
19	109	28 21 32.2	21 8.2	146.51	+0.64	0.001 9900	+48.8	22 10 20.26
20	110	29 20 7.5	19 43.3	146.42	0.57	0.002 1067	48.4	22 6 24.35
21	111	30 18 40.5	18 16.2	146.33	0.48	0.002 2225	48.1	22 2 28.44
22	112	31 17 11.4	16 47.0	146.24	+0.36	0.002 3375	+47.7	21 58 32.53
23	113	32 15 40.2	15 15.6	146.15	0.23	0.002 4517	47.4	21 54 36.62
24	114	33 14 6.7	13 42.0	146.06	+0.10	0.002 5652	47.2	21 50 40.72
25	115	34 12 31.1	12 6.3	145.97	−0.03	0.002 6782	+47.0	21 46 44.81
26	116	35 10 53.4	10 28.4	145.89	0.15	0.002 7906	46.8	21 42 48.90
27	117	36 9 13.7	8 48.6	145.80	0.25	0.002 9027	46.6	21 38 52.99
28	118	37 7 32.0	7 6.7	145.72	−0.33	0.003 0144	+46.5	21 34 57.08
29	119	38 5 48.3	5 23.0	145.64	0.38	0.003 1259	46.4	21 31 1.17
30	120	39 4 2.9	3 37.4	145.57	0.40	0.003 2371	46.3	21 27 5.26
31	121	40 2 15.8	1 50.1	145.50	−0.38	0.003 3479	+46.1	21 23 9.35

NOTE.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,
$-9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

THE MOON'S

Day of the Month.	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 33.2	16 33.7	60 39.21	+0.329	60 41.11	−0.011	13 33.5	2.37	16.7
2	16 33.2	16 31.5	60 39.00	−0.338	60 33.10	0.640	14 32.2	2.52	17.7
3	16 29.0	16 25.6	60 23.76	0.910	60 11.40	1.143	15 34.3	2.63	18.7
4	16 21.6	16 16.9	59 56.49	−1.336	59 39.50	−1.488	16 37.9	2.64	19.7
5	16 11.9	16 6.5	59 20.95	1.598	59 1.31	1.670	17 40.1	2.53	20.7
6	16 1.0	15 55.4	58 41.01	1.708	58 20.44	1.716	18 38.8	2.35	21.7
7	15 49.8	15 44.3	57 59.93	−1.699	57 39.73	−1.665	19 32.7	2.14	22.7
8	15 38.9	15 33.7	57 20.03	1.616	57 1.00	1.555	20 22.0	1.97	23.7
9	15 28.8	15 24.0	56 42.74	1.487	56 25.32	1.416	21 7.4	1.83	24.7
10	15 19.5	15 15.2	56 8.78	−1.341	55 53.14	−1.266	21 50.3	1.75	25.7
11	15 11.2	15 7.4	55 38.40	1.192	55 24.54	1.118	22 31.7	1.71	26.7
12	15 3.9	15 0.6	55 11.57	1.043	54 59.52	0.966	23 12.8	1.72	27.7
13	14 57.6	14 54.8	54 48.40	−0.888	54 38.22	−0.808	23 54.5	1.76	28.7
14	14 52.3	14 50.1	54 29.02	0.723	54 20.89	0.631	☌	. .	0.0
15	14 48.2	14 46.6	54 13.91	0.531	54 8.17	0.424	0 37.7	1.84	1.0
16	14 45.4	14 44.6	54 3.78	−0.306	54 0.86	−0.179	1 23.0	1.94	2.0
17	14 44.3	14 44.4	53 59.53	−0.041	53 59.92	+0.109	2 10.7	2.03	3.0
18	14 45.0	14 46.2	54 2.18	+0.270	54 6.43	0.440	3 0.4	2.10	4.0
19	14 47.9	14 50.2	54 12.77	+0.618	54 21.30	+0.805	3 51.5	2.14	5.0
20	14 53.2	14 56.8	54 32.11	0.998	54 45.26	1.195	4 43.0	2.14	6.0
21	15 1.0	15 5.8	55 0.79	1.392	55 18.66	1.585	5 33.9	2.10	7.0
22	15 11.3	15 17.4	55 38.80	+1.771	56 1.11	+1.945	6 23.5	2.03	8.0
23	15 24.0	15 31.1	56 25.40	2.101	56 51.43	2.233	7 11.6	1.98	9.0
24	15 38.6	15 46.4	57 18.87	2.335	57 47.33	2.402	7 58.7	1.95	10.0
25	15 54.3	16 2.2	58 16.33	+2.424	58 45.30	+2.396	8 45.5	1.96	11.0
26	16 9.9	16 17.2	59 13.61	2.313	59 40.57	2.170	9 33.2	2.02	12.0
27	16 24.0	16 30.0	60 5.46	1.969	60 27.59	1.710	10 23.1	2.14	13.0
28	16 35.1	16 39.1	60 46.29	+1.398	61 0.97	+1.042	11 16.5	2.31	14.0
29	16 41.9	16 43.4	61 11.17	+0.654	61 16.60	+0.248	12 14.4	2.51	15.0
30	16 43.5	16 42.3	61 17.11	−0.163	61 12.74	−0.562	13 16.9	2.68	16.0
31	16 39.9	16 36.3	61 3.74	−0.933	60 50.50	−1.266	14 22.4	2.75	17.0

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S True Longitude. λ	THE SUN'S True Longitude. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S Latitude.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	91	10 41 22.3	41 0.3	147.93	−0.37	9.999 7495	+52.6	23 21 6.61
2	92	11 40 31.6	40 9.6	147.85	0.42	9.999 8761	52.9	23 17 10.70
3	93	12 39 39.1	39 17.0	147.77	0.44	0.000 0032	53.1	23 13 14.79
4	94	13 38 44.8	38 22.6	147.70	−0.42	0.000 1308	+53.2	23 9 18.89
5	95	14 37 48.7	37 26.4	147.62	0.37	0.000 2586	53.2	23 5 22.98
6	96	15 36 50.9	36 28.4	147.55	0.30	0.000 3864	53.2	23 1 27.07
7	97	16 35 51.4	35 28.8	147.48	−0.19	0.000 5140	+53.1	22 57 31.16
8	98	17 34 50.1	34 27.4	147.41	−0.07	0.000 6414	52.9	22 53 35.25
9	99	18 33 47.1	33 24.2	147.34	+0.06	0.000 7683	52.7	22 49 39.35
10	100	19 32 42.2	32 19.3	147.26	+0.19	0.000 8946	+52.4	22 45 43.44
11	101	20 31 35.6	31 12.5	147.19	0.31	0.001 0202	52.1	22 41 47.53
12	102	21 30 27.1	30 3.9	147.11	0.44	0.001 1449	51.8	22 37 51.62
13	103	22 29 16.8	28 53.4	147.03	+0.53	0.001 2686	+51.4	22 33 55.71
14	104	23 28 4.4	27 41.0	146.95	0.61	0.001 3914	50.9	22 29 59.80
15	105	24 26 50.1	26 26.6	146.87	0.67	0.001 5132	50.5	22 26 3.90
16	106	25 25 33.8	25 10.1	146.78	+0.70	0.001 6339	+50.1	22 22 7.99
17	107	26 24 15.4	23 51.6	146.69	0.70	0.001 7536	49.7	22 18 12.08
18	108	27 22 54.9	22 31.0	146.60	0.68	0.001 8723	49.2	22 14 16.17
19	109	28 21 32.2	21 8.2	146.51	+0.64	0.001 9900	+48.8	22 10 20.26
20	110	29 20 7.5	19 43.3	146.42	0.57	0.002 1067	48.4	22 6 24.35
21	111	30 18 40.5	18 16.2	146.33	0.48	0.002 2225	48.1	22 2 28.44
22	112	31 17 11.4	16 47.0	146.24	+0.36	0.002 3375	+47.7	21 58 32.53
23	113	32 15 40.2	15 15.6	146.15	0.23	0.002 4517	47.4	21 54 36.62
24	114	33 14 6.7	13 42.0	146.06	+0.10	0.002 5652	47.2	21 50 40.72
25	115	34 12 31.1	12 6.3	145.97	−0.03	0.002 6782	+47.0	21 46 44.81
26	116	35 10 53.4	10 28.4	145.89	0.15	0.002 7906	46.8	21 42 48.90
27	117	36 9 13.7	8 48.6	145.80	0.25	0.002 9027	46.6	21 38 52.99
28	118	37 7 32.0	7 6.7	145.72	−0.33	0.003 0144	+46.5	21 34 57.08
29	119	38 5 48.3	5 23.0	145.64	0.38	0.003 1259	46.4	21 31 1.17
30	120	39 4 2.9	3 37.4	145.57	0.40	0.003 2371	46.3	21 27 5.26
31	121	40 2 15.8	1 50.1	145.50	−0.38	0.003 3479	+46.1	21 23 9.35

NOTE.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,
−9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 33.2	16 33.7	60 39.21	+0.329	60 41.11	−0.011	13 33.5	2.37	16.7
2	16 33.2	16 31.5	60 39.00	−0.338	60 33.10	0.640	14 32.2	2.52	17.7
3	16 29.0	16 25.6	60 23.76	0.910	60 11.40	1.143	15 34.3	2.63	18.7
4	16 21.6	16 16.9	59 56.49	−1.336	59 39.50	−1.488	16 37.9	2.64	19.7
5	16 11.9	16 6.5	59 20.95	1.598	59 1.31	1.670	17 40.1	2.53	20.7
6	16 1.0	15 55.4	58 41.01	1.708	58 20.44	1.716	18 38.8	2.35	21.7
7	15 49.8	15 44.3	57 59.93	−1.699	57 39.73	−1.665	19 32.7	2.14	22.7
8	15 38.9	15 33.7	57 20.03	1.616	57 1.00	1.555	20 22.0	1.97	23.7
9	15 28.8	15 24.0	56 42.74	1.487	56 25.32	1.416	21 7.4	1.83	24.7
10	15 19.5	15 15.2	56 8.78	−1.341	55 53.14	−1.266	21 50.3	1.75	25.7
11	15 11.2	15 7.4	55 38.40	1.192	55 24.54	1.118	22 31.7	1.71	26.7
12	15 3.9	15 0.6	55 11.57	1.043	54 59.52	0.966	23 12.8	1.72	27.7
13	14 57.6	14 54.8	54 48.40	−0.888	54 38.22	−0.808	23 54.5	1.76	28.7
14	14 52.3	14 50.1	54 29.02	0.723	54 20.89	0.631	6	. .	0.0
15	14 48.2	14 46.6	54 13.91	0.531	54 8.17	0.424	0 37.7	1.84	1.0
16	14 45.4	14 44.6	54 3.78	−0.306	54 0.86	−0.179	1 23.0	1.94	2.0
17	14 44.3	14 44.4	53 59.53	−0.041	53 59.92	+0.109	2 10.7	2.03	3.0
18	14 45.0	14 46.2	54 2.18	+0.270	54 6.43	0.440	3 0.4	2.10	4.0
19	14 47.9	14 50.2	54 12.77	+0.618	54 21.30	+0.805	3 51.5	2.14	5.0
20	14 53.2	14 56.8	54 32.11	0.998	54 45.26	1.195	4 43.0	2.14	6.0
21	15 1.0	15 5.8	55 0.79	1.392	55 18.66	1.585	5 33.9	2.10	7.0
22	15 11.3	15 17.4	55 38.80	+1.771	56 1.11	+1.945	6 23.5	2.03	8.0
23	15 24.0	15 31.1	56 25.40	2.101	56 51.43	2.233	7 11.6	1.98	9.0
24	15 38.6	15 46.4	57 18.87	2.335	57 47.33	2.402	7 58.7	1.95	10.0
25	15 54.3	16 2.2	58 16.33	+2.424	58 45.30	+2.396	8 45.5	1.96	11.0
26	16 9.9	16 17.2	59 13.61	2.313	59 40.57	2.170	9 33.2	2.02	12.0
27	16 24.0	16 30.0	60 5.46	1.969	60 27.59	1.710	10 23.1	2.14	13.0
28	16 35.1	16 39.1	60 46.29	+1.398	61 0.97	+1.042	11 16.5	2.31	14.0
29	16 41.9	16 43.4	61 11.17	+0.654	61 16.60	+0.248	12 14.4	2.51	15.0
30	16 43.5	16 42.3	61 17.11	−0.163	61 12.74	−0.562	13 16.9	2.68	16.0
31	16 39.9	16 36.3	61 3.74	−0.933	60 50.50	−1.266	14 22.4	2.75	17.0

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 1.					SATURDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	13 38 12.40	2.3588	S. 15 6 32.1	14.962	0	15 38 19.86	2.6353	S. 24 44 5.6	8.389
1	13 40 34.10	2.3647	15 21 27.1	14.871	1	15 40 58.11	2.6396	24 52 23.6	8.210
2	13 42 56.16	2.3707	15 36 16.6	14.778	2	15 43 36.61	2.6438	25 0 30.8	8.030
3	13 45 18.58	2.3767	15 51 0.4	14.683	3	15 46 15.36	2.6479	25 8 27.2	7.849
4	13 47 41.36	2.3827	16 5 38.5	14.586	4	15 48 54.36	2.6519	25 16 12.7	7.668
5	13 50 4.50	2.3887	16 20 10.7	14.487	5	15 51 33.59	2.6558	25 23 47.3	7.484
6	13 52 28.00	2.3947	16 34 36.9	14.385	6	15 54 13.05	2.6596	25 31 10.8	7.299
7	13 54 51.86	2.4008	16 48 56.9	14.282	7	15 56 52.74	2.6633	25 38 23.2	7.114
8	13 57 16.09	2.4069	17 3 10.7	14.177	8	15 59 32.64	2.6667	25 45 24.5	6.928
9	13 59 40.69	2.4130	17 17 18.1	14.069	9	16 2 12.74	2.6700	25 52 14.6	6.741
10	14 2 5.65	2.4191	17 31 19.0	13.959	10	16 4 53.04	2.6732	25 58 53.4	6.552
11	14 4 30.98	2.4253	17 45 13.2	13.848	11	16 7 33.52	2.6763	26 5 20.8	6.363
12	14 6 56.68	2.4314	17 59 0.7	13.734	12	16 10 14.19	2.6793	26 11 36.9	6.173
13	14 9 22.75	2.4376	18 12 41.3	13.618	13	16 12 55.03	2.6820	26 17 41.5	5.981
14	14 11 49.19	2.4438	18 26 14.9	13.501	14	16 15 36.03	2.6847	26 23 34.6	5.789
15	14 14 16.00	2.4499	18 39 41.4	13.381	15	16 18 17.19	2.6872	26 29 16.2	5.597
16	14 16 43.18	2.4562	18 53 0.6	13.259	16	16 20 58.49	2.6894	26 34 46.2	5.403
17	14 19 10.74	2.4623	19 6 12.5	13.135	17	16 23 39.92	2.6915	26 40 4.6	5.210
18	14 21 38.66	2.4685	19 19 16.8	13.009	18	16 26 21.47	2.6935	26 45 11.4	5.016
19	14 24 6.96	2.4747	19 32 13.6	12.882	19	16 29 3.14	2.6954	26 50 6.5	4.820
20	14 26 35.62	2.4808	19 45 2.6	12.752	20	16 31 44.92	2.6971	26 54 49.8	4.624
21	14 29 4.66	2.4870	19 57 43.8	12.620	21	16 34 26.79	2.6986	26 59 21.4	4.428
22	14 31 34.06	2.4931	20 10 17.0	12.486	22	16 37 8.75	2.6999	27 3 41.2	4.232
23	14 34 3.83	2.4992	S. 20 22 42.1	12.350	23	16 39 50.78	2.7011	S. 27 7 49.2	4.035
	FRIDAY 2.					SUNDAY 4.			
0	14 36 33.96	2.5053	S. 20 34 59.0	12.213	0	16 42 32.88	2.7022	S. 27 11 45.4	3.838
1	14 39 4.46	2.5113	20 47 7.6	12.073	1	16 45 15.04	2.7030	27 15 29.7	3.639
2	14 41 35.32	2.5173	20 59 7.8	11.932	2	16 47 57.24	2.7036	27 19 2.1	3.441
3	14 44 6.54	2.5233	21 10 59.4	11.788	3	16 50 39.47	2.7041	27 22 22.6	3.243
4	14 46 38.12	2.5293	21 22 42.4	11.643	4	16 53 21.73	2.7044	27 25 31.3	3.046
5	14 49 10.06	2.5353	21 34 16.6	11.497	5	16 56 4.00	2.7045	27 28 28.1	2.847
6	14 51 42.35	2.5411	21 45 42.0	11.348	6	16 58 46.27	2.7044	27 31 12.9	2.648
7	14 54 14.99	2.5469	21 56 58.4	11.198	7	17 1 28.53	2.7043	27 33 45.8	2.449
8	14 56 47.98	2.5527	22 8 5.7	11.045	8	17 4 10.78	2.7039	27 36 6.8	2.251
9	14 59 21.31	2.5584	22 19 3.8	10.891	9	17 6 53.00	2.7033	27 38 15.9	2.053
10	15 1 54.99	2.5640	22 29 52.6	10.735	10	17 9 35.18	2.7026	27 40 13.1	1.854
11	15 4 29.00	2.5696	22 40 32.0	10.578	11	17 12 17.31	2.7017	27 41 58.4	1.656
12	15 7 3.34	2.5752	22 51 2.0	10.420	12	17 14 59.38	2.7006	27 43 31.8	1.458
13	15 9 38.02	2.5807	23 1 22.4	10.258	13	17 17 41.38	2.6993	27 44 53.3	1.259
14	15 12 13.02	2.5860	23 11 33.0	10.095	14	17 20 23.29	2.6978	27 46 2.9	1.062
15	15 14 48.34	2.5913	23 21 33.8	9.932	15	17 23 5.11	2.6962	27 47 0.7	0.865
16	15 17 23.98	2.5966	23 31 24.8	9.767	16	17 25 46.83	2.6944	27 47 46.7	0.668
17	15 19 59.93	2.6018	23 41 5.8	9.599	17	17 28 28.44	2.6924	27 48 20.9	0.472
18	15 22 36.19	2.6068	23 50 36.7	9.430	18	17 31 9.92	2.6903	27 48 43.3	0.275
19	15 25 12.75	2.6118	23 59 57.4	9.260	19	17 33 51.27	2.6880	27 48 53.9	−0.079
20	15 27 49.60	2.6167	24 9 7.9	9.088	20	17 36 32.48	2.6855	27 48 52.8	+0.116
21	15 30 26.75	2.6215	24 18 8.0	8.915	21	17 39 13.53	2.6828	27 48 40.0	0.310
22	15 33 4.18	2.6261	24 26 57.7	8.741	22	17 41 54.41	2.6799	27 48 15.6	0.504
23	15 35 41.88	2.6307	24 35 36.9	8.566	23	17 44 35.12	2.6770	27 47 39.5	0.697
24	15 38 19.86	2.6353	S. 24 44 5.6	8.389	24	17 47 15.65	2.6738	S. 27 46 51.9	0.889

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 5.					WEDNESDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 47 15.65	2.6738	S. 27 46 51.9	0.889	0	19 49 28.43	2.3832	S. 23 42 47.3	8.758
1	17 49 55.98	2.6705	27 45 52.8	1.082	1	19 51 51.19	2.3756	23 33 58.0	8.885
2	17 52 36.11	2.6670	27 44 42.1	1.273	2	19 54 13.50	2.3680	23 25 1.1	9.011
3	17 55 16.02	2.6633	27 43 20.0	1.463	3	19 56 35.35	2.3603	23 15 56.7	9.135
4	17 57 55.71	2.6595	27 41 46.5	1.653	4	19 58 56.74	2.3527	23 6 44.9	9.258
5	18 0 35.16	2.6555	27 40 1.7	1.841	5	20 1 17.67	2.3450	22 57 25.8	9.379
6	18 3 14.37	2.6515	27 38 5.6	2.029	6	20 3 38.14	2.3374	22 47 59.4	9.499
7	18 5 53.34	2.6473	27 35 58.2	2.216	7	20 5 58.16	2.3298	22 38 25.9	9.617
8	18 8 32.05	2.6428	27 33 39.7	2.401	8	20 8 17.72	2.3222	22 28 45.4	9.733
9	18 11 10.48	2.6383	27 31 10.1	2.586	9	20 10 36.82	2.3146	22 18 57.9	9.848
10	18 13 48.64	2.6337	27 28 29.4	2.770	10	20 12 55.47	2.3070	22 9 3.6	9.961
11	18 16 26.52	2.6288	27 25 37.7	2.953	11	20 15 13.66	2.2993	21 59 2.6	10.073
12	18 19 4.10	2.6238	27 22 35.1	3.134	12	20 17 31.39	2.2918	21 48 54.9	10.183
13	18 21 41.38	2.6188	27 19 21.6	3.315	13	20 19 48.68	2.2843	21 38 40.7	10.291
14	18 24 18.35	2.6135	27 15 57.3	3.494	14	20 22 5.51	2.2768	21 28 20.0	10.398
15	18 26 55.00	2.6082	27 12 22.3	3.672	15	20 24 21.89	2.2693	21 17 53.0	10.503
16	18 29 31.33	2.6028	27 8 36.7	3.848	16	20 26 37.82	2.2618	21 7 19.7	10.606
17	18 32 7.33	2.5972	27 4 40.5	4.025	17	20 28 53.31	2.2544	20 56 40.3	10.708
18	18 34 42.99	2.5914	27 0 33.7	4.199	18	20 31 8.35	2.2470	20 45 54.8	10.808
19	18 37 18.30	2.5856	26 56 16.6	4.372	19	20 33 22.95	2.2397	20 35 3.3	10.907
20	18 39 53.26	2.5797	26 51 49.1	4.543	20	20 35 37.11	2.2323	20 24 6.0	11.004
21	18 42 27.86	2.5737	26 47 11.4	4.714	21	20 37 50.83	2.2250	20 13 2.8	11.101
22	18 45 2.10	2.5676	26 42 23.4	4.884	22	20 40 4.11	2.2177	20 1 53.9	11.194
23	18 47 35.97	2.5613	S. 26 37 25.3	5.052	23	20 42 16.95	2.2104	S. 19 50 39.5	11.287
	TUESDAY 6.					THURSDAY 8.			
0	18 50 9.46	2.5549	S. 26 32 17.2	5.218	0	20 44 29.36	2.2033	S. 19 39 19.5	11.378
1	18 52 42.56	2.5485	26 26 59.2	5.383	1	20 46 41.34	2.1962	19 27 54.1	11.468
2	18 55 15.28	2.5420	26 21 31.3	5.546	2	20 48 52.90	2.1891	19 16 23.4	11.556
3	18 57 47.60	2.5353	26 15 53.7	5.708	3	20 51 4.03	2.1820	19 4 47.4	11.643
4	19 0 19.52	2.5287	26 10 6.3	5.869	4	20 53 14.74	2.1750	18 53 6.2	11.728
5	19 2 51.04	2.5219	26 4 9.4	6.028	5	20 55 25.03	2.1681	18 41 20.0	11.812
6	19 5 22.15	2.5151	25 58 3.0	6.185	6	20 57 34.91	2.1612	18 29 28.8	11.894
7	19 7 52.85	2.5083	25 51 47.2	6.342	7	20 59 44.37	2.1543	18 17 32.7	11.975
8	19 10 23.14	2.5013	25 45 22.0	6.497	8	21 1 53.42	2.1475	18 5 31.8	12.054
9	19 12 53.00	2.4942	25 38 47.6	6.649	9	21 4 2.07	2.1408	17 53 26.2	12.132
10	19 15 22.44	2.4872	25 32 4.1	6.801	10	21 6 10.32	2.1342	17 41 16.0	12.208
11	19 17 51.46	2.4800	25 25 11.5	6.952	11	21 8 18.17	2.1275	17 29 1.2	12.284
12	19 20 20.04	2.4727	25 18 9.9	7.100	12	21 10 25.62	2.1209	17 16 41.9	12.358
13	19 22 48.18	2.4654	25 10 59.5	7.247	13	21 12 32.68	2.1145	17 4 18.3	12.429
14	19 25 15.89	2.4582	25 3 40.3	7.393	14	21 14 39.36	2.1081	16 51 50.4	12.501
15	19 27 43.16	2.4508	24 56 12.4	7.536	15	21 16 45.65	2.1017	16 39 18.2	12.570
16	19 30 9.99	2.4434	24 48 36.0	7.678	16	21 18 51.56	2.0953	16 26 42.0	12.638
17	19 32 36.37	2.4359	24 40 51.1	7.818	17	21 20 57.09	2.0891	16 14 1.7	12.705
18	19 35 2.30	2.4285	24 32 57.8	7.958	18	21 23 2.25	2.0829	16 1 17.4	12.770
19	19 37 27.79	2.4210	24 24 56.2	8.095	19	21 25 7.04	2.0768	15 48 29.3	12.833
20	19 39 52.82	2.4134	24 16 46.4	8.231	20	21 27 11.47	2.0708	15 35 37.4	12.896
21	19 42 17.40	2.4059	24 8 28.5	8.364	21	21 29 15.53	2.0647	15 22 41.8	12.958
22	19 44 41.53	2.3984	24 0 2.7	8.497	22	21 31 19.23	2.0588	15 9 42.5	13.018
23	19 47 5.21	2.3908	23 51 28.9	8.628	23	21 33 22.58	2.0530	14 56 39.6	13.077
24	19 49 28.43	2.3832	S. 23 42 47.3	8.758	24	21 35 25.59	2.0473	S. 14 43 33.3	13.133

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 9.					SUNDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 35 25.59	2.0473	S. 14 43 33.3	13.133	0	23 8 26.46	1.8575	S. 3 29 35.9	14.528
1	21 37 28.25	2.0415	14 30 23.6	13.189	1	23 10 17.85	1.8555	3 15 4.1	14.533
2	21 39 30.57	2.0358	14 17 10.6	13.244	2	23 12 9.12	1.8534	3 0 32.0	14.536
3	21 41 32.55	2.0303	14 3 54.3	13.298	3	23 14 0.26	1.8514	2 45 59.8	14.537
4	21 43 34.20	2.0248	13 50 34.8	13.351	4	23 15 51.29	1.8496	2 31 27.6	14.538
5	21 45 35.53	2.0194	13 37 12.2	13.401	5	23 17 42.21	1.8478	2 16 55.3	14.538
6	21 47 36.53	2.0140	13 23 46.6	13.451	6	23 19 33.03	1.8461	2 2 23.1	14.537
7	21 49 37.21	2.0088	13 10 18.0	13.500	7	23 21 23.74	1.8444	1 47 50.9	14.535
8	21 51 37.58	2.0036	12 56 46.6	13.547	8	23 23 14.36	1.8429	1 33 18.9	14.533
9	21 53 37.64	1.9984	12 43 12.4	13.593	9	23 25 4.89	1.8413	1 18 47.0	14.529
10	21 55 37.39	1.9933	12 29 35.4	13.639	10	23 26 55.32	1.8399	1 4 15.4	14.524
11	21 57 36.84	1.9883	12 15 55.7	13.683	11	23 28 45.68	1.8386	0 49 44.1	14.518
12	21 59 35.99	1.9834	12 2 13.5	13.724	12	23 30 35.95	1.8373	0 35 13.2	14.511
13	22 1 34.85	1.9786	11 48 28.8	13.766	13	23 32 26.15	1.8361	0 20 42.7	14.505
14	22 3 33.42	1.9738	11 34 41.6	13.806	14	23 34 16.28	1.8349	S. 0 6 12.6	14.498
15	22 5 31.71	1.9693	11 20 52.1	13.844	15	23 36 6.34	1.8338	N. 0 8 17.0	14.488
16	22 7 29.73	1.9647	11 7 0.3	13.883	16	23 37 56.34	1.8328	0 22 46.0	14.478
17	22 9 27.47	1.9601	10 53 6.2	13.920	17	23 39 46.28	1.8318	0 37 14.4	14.468
18	22 11 24.94	1.9556	10 39 9.9	13.955	18	23 41 36.16	1.8310	0 51 42.1	14.456
19	22 13 22.14	1.9511	10 25 11.6	13.989	19	23 43 26.00	1.8303	1 6 9.1	14.443
20	22 15 19.08	1.9469	10 11 11.2	14.023	20	23 45 15.79	1.8295	1 20 35.3	14.430
21	22 17 15.77	1.9428	9 57 8.8	14.055	21	23 47 5.54	1.8288	1 35 0.7	14.416
22	22 19 12.21	1.9386	9 43 4.6	14.086	22	23 48 55.25	1.8283	1 49 25.2	14.401
23	22 21 8.40	1.9345	S. 9 28 58.5	14.117	23	23 50 44.93	1.8278	N. 2 3 48.8	14.385
	SATURDAY 10.					MONDAY 12.			
0	22 23 4.35	1.9305	S. 9 14 50.6	14.145	0	23 52 34.58	1.8273	N. 2 18 11.4	14.368
1	22 25 0.06	1.9266	9 0 41.1	14.173	1	23 54 24.20	1.8268	2 32 32.9	14.350
2	22 26 55.54	1.9228	8 46 29.9	14.199	2	23 56 13.80	1.8266	2 46 53.4	14.331
3	22 28 50.79	1.9190	8 32 17.2	14.225	3	23 58 3.39	1.8263	3 1 12.7	14.311
4	22 30 45.82	1.9153	8 18 2.9	14.250	4	23 59 52.96	1.8261	3 15 30.8	14.291
5	22 32 40.63	1.9117	8 3 47.2	14.273	5	0 1 42.53	1.8261	3 29 47.7	14.271
6	22 34 35.22	1.9081	7 49 30.1	14.296	6	0 3 32.09	1.8260	3 44 3.3	14.248
7	22 36 29.60	1.9047	7 35 11.7	14.318	7	0 5 21.65	1.8260	3 58 17.5	14.226
8	22 38 23.78	1.9013	7 20 52.0	14.338	8	0 7 11.21	1.8260	4 12 30.4	14.203
9	22 40 17.76	1.8980	7 6 31.2	14.357	9	0 9 0.77	1.8261	4 26 41.8	14.178
10	22 42 11.54	1.8948	6 52 9.2	14.376	10	0 10 50.35	1.8264	4 40 51.7	14.153
11	22 44 5.13	1.8916	6 37 46.1	14.393	11	0 12 39.94	1.8268	4 55 0.1	14.126
12	22 45 58.53	1.8885	6 23 22.0	14.409	12	0 14 29.56	1.8271	5 9 6.8	14.098
13	22 47 51.75	1.8856	6 8 57.0	14.424	13	0 16 19.20	1.8275	5 23 11.9	14.071
14	22 49 44.80	1.8827	5 54 31.1	14.439	14	0 18 8.86	1.8279	5 37 15.3	14.042
15	22 51 37.67	1.8798	5 40 4.3	14.453	15	0 19 58.55	1.8285	5 51 16.9	14.013
16	22 53 30.37	1.8770	5 25 36.8	14.464	16	0 21 48.28	1.8291	6 5 16.8	13.983
17	22 55 22.91	1.8743	5 11 8.6	14.476	17	0 23 38.05	1.8298	6 19 14.8	13.951
18	22 57 15.29	1.8717	4 56 39.7	14.487	18	0 25 27.86	1.8305	6 33 10.9	13.918
19	22 59 7.51	1.8691	4 42 10.2	14.496	19	0 27 17.71	1.8313	6 47 5.0	13.886
20	23 0 59.58	1.8667	4 27 40.2	14.504	20	0 29 7.61	1.8321	7 0 57.2	13.853
21	23 2 51.51	1.8643	4 13 9.7	14.512	21	0 30 57.57	1.8331	7 14 47.3	13.818
22	23 4 43.30	1.8620	3 58 38.8	14.518	22	0 32 47.58	1.8340	7 28 35.3	13.783
23	23 6 34.95	1.8597	3 44 7.5	14.524	23	0 34 37.65	1.8350	7 42 21.2	13.746
24	23 8 26.46	1.8575	S. 3 29 35.9	14.528	24	0 36 27.78	1.8361	N. 7 56 4.8	13.708

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 13.			
	h m s	s	° ′ ″	″
0	0 36 27.78	1.8361	N. 7 56 4.8	13.708
1	0 38 17.98	1.8373	8 9 46.2	13.671
2	0 40 8.25	1.8385	8 23 25.3	13.633
3	0 41 58.60	1.8398	8 37 2.1	13.593
4	0 43 49.02	1.8411	8 50 36.4	13.552
5	0 45 39.53	1.8425	9 4 8.3	13.512
6	0 47 30.12	1.8439	9 17 37.8	13.470
7	0 49 20.80	1.8454	9 31 4.7	13.426
8	0 51 11.57	1.8469	9 44 28.9	13.383
9	0 53 2.43	1.8485	9 57 50.6	13.338
10	0 54 53.39	1.8502	10 11 9.5	13.293
11	0 56 44.45	1.8519	10 24 25.7	13.247
12	0 58 35.62	1.8537	10 37 39.1	13.199
13	1 0 26.89	1.8555	10 50 49.6	13.152
14	1 2 18.28	1.8574	11 3 57.3	13.103
15	1 4 9.78	1.8593	11 17 2.0	13.053
16	1 6 1.40	1.8613	11 30 3.7	13.003
17	1 7 53.13	1.8633	11 43 2.4	12.952
18	1 9 44.99	1.8654	11 55 57.9	12.899
19	1 11 36.98	1.8676	12 8 50.3	12.847
20	1 13 29.10	1.8698	12 21 39.6	12.794
21	1 15 21.35	1.8719	12 34 25.6	12.739
22	1 17 13.73	1.8742	12 47 8.3	12.684
23	1 19 6.25	1.8766	N. 12 59 47.7	12.628
	WEDNESDAY 14.			
0	1 20 58.92	1.8790	N. 13 12 23.6	12.570
1	1 22 51.73	1.8814	13 24 56.1	12.513
2	1 24 44.69	1.8838	13 37 25.1	12.454
3	1 26 37.79	1.8863	13 49 50.6	12.395
4	1 28 31.05	1.8889	14 2 12.5	12.335
5	1 30 24.46	1.8915	14 14 30.8	12.274
6	1 32 18.03	1.8943	14 26 45.4	12.212
7	1 34 11.77	1.8970	14 38 56.2	12.149
8	1 36 5.67	1.8997	14 51 3.3	12.086
9	1 37 59.73	1.9024	15 3 6.5	12.022
10	1 39 53.96	1.9053	15 15 5.9	11.957
11	1 41 48.36	1.9081	15 27 1.3	11.890
12	1 43 42.93	1.9110	15 38 52.7	11.823
13	1 45 37.68	1.9139	15 50 40.1	11.756
14	1 47 32.60	1.9169	16 2 23.4	11.688
15	1 49 27.71	1.9200	16 14 2.6	11.618
16	1 51 23.00	1.9230	16 25 37.6	11.548
17	1 53 18.47	1.9261	16 37 8.3	11.477
18	1 55 14.13	1.9293	16 48 34.8	11.405
19	1 57 9.98	1.9323	16 59 56.9	11.333
20	1 59 6.01	1.9355	17 11 14.7	11.259
21	2 1 2.24	1.9388	17 22 28.0	11.185
22	2 2 58.66	1.9420	17 33 36.9	11.110
23	2 4 55.28	1.9453	17 44 41.2	11.034
24	2 6 52.10	1.9486	N. 17 55 41.0	10.958

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 15.			
	h m s	s	° ′ ″	″
0	2 6 52.10	1.9486	N. 17 55 41.0	10.958
1	2 8 49.11	1.9519	18 6 36.1	10.880
2	2 10 46.33	1.9553	18 17 26.6	10.802
3	2 12 43.75	1.9587	18 28 12.3	10.723
4	2 14 41.37	1.9621	18 38 53.3	10.643
5	2 16 39.20	1.9656	18 49 29.4	10.562
6	2 18 37.24	1.9691	19 0 0.7	10.481
7	2 20 35.49	1.9726	19 10 27.1	10.398
8	2 22 33.95	1.9761	19 20 48.4	10.314
9	2 24 32.62	1.9796	19 31 4.8	10.231
10	2 26 31.50	1.9831	19 41 16.1	10.146
11	2 28 30.59	1.9867	19 51 22.3	10.060
12	2 30 29.90	1.9903	20 1 23.3	9.973
13	2 32 29.43	1.9939	20 11 19.1	9.886
14	2 34 29.17	1.9975	20 21 9.6	9.798
15	2 36 29.13	2.0012	20 30 54.9	9.710
16	2 38 29.31	2.0048	20 40 34.8	9.620
17	2 40 29.71	2.0085	20 50 9.3	9.529
18	2 42 30.33	2.0122	20 59 38.3	9.438
19	2 44 31.17	2.0158	21 9 1.8	9.346
20	2 46 32.23	2.0196	21 18 19.8	9.253
21	2 48 33.52	2.0233	21 27 32.2	9.159
22	2 50 35.03	2.0270	21 36 38.9	9.065
23	2 52 36.76	2.0307	N. 21 45 40.0	8.970
	FRIDAY 16.			
0	2 54 38.71	2.0344	N. 21 54 35.3	8.873
1	2 56 40.89	2.0382	22 3 24.8	8.777
2	2 58 43.29	2.0418	22 12 8.5	8.680
3	3 0 45.91	2.0456	22 20 46.4	8.582
4	3 2 48.76	2.0493	22 29 18.3	8.483
5	3 4 51.83	2.0530	22 37 44.3	8.383
6	3 6 55.12	2.0568	22 46 4.2	8.282
7	3 8 58.64	2.0605	22 54 18.1	8.180
8	3 11 2.38	2.0642	23 2 25.8	8.078
9	3 13 6.34	2.0678	23 10 27.4	7.976
10	3 15 10.52	2.0716	23 18 22.9	7.873
11	3 17 14.93	2.0753	23 26 12.1	7.768
12	3 19 19.56	2.0790	23 33 55.0	7.663
13	3 21 24.41	2.0826	23 41 31.6	7.557
14	3 23 29.47	2.0863	23 49 1.8	7.450
15	3 25 34.76	2.0899	23 56 25.6	7.343
16	3 27 40.26	2.0935	24 3 43.0	7.236
17	3 29 45.98	2.0971	24 10 53.9	7.127
18	3 31 51.91	2.1007	24 17 58.2	7.017
19	3 33 58.06	2.1043	24 24 55.9	6.907
20	3 36 4.42	2.1078	24 31 47.0	6.797
21	3 38 10.99	2.1113	24 38 31.5	6.686
22	3 40 17.77	2.1148	24 45 9.3	6.573
23	3 42 24.76	2.1183	24 51 40.3	6.460
24	3 44 31.96	2.1218	N. 24 58 4.5	6.347

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 17.					MONDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	3 44 31.96	2.1218	N. 24 58 4.5	6.347	0	5 29 32.78	2.2329	N. 27 41 26.5	0.293
1	3 46 39.37	2.1252	25 4 21.9	6.233	1	5 31 46.78	2.2338	27 41 40.0	0.158
2	3 48 46.98	2.1285	25 10 32.4	6.118	2	5 34 0.83	2.2346	27 41 45.5	+0.023
3	3 50 54.79	2.1318	25 16 36.0	6.003	3	5 36 14.93	2.2353	27 41 42.9	−0.111
4	3 53 2.80	2.1352	25 22 32.7	5.887	4	5 38 29.07	2.2359	27 41 32.2	0.247
5	3 55 11.01	2.1385	25 28 22.4	5.770	5	5 40 43.24	2.2364	27 41 13.3	0.382
6	3 57 19.42	2.1418	25 34 5.1	5.653	6	5 42 57.44	2.2369	27 40 46.4	0.516
7	3 59 28.02	2.1449	25 39 40.7	5.535	7	5 45 11.67	2.2373	27 40 11.4	0.651
8	4 1 36.81	2.1481	25 45 9.3	5.417	8	5 47 25.92	2.2377	27 39 28.3	0.787
9	4 3 45.79	2.1513	25 50 30.7	5.298	9	5 49 40.19	2.2379	27 38 37.0	0.923
10	4 5 54.96	2.1543	25 55 45.0	5.178	10	5 51 54.47	2.2381	27 37 37.6	1.058
11	4 8 4.31	2.1574	26 0 52.1	5.058	11	5 54 8.76	2.2383	27 36 30.1	1.193
12	4 10 13.85	2.1605	26 5 51.9	4.937	12	5 56 23.06	2.2383	27 35 14.5	1.328
13	4 12 23.57	2.1634	26 10 44.5	4.815	13	5 58 37.36	2.2383	27 33 50.8	1.463
14	4 14 33.46	2.1663	26 15 29.7	4.693	14	6 0 51.66	2.2383	27 32 18.9	1.599
15	4 16 43.53	2.1693	26 20 7.6	4.571	15	6 3 5.95	2.2381	27 30 38.9	1.734
16	4 18 53.77	2.1721	26 24 38.2	4.448	16	6 5 20.23	2.2379	27 28 50.8	1.869
17	4 21 4.18	2.1749	26 29 1.4	4.324	17	6 7 34.50	2.2377	27 26 54.6	2.004
18	4 23 14.76	2.1777	26 33 17.1	4.200	18	6 9 48.75	2.2373	27 24 50.3	2.139
19	4 25 25.50	2.1804	26 37 25.4	4.076	19	6 12 2.98	2.2369	27 22 37.9	2.275
20	4 27 36.41	2.1831	26 41 26.2	3.951	20	6 14 17.18	2.2364	27 20 17.3	2.410
21	4 29 47.47	2.1856	26 45 19.5	3.825	21	6 16 31.35	2.2359	27 17 48.7	2.544
22	4 31 58.68	2.1882	26 49 5.2	3.698	22	6 18 45.49	2.2353	27 15 12.0	2.679
23	4 34 10.05	2.1907	N. 26 52 43.3	3.573	23	6 20 59.59	2.2347	N. 27 12 27.2	2.814
	SUNDAY 18.					TUESDAY 20.			
0	4 36 21.56	2.1930	N. 26 56 13.9	3.446	0	6 23 13.65	2.2340	N. 27 9 34.3	2.948
1	4 38 33.21	2.1954	26 59 36.8	3.319	1	6 25 27.67	2.2333	27 6 33.4	3.083
2	4 40 45.01	2.1978	27 2 52.1	3.191	2	6 27 41.64	2.2323	27 3 24.4	3.218
3	4 42 56.94	2.2000	27 5 59.7	3.063	3	6 29 55.55	2.2314	27 0 7.3	3.352
4	4 45 9.01	2.2023	27 8 59.6	2.933	4	6 32 9.41	2.2305	26 56 42.2	3.485
5	4 47 21.21	2.2044	27 11 51.7	2.804	5	6 34 23.21	2.2295	26 53 9.1	3.618
6	4 49 33.54	2.2065	27 14 36.1	2.675	6	6 36 36.95	2.2284	26 49 28.0	3.752
7	4 51 45.99	2.2085	27 17 12.7	2.545	7	6 38 50.62	2.2273	26 45 38.9	3.885
8	4 53 58.56	2.2104	27 19 41.5	2.415	8	6 41 4.22	2.2261	26 41 41.8	4.018
9	4 56 11.24	2.2123	27 22 2.5	2.284	9	6 43 17.75	2.2248	26 37 36.7	4.151
10	4 58 24.04	2.2142	27 24 15.6	2.153	10	6 45 31.20	2.2236	26 33 23.7	4.283
11	5 0 36.94	2.2159	27 26 20.9	2.023	11	6 47 44.58	2.2223	26 29 2.7	4.416
12	5 2 49.95	2.2177	27 28 18.3	1.891	12	6 49 57.87	2.2208	26 24 33.8	4.548
13	5 5 3.06	2.2193	27 30 7.8	1.759	13	6 52 11.08	2.2194	26 19 57.0	4.679
14	5 7 16.27	2.2209	27 31 49.4	1.628	14	6 54 24.20	2.2179	26 15 12.3	4.811
15	5 9 29.57	2.2224	27 33 23.1	1.495	15	6 56 37.23	2.2163	26 10 19.7	4.942
16	5 11 42.96	2.2238	27 34 48.8	1.362	16	6 58 50.16	2.2148	26 5 19.3	5.073
17	5 13 56.43	2.2252	27 36 6.5	1.229	17	7 1 3.00	2.2132	26 0 11.0	5.203
18	5 16 9.98	2.2265	27 37 16.3	1.097	18	7 3 15.74	2.2114	25 54 54.9	5.333
19	5 18 23.61	2.2278	27 38 18.1	0.963	19	7 5 28.37	2.2097	25 49 31.0	5.463
20	5 20 37.32	2.2290	27 39 11.8	0.829	20	7 7 40.90	2.2080	25 43 59.4	5.592
21	5 22 51.09	2.2301	27 39 57.6	0.696	21	7 9 53.33	2.2063	25 38 20.0	5.721
22	5 25 4.93	2.2312	27 40 35.3	0.561	22	7 12 5.65	2.2043	25 32 32.9	5.850
23	5 27 18.83	2.2321	27 41 4.9	0.427	23	7 14 17.85	2.2024	25 26 38.0	5.978
24	5 29 32.78	2.2329	N. 27 41 26.5	0.293	24	7 16 29.94	2.2005	N. 25 20 35.5	6.105

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 21.

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.				Diff. for 1 Min.
	h	m	s	s		°	′	″	″
0	7	16	29.94	2.2005	N.	25	20	35.5	6.105
1	7	18	41.91	2.1986		25	14	25.4	6.233
2	7	20	53.77	2.1967		25	8	7.6	6.360
3	7	23	5.51	2.1947		25	1	42.2	6.487
4	7	25	17.13	2.1926		24	55	9.2	6.613
5	7	27	28.62	2.1905		24	48	28.7	6.738
6	7	29	39.99	2.1884		24	41	40.6	6.864
7	7	31	51.23	2.1863		24	34	45.0	6.988
8	7	34	2.34	2.1841		24	27	42.0	7.113
9	7	36	13.32	2.1819		24	20	31.5	7.237
10	7	38	24.17	2.1798		24	13	13.6	7.360
11	7	40	34.89	2.1775		24	5	48.3	7.483
12	7	42	45.47	2.1753		23	58	15.6	7.606
13	7	44	55.92	2.1730		23	50	35.6	7.728
14	7	47	6.23	2.1707		23	42	48.3	7.848
15	7	49	16.40	2.1684		23	34	53.8	7.969
16	7	51	26.44	2.1662		23	26	52.0	8.090
17	7	53	36.34	2.1638		23	18	43.0	8.209
18	7	55	46.10	2.1615		23	10	26.9	8.328
19	7	57	55.72	2.1592		23	2	3.6	8.448
20	8	0	5.20	2.1568		22	53	33.2	8.565
21	8	2	14.54	2.1545		22	44	55.8	8.683
22	8	4	23.74	2.1521		22	36	11.3	8.800
23	8	6	32.79	2.1497	N.	22	27	19.8	8.917

THURSDAY 22.

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.				Diff. for 1 Min.
0	8	8	41.70	2.1473	N.	22	18	21.3	9.033
1	8	10	50.47	2.1450		22	9	15.9	9.148
2	8	12	59.10	2.1427		22	0	3.6	9.262
3	8	15	7.59	2.1403		21	50	44.5	9.376
4	8	17	15.94	2.1380		21	41	18.5	9.489
5	8	19	24.15	2.1356		21	31	45.8	9.602
6	8	21	32.21	2.1333		21	22	6.3	9.714
7	8	23	40.14	2.1309		21	12	20.1	9.826
8	8	25	47.92	2.1286		21	2	27.2	9.938
9	8	27	55.57	2.1263		20	52	27.6	10.048
10	8	30	3.08	2.1240		20	42	21.5	10.157
11	8	32	10.45	2.1217		20	32	8.8	10.266
12	8	34	17.68	2.1194		20	21	49.6	10.374
13	8	36	24.78	2.1172		20	11	23.9	10.482
14	8	38	31.74	2.1149		20	0	51.8	10.588
15	8	40	38.57	2.1127		19	50	13.3	10.695
16	8	42	45.26	2.1104		19	39	28.4	10.801
17	8	44	51.82	2.1083		19	28	37.2	10.906
18	8	46	58.25	2.1061		19	17	39.7	11.010
19	8	49	4.55	2.1040		19	6	36.0	11.113
20	8	51	10.73	2.1019		18	55	26.1	11.217
21	8	53	16.78	2.0998		18	44	10.0	11.319
22	8	55	22.70	2.0977		18	32	47.8	11.420
23	8	57	28.50	2.0957		18	21	19.6	11.521
24	8	59	34.18	2.0937	N.	18	9	45.3	11.621

FRIDAY 23.

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.				Diff. for 1 Min.
	h	m	s	s		°	′	″	″
0	8	59	34.18	2.0937	N.	18	9	45.3	11.621
1	9	1	39.74	2.0917		17	58	5.1	11.720
2	9	3	45.18	2.0898		17	46	18.9	11.819
3	9	5	50.51	2.0879		17	34	26.8	11.917
4	9	7	55.73	2.0860		17	22	28.9	12.013
5	9	10	0.83	2.0841		17	10	25.2	12.110
6	9	12	5.82	2.0823		16	58	15.7	12.206
7	9	14	10.71	2.0807		16	46	0.5	12.300
8	9	16	15.50	2.0789		16	33	39.7	12.394
9	9	18	20.18	2.0772		16	21	13.2	12.488
10	9	20	24.76	2.0756		16	8	41.2	12.580
11	9	22	29.25	2.0740		15	56	3.6	12.672
12	9	24	33.64	2.0724		15	43	20.6	12.763
13	9	26	37.94	2.0709		15	30	32.1	12.853
14	9	28	42.15	2.0695		15	17	38.3	12.942
15	9	30	46.28	2.0681		15	4	39.1	13.030
16	9	32	50.32	2.0667		14	51	34.7	13.118
17	9	34	54.28	2.0654		14	38	25.0	13.204
18	9	36	58.17	2.0642		14	25	10.2	13.290
19	9	39	1.98	2.0629		14	11	50.2	13.376
20	9	41	5.72	2.0618		13	58	25.1	13.460
21	9	43	9.39	2.0607		13	44	55.0	13.543
22	9	45	13.00	2.0596		13	31	19.9	13.626
23	9	47	16.54	2.0585	N.	13	17	39.9	13.708

SATURDAY 24.

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.				Diff. for 1 Min.
0	9	49	20.02	2.0576	N.	13	3	55.0	13.788
1	9	51	23.45	2.0568		12	50	5.3	13.868
2	9	53	26.83	2.0559		12	36	10.8	13.948
3	9	55	30.16	2.0552		12	22	11.6	14.025
4	9	57	33.45	2.0544		12	8	7.8	14.102
5	9	59	36.69	2.0538		11	53	59.4	14.178
6	10	1	39.90	2.0532		11	39	46.4	14.254
7	10	3	43.07	2.0526		11	25	28.9	14.329
8	10	5	46.21	2.0522		11	11	6.9	14.403
9	10	7	49.33	2.0518		10	56	40.6	14.474
10	10	9	52.42	2.0514		10	42	10.0	14.546
11	10	11	55.50	2.0512		10	27	35.1	14.617
12	10	13	58.56	2.0509		10	12	56.0	14.687
13	10	16	1.61	2.0508		9	58	12.7	14.755
14	10	18	4.65	2.0507		9	43	25.4	14.823
15	10	20	7.69	2.0508		9	28	34.0	14.889
16	10	22	10.74	2.0508		9	13	38.7	14.954
17	10	24	13.79	2.0508		8	58	39.5	15.019
18	10	26	16.84	2.0510		8	43	36.4	15.083
19	10	28	19.91	2.0513		8	28	29.5	15.147
20	10	30	23.00	2.0517		8	13	18.8	15.208
21	10	32	26.11	2.0521		7	58	4.5	15.268
22	10	34	29.25	2.0526		7	42	46.7	15.327
23	10	36	32.42	2.0531		7	27	25.3	15.386
24	10	38	35.62	2.0537	N.	7	12	0.4	15.443

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 25.			
	h m s	s	° ′ ″	″
0	10 38 35.62	2.0537	N. 7 12 0.4	15.443
1	10 40 38.86	2.0544	6 56 32.2	15.498
2	10 42 42.15	2.0553	6 41 0.6	15.553
3	10 44 45.49	2.0561	6 25 25.8	15.608
4	10 46 48.88	2.0570	6 9 47.7	15.661
5	10 48 52.33	2.0580	5 54 6.5	15.712
6	10 50 55.84	2.0590	5 38 22.3	15.762
7	10 52 59.42	2.0603	5 22 35.1	15.811
8	10 55 3.08	2.0616	5 6 45.0	15.858
9	10 57 6.81	2.0628	4 50 52.1	15.905
10	10 59 10.62	2.0642	4 34 56.4	15.952
11	11 1 14.51	2.0657	4 18 57.9	15.996
12	11 3 18.50	2.0673	4 2 56.9	16.038
13	11 5 22.59	2.0690	3 46 53.3	16.080
14	11 7 26.78	2.0707	3 30 47.3	16.120
15	11 9 31.07	2.0724	3 14 38.9	16.160
16	11 11 35.47	2.0743	2 58 28.1	16.198
17	11 13 39.99	2.0763	2 42 15.1	16.234
18	11 15 44.63	2.0784	2 26 0.0	16.269
19	11 17 49.40	2.0806	2 9 42.8	16.303
20	11 19 54.30	2.0828	1 53 23.6	16.336
21	11 21 59.33	2.0850	1 37 2.5	16.368
22	11 24 4.50	2.0874	1 20 39.5	16.398
23	11 26 9.82	2.0899	N. 1 4 14.8	16.426
	MONDAY 26.			
0	11 28 15.29	2.0925	N. 0 47 48.4	16.453
1	11 30 20.92	2.0952	0 31 20.4	16.478
2	11 32 26.71	2.0978	N. 0 14 51.0	16.502
3	11 34 32.66	2.1007	S. 0 1 39.8	16.525
4	11 36 38.79	2.1036	0 18 12.0	16.547
5	11 38 45.09	2.1066	0 34 45.4	16.566
6	11 40 51.58	2.1097	0 51 19.9	16.584
7	11 42 58.25	2.1128	1 7 55.5	16.601
8	11 45 5.12	2.1161	1 24 32.0	16.616
9	11 47 12.18	2.1194	1 41 9.4	16.630
10	11 49 19.45	2.1228	1 57 47.6	16.642
11	11 51 26.92	2.1263	2 14 26.4	16.652
12	11 53 34.61	2.1300	2 31 5.8	16.661
13	11 55 42.52	2.1337	2 47 45.7	16.668
14	11 57 50.65	2.1374	3 4 26.0	16.673
15	11 59 59.01	2.1413	3 21 6.5	16.677
16	12 2 7.61	2.1453	3 37 47.2	16.679
17	12 4 16.45	2.1493	3 54 28.0	16.680
18	12 6 25.53	2.1534	4 11 8.8	16.679
19	12 8 34.86	2.1576	4 27 49.5	16.676
20	12 10 44.44	2.1619	4 44 29.9	16.671
21	12 12 54.29	2.1663	5 1 10.0	16.665
22	12 15 4.40	2.1708	5 17 49.7	16.657
23	12 17 14.78	2.1753	5 34 28.8	16.647
24	12 19 25.44	2.1800	S. 5 51 7.3	16.635

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 27.			
	h m s	s	° ′ ″	″
0	12 19 25.44	2.1800	S. 5 51 7.3	16.635
1	12 21 36.38	2.1848	6 7 45.0	16.621
2	12 23 47.61	2.1895	6 24 21.8	16.606
3	12 25 59.12	2.1943	6 40 57.7	16.589
4	12 28 10.93	2.1993	6 57 32.5	16.569
5	12 30 23.04	2.2044	7 14 6.0	16.548
6	12 32 35.46	2.2097	7 30 38.2	16.525
7	12 34 48.20	2.2149	7 47 9.0	16.500
8	12 37 1.25	2.2202	8 3 38.2	16.473
9	12 39 14.62	2.2255	8 20 5.8	16.445
10	12 41 28.31	2.2310	8 36 31.6	16.413
11	12 43 42.34	2.2366	8 52 55.4	16.380
12	12 45 56.70	2.2422	9 9 17.2	16.346
13	12 48 11.40	2.2479	9 25 36.9	16.309
14	12 50 26.45	2.2538	9 41 54.3	16.271
15	12 52 41.85	2.2596	9 58 9.4	16.230
16	12 54 57.60	2.2655	10 14 21.9	16.186
17	12 57 13.71	2.2715	10 30 31.7	16.141
18	12 59 30.18	2.2776	10 46 38.8	16.094
19	13 1 47.02	2.2838	11 2 43.0	16.045
20	13 4 4.23	2.2899	11 18 44.2	15.993
21	13 6 21.81	2.2963	11 34 42.2	15.939
22	13 8 39.78	2.3027	11 50 36.9	15.883
23	13 10 58.13	2.3090	S. 12 6 28.2	15.826
	WEDNESDAY 28.			
0	13 13 16.86	2.3155	S. 12 22 16.0	15.767
1	13 15 35.99	2.3221	12 38 0.2	15.704
2	13 17 55.51	2.3288	12 53 40.5	15.639
3	13 20 15.44	2.3355	13 9 16.9	15.573
4	13 22 35.77	2.3422	13 24 49.2	15.503
5	13 24 56.50	2.3489	13 40 17.3	15.433
6	13 27 17.64	2.3558	13 55 41.1	15.359
7	13 29 39.20	2.3628	14 11 0.4	15.283
8	13 32 1.17	2.3697	14 26 15.1	15.205
9	13 34 23.56	2.3767	14 41 25.0	15.125
10	13 36 46.37	2.3837	14 56 30.1	15.043
11	13 39 9.60	2.3908	15 11 30.1	14.958
12	13 41 33.26	2.3979	15 26 25.0	14.871
13	13 43 57.35	2.4051	15 41 14.6	14.782
14	13 46 21.87	2.4123	15 55 58.8	14.690
15	13 48 46.83	2.4196	16 10 37.4	14.596
16	13 51 12.22	2.4268	16 25 10.3	14.500
17	13 53 38.05	2.4342	16 39 37.4	14.402
18	13 56 4.32	2.4415	16 53 58.5	14.300
19	13 58 31.03	2.4488	17 8 13.4	14.196
20	14 0 58.18	2.4562	17 22 22.0	14.091
21	14 3 25.77	2.4636	17 36 24.3	13.983
22	14 5 53.81	2.4710	17 50 20.0	13.873
23	14 8 22.29	2.4784	18 4 9.0	13.760
24	14 10 51.22	2.4858	S. 18 17 51.2	13.646

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 29.			
	h m s	s	° ′ ″	″
0	14 10 51.22	2.4858	S. 18 17 51.2	13.646
1	14 13 20.59	2.4933	18 31 26.5	13.529
2	14 15 50.41	2.5008	18 44 54.6	13.408
3	14 18 20.68	2.5082	18 58 15.5	13.287
4	14 20 51.39	2.5155	19 11 29.0	13.163
5	14 23 22.54	2.5229	19 24 35.0	13.036
6	14 25 54.14	2.5304	19 37 33.3	12.908
7	14 28 26.19	2.5378	19 50 23.9	12.777
8	14 30 58.68	2.5452	20 3 6.5	12.643
9	14 33 31.61	2.5524	20 15 41.1	12.508
10	14 36 4.97	2.5598	20 28 7.4	12.369
11	14 38 38.78	2.5671	20 40 25.4	12.230
12	14 41 13.02	2.5743	20 52 35.0	12.088
13	14 43 47.70	2.5815	21 4 36.0	11.943
14	14 46 22.80	2.5887	21 16 28.2	11.797
15	14 48 58.34	2.5958	21 28 11.6	11.648
16	14 51 34.30	2.6028	21 39 46.0	11.497
17	14 54 10.68	2.6098	21 51 11.2	11.343
18	14 56 47.48	2.6168	22 2 27.2	11.188
19	14 59 24.70	2.6238	22 13 33.8	11.031
20	15 2 2.33	2.6305	22 24 30.9	10.872
21	15 4 40.36	2.6372	22 35 18.4	10.711
22	15 7 18.79	2.6438	22 45 56.2	10.548
23	15 9 57.62	2.6504	S. 22 56 24.1	10.382
	FRIDAY 30.			
0	15 12 36.84	2.6569	S. 23 6 42.0	10.214
1	15 15 16.45	2.6633	23 16 49.8	10.045
2	15 17 56.44	2.6696	23 26 47.4	9.873
3	15 20 36.80	2.6758	23 36 34.6	9.700
4	15 23 17.53	2.6818	23 46 11.4	9.526
5	15 25 58.62	2.6878	23 55 37.7	9.348
6	15 28 40.07	2.6937	24 4 53.2	9.169
7	15 31 21.86	2.6994	24 13 58.0	8.990
8	15 34 4.00	2.7051	24 22 52.0	8.808
9	15 36 46.47	2.7105	24 31 34.9	8.623
10	15 39 29.26	2.7158	24 40 6.8	8.438
11	15 42 12.37	2.7211	24 48 27.5	8.252
12	15 44 55.79	2.7262	24 56 37.0	8.063
13	15 47 39.51	2.7311	25 4 35.1	7.873
14	15 50 23.52	2.7358	25 12 21.7	7.681
15	15 53 7.81	2.7405	25 19 56.8	7.488
16	15 55 52.38	2.7450	25 27 20.3	7.294
17	15 58 37.21	2.7493	25 34 32.1	7.099
18	16 1 22.29	2.7534	25 41 32.2	6.903
19	16 4 7.62	2.7574	25 48 20.4	6.704
20	16 6 53.18	2.7612	25 54 56.7	6.505
21	16 9 38.96	2.7648	26 1 21.0	6.305
22	16 12 24.96	2.7683	26 7 33.3	6.103
23	16 15 11.16	2.7715	26 13 33.4	5.901
24	16 17 57.54	2.7746	S. 26 19 21.4	5.698

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY, MAY 1.			
	h m s	s	° ′ ″	″
0	16 17 57.54	2.7746	S. 26 19 21.4	5.698

PHASES OF THE MOON.

			d	h	m
☾	Last Quarter	Apr.	6	8	12.4
●	New Moon		13	23	35.7
☽	First Quarter		22	3	39.1
○	Full Moon		29	2	19.3

			d	h
☾	Perigee	Apr.	1	11.6
☾	Apogee		17	3.6
☾	Perigee		29	19.2

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Sat.	1	2 30 28.34	9.522	N.14 49 53.9	+45.86	15 54.12	65.97	2 51.04	0.333
SUN.	2	2 34 17.14	9.545	15 8 7.3	45.25	15 53.87	66.05	2 58.78	0.311
Mon.	3	2 38 6.50	9.568	15 26 5.8	44.62	15 53.63	66.13	3 5.96	0.288
Tues.	4	2 41 56.42	9.592	15 43 49.3	+43.98	15 53.39	66.21	3 12.58	0.264
Wed.	5	2 45 46.90	9.616	16 1 17.2	43.33	15 53.15	66.29	3 18.64	0.240
Thur.	6	2 49 37.97	9.640	16 18 29.2	42.67	15 52.91	66.37	3 24.11	0.216
Fri.	7	2 53 29.62	9.664	16 35 25.2	+41.99	15 52.68	66.45	3 29.00	0.192
Sat.	8	2 57 21.85	9.689	16 52 4.7	41.30	15 52.46	66.53	3 33.32	0.167
SUN.	9	3 1 14.67	9.713	17 8 27.5	40.59	15 52.24	66.61	3 37.04	0.143
Mon.	10	3 5 8.08	9.738	17 24 33.1	+39.87	15 52.02	66.70	3 40.18	0.118
Tues.	11	3 9 2.08	9.762	17 40 21.3	39.14	15 51.80	66.78	3 42.73	0.094
Wed.	12	3 12 56.66	9.786	17 55 51.8	38.40	15 51.58	66.86	3 44.70	0.070
Thur.	13	3 16 51.82	9.810	18 11 4.3	+37.64	15 51.37	66.94	3 46.09	0.046
Fri.	14	3 20 47.56	9.834	18 25 58.4	36.87	15 51.16	67.02	3 46.90	0.022
Sat.	15	3 24 43.88	9.858	18 40 33.9	36.09	15 50.95	67.10	3 47.15	0.001
SUN.	16	3 28 40.76	9.882	18 54 50.5	+35.29	15 50.75	67.18	3 46.82	0.025
Mon.	17	3 32 38.21	9.905	19 8 47.9	34.48	15 50.56	67.27	3 45.93	0.049
Tues.	18	3 36 36.22	9.928	19 22 25.8	33.67	15 50.37	67.35	3 44.48	0.072
Wed.	19	3 40 34.77	9.951	19 35 43.9	+32.84	15 50.19	67.43	3 42.49	0.094
Thur.	20	3 44 33.86	9.973	19 48 42.0	32.00	15 50.01	67.51	3 39.96	0.116
Fri.	21	3 48 33.49	9.995	20 1 19.8	31.15	15 49.83	67.59	3 36.90	0.138
Sat.	22	3 52 33.64	10.017	20 13 37.0	+30.29	15 49.66	67.66	3 33.32	0.160
SUN.	23	3 56 34.30	10.038	20 25 33.5	29.42	15 49.49	67.74	3 29.22	0.181
Mon.	24	4 0 35.48	10.059	20 37 9.0	28.54	15 49.32	67.81	3 24.62	0.202
Tues.	25	4 4 37.14	10.080	20 48 23.2	+27.65	15 49.15	67.89	3 19.53	0.223
Wed.	26	4 8 39.30	10.100	20 59 16.0	26.75	15 48.99	67.96	3 13.94	0.243
Thur.	27	4 12 41.94	10.120	21 9 47.2	25.84	15 48.83	68.03	3 7.87	0.263
Fri.	28	4 16 45.06	10.140	21 19 56.4	+24.92	15 48.67	68.10	3 1.33	0.282
Sat.	29	4 20 48.65	10.159	21 29 43.6	24.00	15 48.52	68.16	2 54.32	0.302
SUN.	30	4 24 52.70	10.178	21 39 8.6	23.07	15 48.37	68.22	2 46.85	0.321
Mon.	31	4 28 57.20	10.197	21 48 11.1	22.13	15 48.22	68.28	2 38.93	0.339
Tues.	32	4 33 2.15	10.215	N.21 56 51.0	+21.18	15 48.07	68.33	2 30.56	0.357

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0ˢ.18 from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Sat.	1	2 30 28.80	9.523	N. 14 49 56.1	+45.87	2 51.06	0.333	2 33 19.86
SUN.	2	2 34 17.62	9.546	15 8 9.6	45.26	2 58.80	0.311	2 37 16.42
Mon.	3	2 38 6.99	9.569	15 26 8.2	44.63	3 5.98	0.288	2 41 12.97
Tues.	4	2 41 56.93	9.592	15 43 51.6	+43.99	3 12.60	0.264	2 45 9.53
Wed.	5	2 45 47.43	9.616	16 1 19.6	43.33	3 18.65	0.240	2 49 6.08
Thur.	6	2 49 38.51	9.640	16 18 31.7	42.66	3 24.12	0.216	2 53 2.64
Fri.	7	2 53 30.18	9.665	16 35 27.6	+41.99	3 29.02	0.192	2 56 59.19
Sat.	8	2 57 22.42	9.689	16 52 7.2	41.30	3 33.32	0.167	3 0 55.75
SUN.	9	3 1 15.26	9.714	17 8 29.9	40.59	3 37.05	0.143	3 4 52.31
Mon.	10	3 5 8.68	9.738	17 24 35.6	+39.87	3 40.18	0.118	3 8 48.86
Tues.	11	3 9 2.68	9.762	17 40 23.7	39.14	3 42.74	0.094	3 12 45.42
Wed.	12	3 12 57.27	9.787	17 55 54.2	38.40	3 44.71	0.070	3 16 41.98
Thur.	13	3 16 52.44	9.811	18 11 6.7	+37.64	3 46.10	0.046	3 20 38.53
Fri.	14	3 20 48.18	9.835	18 26 0.8	36.87	3 46.91	0.022	3 24 35.09
Sat.	15	3 24 44.50	9.858	18 40 36.2	36.08	3 47.14	0.001	3 28 31.65
SUN.	16	3 28 41.39	9.882	18 54 52.8	+35.28	3 46.82	0.025	3 32 28.20
Mon.	17	3 32 38.84	9.905	19 8 50.1	34.47	3 45.92	0.049	3 36 24.76
Tues.	18	3 36 36.84	9.928	19 22 27.9	33.65	3 44.48	0.072	3 40 21.32
Wed.	19	3 40 35.39	9.951	19 35 45.9	+32.83	3 42.49	0.094	3 44 17.87
Thur.	20	3 44 34.47	9.973	19 48 43.9	31.99	3 39.96	0.116	3 48 14.43
Fri.	21	3 48 34.10	9.995	20 1 21.7	31.14	3 36.89	0.138	3 52 10.99
Sat.	22	3 52 34.23	10.016	20 13 38.8	+30.28	3 33.31	0.160	3 56 7.54
SUN.	23	3 56 34.89	10.038	20 25 35.2	29.41	3 29.21	0.181	4 0 4.10
Mon.	24	4 0 36.05	10.059	20 37 10.6	28.53	3 24.61	0.202	4 4 0.66
Tues.	25	4 4 37.70	10.079	20 48 24.7	+27.64	3 19.52	0.223	4 7 57.22
Wed.	26	4 8 39.84	10.099	20 59 17.5	26.74	3 13.93	0.243	4 11 53.78
Thur.	27	4 12 42.47	10.119	21 9 48.5	25.84	3 7.86	0.263	4 15 50.33
Fri.	28	4 16 45.57	10.139	21 19 57.7	+24.93	3 1.32	0.282	4 19 46.89
Sat.	29	4 20 49.14	10.158	21 29 44.8	24.01	2 54.31	0.302	4 23 43.45
SUN.	30	4 24 53.17	10.177	21 39 9.7	23.07	2 46.84	0.321	4 27 40.01
Mon.	31	4 28 57.65	10.196	21 48 12.1	22.13	2 38.91	0.339	4 31 36.56
Tues.	32	4 33 2.58	10.214	N. 21 56 51.9	+21.18	2 30.54	0.357	4 35 33.12

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

Diff. for 1 Hour,
+9ˢ.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S True Longitude. λ			λ′		Diff. for 1 Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.		
		°	′	″	′	″	″	″			h	m	s
1	121	40	2	15.8	1	50.1	145.50	−0.38	0.003 3479	+46.1	21	23	9.35
2	122	41	0	27.1	0	1.3	145.44	0.34	0.003 4584	45.9	21	19	13.44
3	123	41	58	36.8	58	10.9	145.38	0.27	0.003 5682	45.6	21	15	17.53
4	124	42	56	45.1	56	19.0	145.32	−0.17	0.003 6774	+45.3	21	11	21.62
5	125	43	54	52.0	54	25.8	145.26	−0.05	0.003 7858	44.9	21	7	25.71
6	126	44	52	57.4	52	31.1	145.20	+0.08	0.003 8930	44.4	21	3	29.80
7	127	45	51	1.6	50	35.1	145.14	+0.20	0.003 9990	+43.9	20	59	33.89
8	128	46	49	4.4	48	37.7	145.09	0.33	0.004 1037	43.3	20	55	37.98
9	129	47	47	5.7	46	38.9	145.03	0.45	0.004 2069	42.6	20	51	42.07
10	130	48	45	5.7	44	38.7	144.97	+0.54	0.004 3084	+41.9	20	47	46.16
11	131	49	43	4.3	42	37.1	144.91	0.62	0.004 4083	41.2	20	43	50.25
12	132	50	41	1.4	40	34.0	144.85	0.68	0.004 5063	40.5	20	39	54.34
13	133	51	38	57.0	38	29.6	144.79	+0.72	0.004 6025	+39.7	20	35	58.43
14	134	52	36	51.2	36	23.6	144.72	0.72	0.004 6969	38.9	20	32	2.52
15	135	53	34	43.8	34	16.0	144.66	0.70	0.004 7892	38.1	20	28	6.61
16	136	54	32	35.0	32	7.0	144.59	+0.66	0.004 8797	+37.3	20	24	10.70
17	137	55	30	24.6	29	56.4	144.53	0.60	0.004 9683	36.5	20	20	14.79
18	138	56	28	12.6	27	44.3	144.47	0.51	0.005 0550	35.7	20	16	18.88
19	139	57	25	59.0	25	30.5	144.40	+0.39	0.005 1398	+34.9	20	12	22.96
20	140	58	23	43.8	23	15.2	144.33	0.27	0.005 2227	34.2	20	8	27.05
21	141	59	21	27.0	20	58.2	144.27	0.14	0.005 3040	33.5	20	4	31.14
22	142	60	19	8.5	18	39.6	144.20	+0.01	0.005 3836	+32.8	20	0	35.23
23	143	61	16	48.5	16	19.4	144.13	−0.11	0.005 4616	32.2	19	56	39.32
24	144	62	14	26.9	13	57.6	144.07	0.23	0.005 5383	31.7	19	52	43.41
25	145	63	12	3.8	11	34.3	144.01	−0.31	0.005 6136	+31.2	19	48	47.50
26	146	64	9	39.2	9	9.6	143.95	0.36	0.005 6878	30.7	19	44	51.58
27	147	65	7	13.3	6	43.5	143.89	0.38	0.005 7608	30.2	19	40	55.67
28	148	66	4	46.1	4	16.1	143.84	−0.37	0.005 8328	+29.8	19	36	59.76
29	149	67	2	17.7	1	47.5	143.79	0.33	0.005 9038	29.4	19	33	3.85
30	150	67	59	48.2	59	17.9	143.75	0.27	0.005 9738	28.9	19	29	7.94
31	151	68	57	17.8	56	47.3	143.72	0.17	0.006 0427	28.4	19	25	12.02
32	152	69	54	46.5	54	15.8	143.68	−0.05	0.006 1103	+27.9	19	21	16.11

NOTE.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour, $-9^{s}.8296$. (Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 39.9	16 36.3	61 3.74	−0.933	60 50.50	−1.266	14 22.4	2.75	17.0
2	16 31.6	16 26.2	60 33.53	1.554	60 13.41	1.789	15 27.9	2.68	18.0
3	16 20.0	16 13.4	59 50.79	1.969	59 26.35	2.094	16 30.2	2.50	19.0
4	16 6.4	15 59.2	59 0.73	−2.167	58 34.53	−2.192	17 27.4	2.27	20.0
5	15 52.1	15 45.0	58 8.27	2.178	57 42.41	2.127	18 19.1	2.05	21.0
6	15 38.2	15 31.6	57 17.33	2.049	56 53.33	1.948	19 6.2	1.88	22.0
7	15 25.5	15 19.7	56 30.64	−1.831	56 9.42	−1.704	19 49.8	1.77	23.0
8	15 14.3	15 9.4	55 49.77	1.570	55 31.75	1.432	20 31.5	1.71	24.0
9	15 5.0	15 1.0	55 15.40	1.293	55 0.71	1.157	21 12.3	1.70	25.0
10	14 57.4	14 54.3	54 47.63	−1.025	54 36.11	−0.896	21 53.5	1.74	26.0
11	14 51.5	14 49.2	54 26.11	0.771	54 17.59	0.651	22 35.9	1.80	27.0
12	14 47.3	14 45.7	54 10.48	0.535	54 4.74	0.422	23 20.4	1.90	28.0
13	14 44.5	14 43.7	54 0.34	−0.311	53 57.28	−0.199	. 6	. .	29.0
14	14 43.2	14 43.1	53 55.56	−0.088	53 55.18	+0.026	0 7.2	2.00	0.4
15	14 43.4	14 44.0	53 56.18	+0.142	53 58.60	0.263	0 56.3	2.09	1.4
16	14 45.1	14 46.6	54 2.53	+0.393	54 8.04	+0.527	1 47.1	2.13	2.4
17	14 48.6	14 51.0	54 15.19	0.665	54 24.04	0.811	2 38.4	2.13	3.4
18	14 53.9	14 57.3	54 34.69	0.966	54 47.23	1.126	3 29.2	2.09	4.4
19	15 1.2	15 5.7	55 1.71	+1.289	55 18.16	+1.453	4 18.6	2.02	5.4
20	15 10.7	15 16.3	55 36.57	1.615	55 56.92	1.775	5 6.2	1.95	6.4
21	15 22.3	15 28.9	56 19.13	1.925	56 43.07	2.062	5 52.3	1.90	7.4
22	15 35.8	15 43.1	57 8.54	+2.179	57 35.26	+2.270	6 37.6	1.88	8.4
23	15 50.6	15 58.3	58 2.89	2.329	58 31.01	2.350	7 23.2	1.92	9.4
24	16 5.9	16 13.4	58 59.09	2.322	59 26.54	2.244	8 10.3	2.02	10.4
25	16 20.5	16 27.1	59 52.71	+2.109	60 16.91	+1.915	9 0.5	2.18	11.4
26	16 33.0	16 37.9	60 38.43	1.663	60 56.59	1.355	9 55.1	2.38	12.4
27	16 41.8	16 44.4	61 10.75	0.998	61 20.40	+0.605	10 55.0	2.61	13.4
28	16 45.7	16 45.6	61 25.18	+0.189	61 24.89	−0.237	11 59.8	2.77	14.4
29	16 44.2	16 41.4	61 19.52	−0.656	61 9.25	1.051	13 7.1	2.80	15.4
30	16 37.4	16 32.2	60 54.44	1.410	60 35.61	1.720	14 13.2	2.68	16.4
31	16 26.2	16 19.4	60 13.38	1.975	59 48.44	2.171	15 14.9	2.45	17.4
32	16 12.0	16 4.3	59 21.51	−2.307	58 53.30	−2.385	16 10.8	2.21	18.4

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 1.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	16 17 57.54	2.7746	S. 26 19 21.4	5.698
1	16 20 44.11	2.7776	26 24 57.1	5.493
2	16 23 30.85	2.7803	26 30 20.5	5.288
3	16 26 17.74	2.7827	26 35 31.6	5.082
4	16 29 4.77	2.7850	26 40 30.3	4.875
5	16 31 51.94	2.7872	26 45 16.6	4.668
6	16 34 39.23	2.7891	26 49 50.5	4.460
7	16 37 26.63	2.7908	26 54 11.8	4.251
8	16 40 14.12	2.7923	26 58 20.6	4.043
9	16 43 1.70	2.7936	27 2 16.9	3.833
10	16 45 49.35	2.7947	27 6 0.6	3.623
11	16 48 37.06	2.7955	27 9 31.6	3.412
12	16 51 24.81	2.7962	27 12 50.0	3.201
13	16 54 12.60	2.7967	27 15 55.7	2.990
14	16 57 0.41	2.7969	27 18 48.8	2.779
15	16 59 48.23	2.7969	27 21 29.2	2.568
16	17 2 36.04	2.7968	27 23 56.9	2.356
17	17 5 23.84	2.7963	27 26 11.9	2.144
18	17 8 11.60	2.7957	27 28 14.2	1.933
19	17 10 59.32	2.7948	27 30 3.9	1.723
20	17 13 46.98	2.7938	27 31 40.9	1.511
21	17 16 34.57	2.7925	27 33 5.2	1.300
22	17 19 22.08	2.7911	27 34 16.9	1.090
23	17 22 9.50	2.7894	S. 27 35 16.0	0.879

SUNDAY 2.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	17 24 56.81	2.7875	S. 27 36 2.4	0.668
1	17 27 44.00	2.7854	27 36 36.2	0.459
2	17 30 31.06	2.7831	27 36 57.5	0.251
3	17 33 17.97	2.7805	27 37 6.3	−0.042
4	17 36 4.72	2.7778	27 37 2.5	+0.167
5	17 38 51.30	2.7748	27 36 46.3	0.373
6	17 41 37.70	2.7717	27 36 17.7	0.579
7	17 44 23.90	2.7683	27 35 36.8	0.785
8	17 47 9.89	2.7648	27 34 43.5	0.990
9	17 49 55.67	2.7611	27 33 38.0	1.194
10	17 52 41.22	2.7571	27 32 20.2	1.398
11	17 55 26.52	2.7529	27 30 50.2	1.601
12	17 58 11.57	2.7486	27 29 8.1	1.802
13	18 0 56.35	2.7441	27 27 14.0	2.002
14	18 3 40.86	2.7394	27 25 7.9	2.202
15	18 6 25.08	2.7346	27 22 49.8	2.400
16	18 9 9.01	2.7296	27 20 19.9	2.597
17	18 11 52.63	2.7243	27 17 38.2	2.793
18	18 14 35.93	2.7189	27 14 44.8	2.987
19	18 17 18.90	2.7133	27 11 39.8	3.179
20	18 20 1.53	2.7077	27 8 23.3	3.371
21	18 22 43.82	2.7018	27 4 55.3	3.563
22	18 25 25.75	2.6958	27 1 15.8	3.752
23	18 28 7.32	2.6897	26 57 25.1	3.939
24	18 30 48.51	2.6833	S. 26 53 23.1	4.126

MONDAY 3.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	18 30 48.51	2.6833	S. 26 53 23.1	4.126
1	18 33 29.31	2.6768	26 49 10.0	4.310
2	18 36 9.72	2.6702	26 44 45.9	4.493
3	18 38 49.73	2.6634	26 40 10.8	4.675
4	18 41 29.33	2.6566	26 35 24.9	4.855
5	18 44 8.52	2.6497	26 30 28.2	5.034
6	18 46 47.29	2.6425	26 25 20.8	5.211
7	18 49 25.62	2.6353	26 20 2.9	5.386
8	18 52 3.52	2.6280	26 14 34.5	5.560
9	18 54 40.98	2.6206	26 8 55.7	5.732
10	18 57 17.99	2.6131	26 3 6.7	5.902
11	18 59 54.55	2.6054	25 57 7.5	6.070
12	19 2 30.64	2.5977	25 50 58.3	6.237
13	19 5 6.27	2.5898	25 44 39.1	6.402
14	19 7 41.42	2.5819	25 38 10.1	6.564
15	19 10 16.10	2.5739	25 31 31.4	6.726
16	19 12 50.29	2.5658	25 24 43.0	6.886
17	19 15 24.00	2.5578	25 17 45.1	7.043
18	19 17 57.22	2.5496	25 10 37.8	7.199
19	19 20 29.95	2.5413	25 3 21.2	7.353
20	19 23 2.18	2.5330	24 55 55.4	7.505
21	19 25 33.91	2.5246	24 48 20.6	7.655
22	19 28 5.13	2.5162	24 40 36.8	7.804
23	19 30 35.85	2.5078	S. 24 32 44.1	7.951

TUESDAY 4.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	19 33 6.06	2.4993	S. 24 24 42.7	8.095
1	19 35 35.76	2.4907	24 16 32.7	8.238
2	19 38 4.94	2.4820	24 8 14.2	8.378
3	19 40 33.60	2.4734	23 59 47.3	8.518
4	19 43 1.75	2.4648	23 51 12.1	8.655
5	19 45 29.38	2.4562	23 42 28.7	8.790
6	19 47 56.49	2.4475	23 33 37.3	8.923
7	19 50 23.08	2.4388	23 24 38.0	9.054
8	19 52 49.14	2.4301	23 15 30.8	9.18[illegible]
9	19 55 14.69	2.4214	23 6 15.9	9.31[illegible]
10	19 57 39.71	2.4127	22 56 53.4	9.43[illegible]
11	20 0 4.21	2.4039	22 47 23.4	9.5[illegible]
12	20 2 28.18	2.3952	22 37 46.0	9.6[illegible]
13	20 4 51.63	2.3865	22 28 1.4	9.80[illegible]
14	20 7 14.56	2.3778	22 18 9.6	9.9[illegible]
15	20 9 36.97	2.3692	22 8 10.8	10.0[illegible]
16	20 11 58.86	2.3605	21 58 5.1	10.1[illegible]
17	20 14 20.23	2.3519	21 47 52.6	10.26[illegible]
18	20 16 41.09	2.3433	21 37 33.4	10.37[illegible]
19	20 19 1.42	2.3346	21 27 7.5	10.48[illegible]
20	20 21 21.24	2.3261	21 16 35.2	10.59[illegible]
21	20 23 40.55	2.3175	21 5 56.5	10.6[illegible]
22	20 25 59.34	2.3090	20 55 11.5	10.80[illegible]
23	20 28 17.63	2.3096	20 44 20.4	10.90[illegible]
24	20 30 35.41	2.2921	S. 20 33 23.2	11.00[illegible]

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 5.					FRIDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	20 30 35.41	2.2921	S. 20 33 23.2	11.003	0	22 12 1.33	1.9628	S. 10 20 41.7	13.972
1	20 32 52.68	2.2837	20 22 20.1	11.101	1	22 13 58.95	1.9578	10 6 42.5	14.002
2	20 35 9.45	2.2753	20 11 11.1	11.198	2	22 15 56.27	1.9530	9 52 41.5	14.031
3	20 37 25.72	2.2670	19 59 56.4	11.292	3	22 17 53.31	1.9483	9 38 38.8	14.058
4	20 39 41.49	2.2588	19 48 36.1	11.385	4	22 19 50.06	1.9436	9 24 34.6	14.083
5	20 41 56.77	2.2505	19 37 10.2	11.477	5	22 21 46.54	1.9391	9 10 28.8	14.108
6	20 44 11.55	2.2423	19 25 38.9	11.566	6	22 23 42.75	1.9346	8 56 21.6	14.132
7	20 46 25.85	2.2343	19 14 2.3	11.653	7	22 25 38.69	1.9302	8 42 13.0	14.155
8	20 48 39.66	2.2262	19 2 20.5	11.740	8	22 27 34.37	1.9259	8 28 3.0	14.177
9	20 50 52.99	2.2182	18 50 33.5	11.825	9	22 29 29.80	1.9217	8 13 51.8	14.198
10	20 53 5.84	2.2103	18 38 41.5	11.908	10	22 31 24.97	1.9175	7 59 39.3	14.218
11	20 55 18.22	2.2024	18 26 44.6	11.988	11	22 33 19.90	1.9135	7 45 25.7	14.236
12	20 57 30.13	2.1946	18 14 42.9	12.068	12	22 35 14.59	1.9095	7 31 11.0	14.253
13	20 59 41.57	2.1868	18 2 36.4	12.147	13	22 37 9.04	1.9057	7 16 55.3	14.270
14	21 1 52.55	2.1791	17 50 25.3	12.223	14	22 39 3.27	1.9020	7 2 38.6	14.286
15	21 4 3.06	2.1714	17 38 9.6	12.298	15	22 40 57.28	1.8983	6 48 21.0	14.301
16	21 6 13.12	2.1639	17 25 49.5	12.371	16	22 42 51.06	1.8946	6 34 2.5	14.314
17	21 8 22.73	2.1564	17 13 25.1	12.443	17	22 44 44.63	1.8911	6 19 43.3	14.327
18	21 10 31.89	2.1490	17 0 56.4	12.513	18	22 46 37.99	1.8876	6 5 23.3	14.338
19	21 12 40.61	2.1417	16 48 23.5	12.582	19	22 48 31.14	1.8843	5 51 2.7	14.349
20	21 14 48.89	2.1343	16 35 46.6	12.648	20	22 50 24.10	1.8810	5 36 41.4	14.359
21	21 16 56.73	2.1271	16 23 5.7	12.714	21	22 52 16.86	1.8778	5 22 19.6	14.368
22	21 19 4.14	2.1200	16 10 20.9	12.778	22	22 54 9.43	1.8747	5 7 57.2	14.377
23	21 21 11.13	2.1129	S. 15 57 32.3	12.842	23	22 56 1.82	1.8717	S. 4 53 34.4	14.383
	THURSDAY 6.					SATURDAY 8.			
0	21 23 17.69	2.1059	S. 15 44 39.9	12.903	0	22 57 54.03	1.8688	S. 4 39 11.2	14.389
1	21 25 23.84	2.0991	15 31 44.0	12.962	1	22 59 46.07	1.8659	4 24 47.7	14.395
2	21 27 29.58	2.0923	15 18 44.5	13.021	2	23 1 37.94	1.8631	4 10 23.8	14.400
3	21 29 34.91	2.0854	15 5 41.5	13.078	3	23 3 29.64	1.8604	3 55 59.7	14.403
4	21 31 39.83	2.0788	14 52 35.2	13.133	4	23 5 21.19	1.8578	3 41 35.4	14.406
5	21 33 44.36	2.0722	14 39 25.6	13.188	5	23 7 12.58	1.8553	3 27 11.0	14.408
6	21 35 48.49	2.0657	14 26 12.7	13.241	6	23 9 3.82	1.8528	3 12 46.5	14.408
7	21 37 52.24	2.0593	14 12 56.7	13.292	7	23 10 54.92	1.8505	2 58 22.0	14.408
8	21 39 55.60	2.0528	13 59 37.7	13.342	8	23 12 45.88	1.8483	2 43 57.5	14.408
9	21 41 58.58	2.0466	13 46 15.7	13.391	9	23 14 36.71	1.8461	2 29 33.1	14.406
10	21 44 1.19	2.0404	13 32 50.8	13.438	10	23 16 27.41	1.8439	2 15 8.8	14.403
11	21 46 3.43	2.0343	13 19 23.1	13.484	11	23 18 17.98	1.8419	2 0 44.7	14.400
12	21 48 5.31	2.0283	13 5 52.7	13.528	12	23 20 8.44	1.8400	1 46 20.8	14.396
13	21 50 6.83	2.0224	12 52 19.7	13.573	13	23 21 58.78	1.8381	1 31 57.2	14.390
14	21 52 8.00	2.0166	12 38 44.0	13.615	14	23 23 49.01	1.8363	1 17 34.0	14.384
15	21 54 8.82	2.0108	12 25 5.9	13.656	15	23 25 39.13	1.8345	1 3 11.1	14.378
16	21 56 9.29	2.0051	12 11 25.3	13.697	16	23 27 29.15	1.8329	0 48 48.6	14.371
17	21 58 9.43	1.9995	11 57 42.3	13.735	17	23 29 19.08	1.8314	0 34 26.6	14.363
18	22 0 9.23	1.9939	11 43 57.1	13.772	18	23 31 8.92	1.8299	0 20 5.1	14.353
19	22 2 8.70	1.9885	11 30 9.7	13.808	19	23 32 58.67	1.8285	S. 0 5 44.2	14.343
20	22 4 7.85	1.9833	11 16 20.1	13.844	20	23 34 48.34	1.8272	N. 0 8 36.0	14.332
21	22 6 6.69	1.9780	11 2 28.4	13.878	21	23 36 37.93	1.8258	0 22 55.6	14.321
22	22 8 5.21	1.9728	10 48 34.7	13.911	22	23 38 27.44	1.8247	0 37 14.5	14.308
23	22 10 3.42	1.9677	10 34 39.1	13.942	23	23 40 16.89	1.8237	0 51 32.6	14.295
24	22 12 1.33	1.9628	S. 10 20 41.7	13.972	24	23 42 6.28	1.8227	N. 1 5 49.9	14.281

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 9.					**TUESDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 42 6.28	1.8227	N. 1 5 49.9	14.281	0	1 9 46.85	1.8559	N. 12 0 30.5	12.703
1	23 43 55.61	1.8217	1 20 6.3	14.266	1	1 11 38.27	1.8581	12 13 11.2	12.652
2	23 45 44.88	1.8208	1 34 21.8	14.250	2	1 13 29.82	1.8603	12 25 48.7	12.598
3	23 47 34.11	1.8201	1 48 36.3	14.234	3	1 15 21.51	1.8628	12 38 23.0	12.545
4	23 49 23.29	1.8193	2 2 49.9	14.218	4	1 17 13.35	1.8651	12 50 54.1	12.492
5	23 51 12.43	1.8188	2 17 2.4	14.199	5	1 19 5.32	1.8674	13 3 22.0	12.437
6	23 53 1.54	1.8182	2 31 13.8	14.180	6	1 20 57.44	1.8700	13 15 46.5	12.380
7	23 54 50.61	1.8177	2 45 24.0	14.161	7	1 22 49.72	1.8726	13 28 7.6	12.324
8	23 56 39.66	1.8173	2 59 33.1	14.142	8	1 24 42.15	1.8751	13 40 25.4	12.268
9	23 58 28.68	1.8169	3 13 41.0	14.120	9	1 26 34.73	1.8777	13 52 39.7	12.209
10	0 0 17.69	1.8167	3 27 47.5	14.098	10	1 28 27.47	1.8803	14 4 50.5	12.150
11	0 2 6.68	1.8164	3 41 52.7	14.075	11	1 30 20.37	1.8831	14 16 57.7	12.091
12	0 3 55.66	1.8163	3 55 56.5	14.052	12	1 32 13.44	1.8859	14 29 1.4	12.031
13	0 5 44.64	1.8163	4 9 58.9	14.028	13	1 34 6.68	1.8887	14 41 1.4	11.969
14	0 7 33.61	1.8163	4 23 59.9	14.003	14	1 36 0.08	1.8915	14 52 57.7	11.907
15	0 9 22.59	1.8163	4 37 59.3	13.978	15	1 37 53.66	1.8944	15 4 50.2	11.844
16	0 11 11.57	1.8165	4 51 57.2	13.951	16	1 39 47.41	1.8973	15 16 39.0	11.782
17	0 13 0.57	1.8168	5 5 53.4	13.923	17	1 41 41.34	1.9003	15 28 24.0	11.717
18	0 14 49.58	1.8170	5 19 48.0	13.896	18	1 43 35.45	1.9033	15 40 5.0	11.651
19	0 16 38.61	1.8173	5 33 40.9	13.868	19	1 45 29.74	1.9064	15 51 42.1	11.585
20	0 18 27.66	1.8178	5 47 32.1	13.838	20	1 47 24.22	1.9096	16 3 15.2	11.518
21	0 20 16.75	1.8183	6 1 21.5	13.808	21	1 49 18.89	1.9127	16 14 44.3	11.451
22	0 22 5.86	1.8190	6 15 9.0	13.777	22	1 51 13.74	1.9158	16 26 9.3	11.383
23	0 23 55.01	1.8196	N. 6 28 54.7	13.745	23	1 53 8.79	1.9191	N. 16 37 30.2	11.313
	MONDAY 10.					**WEDNESDAY 12.**			
0	0 25 44.21	1.8203	N. 6 42 38.4	13.712	0	1 55 4.03	1.9223	N. 16 48 46.8	11.242
1	0 27 33.45	1.8210	6 56 20.1	13.678	1	1 56 59.47	1.9256	16 59 59.2	11.172
2	0 29 22.73	1.8218	7 9 59.8	13.645	2	1 58 55.10	1.9289	17 11 7.4	11.100
3	0 31 12.07	1.8228	7 23 37.5	13.611	3	2 0 50.94	1.9323	17 22 11.2	11.028
4	0 33 1.46	1.8237	7 37 13.1	13.575	4	2 2 46.98	1.9357	17 33 10.7	10.955
5	0 34 50.91	1.8248	7 50 46.5	13.538	5	2 4 43.22	1.9391	17 44 5.8	10.881
6	0 36 40.43	1.8258	8 4 17.7	13.501	6	2 6 39.67	1.9426	17 54 56.4	10.805
7	0 38 30.01	1.8270	8 17 46.6	13.463	7	2 8 36.33	1.9461	18 5 42.4	10.729
8	0 40 19.67	1.8283	8 31 13.2	13.424	8	2 10 33.20	1.9497	18 16 23.9	10.653
9	0 42 9.40	1.8295	8 44 37.5	13.386	9	2 12 30.29	1.9532	18 27 0.7	10.575
10	0 43 59.21	1.8308	8 57 59.5	13.346	10	2 14 27.58	1.9567	18 37 32.9	10.498
11	0 45 49.10	1.8323	9 11 19.0	13.304	11	2 16 25.09	1.9603	18 48 0.4	10.418
12	0 47 39.08	1.8338	9 24 36.0	13.263	12	2 18 22.82	1.9640	18 58 23.1	10.338
13	0 49 29.15	1.8353	9 37 50.5	13.221	13	2 20 20.77	1.9676	19 8 41.0	10.258
14	0 51 19.31	1.8368	9 51 2.5	13.178	14	2 22 18.93	1.9712	19 18 54.0	10.175
15	0 53 9.57	1.8385	10 4 11.8	13.133	15	2 24 17.31	1.9749	19 29 2.0	10.093
16	0 54 59.93	1.8403	10 17 18.4	13.088	16	2 26 15.92	1.9787	19 39 5.1	10.010
17	0 56 50.40	1.8420	10 30 22.4	13.043	17	2 28 14.75	1.9823	19 49 3.2	9.926
18	0 58 40.97	1.8438	10 43 23.6	12.997	18	2 30 13.80	1.9861	19 58 56.2	9.841
19	1 0 31.65	1.8457	10 56 22.0	12.950	19	2 32 13.08	1.9898	20 8 44.1	9.756
20	1 2 22.45	1.8477	11 9 17.6	12.903	20	2 34 12.58	1.9936	20 18 26.9	9.669
21	1 4 13.37	1.8496	11 22 10.3	12.853	21	2 36 12.31	1.9974	20 28 4.4	9.582
22	1 6 4.40	1.8516	11 35 0.0	12.804	22	2 38 12.27	2.0013	20 37 36.7	9.493
23	1 7 55.56	1.8538	11 47 46.8	12.754	23	2 40 12.46	2.0051	20 47 3.6	9.404
24	1 9 46.85	1.8559	N. 12 0 30.5	12.703	24	2 42 12.88	2.0089	N. 20 56 25.2	9.315

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 13.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	2 42 12.88	2.0089	N. 20 56 25.2	9.315
1	2 44 13.53	2.0127	21 5 41.4	9.224
2	2 46 14.40	2.0165	21 14 52.1	9.133
3	2 48 15.51	2.0204	21 23 57.3	9.041
4	2 50 16.85	2.0243	21 32 57.0	8.948
5	2 52 18.42	2.0281	21 41 51.0	8.853
6	2 54 20.22	2.0320	21 50 39.4	8.759
7	2 56 22.26	2.0359	21 59 22.1	8.663
8	2 58 24.53	2.0398	22 7 59.0	8.567
9	3 0 27.03	2.0436	22 16 30.1	8.470
10	3 2 29.76	2.0474	22 24 55.4	8.373
11	3 4 32.72	2.0513	22 33 14.8	8.274
12	3 6 35.92	2.0553	22 41 28.3	8.175
13	3 8 39.35	2.0591	22 49 35.8	8.074
14	3 10 43.01	2.0628	22 57 37.2	7.973
15	3 12 46.89	2.0667	23 5 32.6	7.872
16	3 14 51.01	2.0706	23 13 21.8	7.769
17	3 16 55.36	2.0744	23 21 4.9	7.666
18	3 18 59.94	2.0782	23 28 41.7	7.562
19	3 21 4.74	2.0819	23 36 12.3	7.458
20	3 23 9.77	2.0857	23 43 36.6	7.352
21	3 25 15.02	2.0894	23 50 54.5	7.245
22	3 27 20.50	2.0932	23 58 6.0	7.138
23	3 29 26.20	2.0968	N. 24 5 11.1	7.031

FRIDAY 14.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	3 31 32.12	2.1005	N. 24 12 9.7	6.923
1	3 33 38.26	2.1042	24 19 1.8	6.813
2	3 35 44.62	2.1078	24 25 47.3	6.703
3	3 37 51.20	2.1114	24 32 26.1	6.592
4	3 39 57.99	2.1149	24 38 58.3	6.481
5	3 42 4.99	2.1185	24 45 23.8	6.369
6	3 44 12.21	2.1221	24 51 42.6	6.256
7	3 46 19.64	2.1256	24 57 54.5	6.142
8	3 48 27.28	2.1290	25 3 59.6	6.028
9	3 50 35.12	2.1323	25 9 57.9	5.914
10	3 52 43.16	2.1358	25 15 49.3	5.798
11	3 54 51.41	2.1392	25 21 33.7	5.682
12	3 56 59.86	2.1424	25 27 11.1	5.565
13	3 59 8.50	2.1457	25 32 41.5	5.448
14	4 1 17.34	2.1489	25 38 4.9	5.330
15	4 3 26.37	2.1521	25 43 21.1	5.211
16	4 5 35.59	2.1553	25 48 30.2	5.092
17	4 7 45.00	2.1583	25 53 32.1	4.972
18	4 9 54.59	2.1613	25 58 26.8	4.852
19	4 12 4.36	2.1643	26 3 14.3	4.731
20	4 14 14.31	2.1673	26 7 54.5	4.609
21	4 16 24.44	2.1703	26 12 27.4	4.487
22	4 18 34.74	2.1730	26 16 52.9	4.364
23	4 20 45.20	2.1758	26 21 11.1	4.241
24	4 22 55.83	2.1785	N. 26 25 21.8	4.117

SATURDAY 15.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	4 22 55.83	2.1785	N. 26 25 21.8	4.117
1	4 25 6.62	2.1812	26 29 25.1	3.993
2	4 27 17.57	2.1838	26 33 21.0	3.868
3	4 29 28.68	2.1864	26 37 9.3	3.743
4	4 31 39.94	2.1888	26 40 50.1	3.617
5	4 33 51.34	2.1913	26 44 23.3	3.491
6	4 36 2.89	2.1937	26 47 49.0	3.364
7	4 38 14.58	2.1959	26 51 7.0	3.237
8	4 40 26.40	2.1982	26 54 17.4	3.109
9	4 42 38.36	2.2004	26 57 20.1	2.981
10	4 44 50.45	2.2025	27 0 15.1	2.853
11	4 47 2.66	2.2045	27 3 2.4	2.724
12	4 49 14.99	2.2065	27 5 42.0	2.595
13	4 51 27.44	2.2084	27 8 13.8	2.466
14	4 53 40.00	2.2103	27 10 37.9	2.336
15	4 55 52.67	2.2121	27 12 54.1	2.205
16	4 58 5.45	2.2138	27 15 2.5	2.075
17	5 0 18.32	2.2153	27 17 3.1	1.944
18	5 2 31.29	2.2169	27 18 55.8	1.813
19	5 4 44.35	2.2183	27 20 40.7	1.683
20	5 6 57.49	2.2198	27 22 17.7	1.550
21	5 9 10.72	2.2211	27 23 46.7	1.418
22	5 11 24.02	2.2223	27 25 7.8	1.285
23	5 13 37.40	2.2236	N. 27 26 20.9	1.153

SUNDAY 16.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	5 15 50.85	2.2247	N. 27 27 26.1	1.021
1	5 18 4.36	2.2258	27 28 23.4	0.888
2	5 20 17.94	2.2268	27 29 12.6	0.754
3	5 22 31.57	2.2276	27 29 53.9	0.621
4	5 24 45.25	2.2283	27 30 27.1	0.488
5	5 26 58.97	2.2291	27 30 52.4	0.355
6	5 29 12.74	2.2298	27 31 9.7	0.221
7	5 31 26.54	2.2303	27 31 18.9	+0.087
8	5 33 40.38	2.2308	27 31 20.1	−0.047
9	5 35 54.24	2.2313	27 31 13.3	0.181
10	5 38 8.13	2.2317	27 30 58.4	0.315
11	5 40 22.04	2.2319	27 30 35.5	0.448
12	5 42 35.96	2.2321	27 30 4.6	0.583
13	5 44 49.89	2.2323	27 29 25.6	0.717
14	5 47 3.83	2.2323	27 28 38.6	0.851
15	5 49 17.77	2.2323	27 27 43.5	0.985
16	5 51 31.70	2.2321	27 26 40.4	1.119
17	5 53 45.62	2.2319	27 25 29.2	1.253
18	5 55 59.53	2.2318	27 24 10.0	1.388
19	5 58 13.43	2.2314	27 22 42.7	1.522
20	6 0 27.30	2.2310	27 21 7.4	1.655
21	6 2 41.15	2.2305	27 19 24.1	1.788
22	6 4 54.96	2.2299	27 17 32.8	1.922
23	6 7 8.74	2.2293	27 15 33.5	2.056
24	6 9 22.47	2.2285	N. 27 13 26.1	2.189

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 17.					WEDNESDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	6 9 22.47	2.2285	N. 27 13 26.1	2.189	0	7 54 24.85	2.1312	N. 23 0 19.7	8.191
1	6 11 36.16	2.2278	27 11 10.8	2.323	1	7 56 32.63	2.1283	22 52 4.9	8.303
2	6 13 49.81	2.2270	27 8 47.4	2.456	2	7 58 40.25	2.1256	22 43 43.3	8.416
3	6 16 3.40	2.2261	27 6 16.1	2.588	3	8 0 47.70	2.1228	22 35 15.0	8.528
4	6 18 16.94	2.2251	27 3 36.8	2.722	4	8 2 54.98	2.1199	22 26 40.0	8.638
5	6 20 30.41	2.2240	27 0 49.5	2.854	5	8 5 2.09	2.1171	22 17 58.4	8.748
6	6 22 43.82	2.2229	26 57 54.3	2.986	6	8 7 9.03	2.1143	22 9 10.3	8.857
7	6 24 57.16	2.2218	26 54 51.2	3.118	7	8 9 15.80	2.1114	22 0 15.6	8.966
8	6 27 10.43	2.2205	26 51 40.2	3.250	8	8 11 22.40	2.1085	21 51 14.4	9.074
9	6 29 23.62	2.2193	26 48 21.2	3.382	9	8 13 28.82	2.1057	21 42 6.7	9.182
10	6 31 36.74	2.2179	26 44 54.4	3.513	10	8 15 35.08	2.1029	21 32 52.6	9.288
11	6 33 49.77	2.2164	26 41 19.7	3.643	11	8 17 41.17	2.1001	21 23 32.1	9.394
12	6 36 2.71	2.2149	26 37 37.2	3.774	12	8 19 47.09	2.0973	21 14 5.3	9.499
13	6 38 15.56	2.2133	26 33 46.8	3.905	13	8 21 52.84	2.0945	21 4 32.2	9.604
14	6 40 28.31	2.2117	26 29 48.6	4.035	14	8 23 58.43	2.0917	20 54 52.8	9.709
15	6 42 40.96	2.2100	26 25 42.6	4.164	15	8 26 3.84	2.0888	20 45 7.1	9.813
16	6 44 53.51	2.2083	26 21 28.9	4.293	16	8 28 9.09	2.0861	20 35 15.3	9.914
17	6 47 5.95	2.2065	26 17 7.4	4.423	17	8 30 14.17	2.0833	20 25 17.4	10.017
18	6 49 18.29	2.2048	26 12 38.2	4.551	18	8 32 19.09	2.0807	20 15 13.3	10.118
19	6 51 30.52	2.2028	26 8 1.3	4.679	19	8 34 23.85	2.0779	20 5 3.2	10.218
20	6 53 42.63	2.2008	26 3 16.7	4.808	20	8 36 28.44	2.0752	19 54 47.1	10.318
21	6 55 54.62	2.1988	25 58 24.4	4.935	21	8 38 32.87	2.0725	19 44 25.0	10.418
22	6 58 6.49	2.1968	25 53 24.5	5.063	22	8 40 37.14	2.0698	19 33 57.0	10.516
23	7 0 18.24	2.1948	N. 25 48 16.9	5.189	23	8 42 41.25	2.0673	N. 19 23 23.1	10.613
	TUESDAY 18.					THURSDAY 20.			
0	7 2 29.86	2.1926	N. 25 43 1.8	5.315	0	8 44 45.21	2.0647	N. 19 12 43.4	10.710
1	7 4′41.35	2.1904	25 37 39.1	5.441	1	8 46 49.01	2.0621	19 1 57.9	10.807
2	7 6 52.71	2.1882	25 32 8.9	5.566	2	8 48 52.66	2.0595	18 51 6.6	10.903
3	7 9 3.93	2.1859	25 26 31.2	5.691	3	8 50 56.15	2.0569	18 40 9.6	10.998
4	7 11 15.02	2.1837	25 20 46.0	5.815	4	8 52 59.49	2.0545	18 29 6.9	11.092
5	7 13 25.97	2.1813	25 14 53.4	5.939	5	8 55 2.69	2.0521	18 17 58.6	11.185
6	7 15 36.77	2.1788	25 8 53.3	6.063	6	8 57 5.74	2.0496	18 6 44.7	11.278
7	7 17 47.43	2.1764	25 2 45.9	6.185	7	8 59 8.64	2.0472	17 55 25.3	11.369
8	7 19 57.94	2.1740	24 56 31.1	6.308	8	9 1 11.40	2.0448	17 44 0.4	11.461
9	7 22 8.31	2.1715	24 50 9.0	6.429	9	9 3 14.02	2.0425	17 32 30.0	11.551
10	7 24 18.52	2.1689	24 43 39.6	6.551	10	9 5 16.50	2.0402	17 20 54.3	11.640
11	7 26 28.58	2.1664	24 37 2.9	6.673	11	9 7 18.84	2.0379	17 9 13.2	11.730
12	7 28 38.49	2.1638	24 30 18.9	6.793	12	9 9 21.05	2.0358	16 57 26.7	11.818
13	7 30 48.24	2.1613	24 23 27.8	6.912	13	9 11 23.13	2.0336	16 45 35.0	11.905
14	7 32 57.84	2.1586	24 16 29.5	7.032	14	9 13 25.08	2.0314	16 33 38.1	11.992
15	7 35 7.27	2.1559	24 9 24.0	7.151	15	9 15 26.90	2.0293	16 21 36.0	12.078
16	7 37 16.55	2.1533	24 2 11.4	7.268	16	9 17 28.60	2.0273	16 9 28.7	12.163
17	7 39 25.66	2.1505	23 54 51.8	7.385	17	9 19 30.18	2.0253	15 57 16.4	12.248
18	7 41 34.61	2.1478	23 47 25.2	7.502	18	9 21 31.64	2.0233	15 44 59.0	12.331
19	7 43 43.40	2.1451	23 39 51.6	7.618	19	9 23 32.98	2.0214	15 32 36.7	12.413
20	7 45 52.02	2.1423	23 32 11.0	7.734	20	9 25 34.21	2.0196	15 20 9.4	12.496
21	7 48 0.48	2.1396	23 24 23.5	7.849	21	9 27 35.33	2.0178	15 7 37.2	12.578
22	7 50 8.77	2.1368	23 16 29.1	7.964	22	9 29 36.34	2.0160	14 55 0.1	12.658
23	7 52 16.89	2.1340	23 8 27.8	8.078	23	9 31 37.25	2.0143	14 42 18.2	12.738
24	7 54 24.85	2.1312	N. 23 0 19.7	8.191	24	9 33 38.05	2.0126	N. 14 29 31.6	12.817

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 21.					SUNDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 33 38.05	2.0126	N. 14 29 31.6	12.817	0	11 9 31.45	2.0106	N. 2 59 7.8	15.604
1	9 35 38.76	2.0110	14 16 40.2	12.895	1	11 11 32.14	2.0125	2 43 30.5	15.639
2	9 37 39.37	2.0094	14 3 44.2	12.972	2	11 13 32.95	2.0144	2 27 51.1	15.673
3	9 39 39.89	2.0079	13 50 43.6	13.049	3	11 15 33.87	2.0164	2 12 9.8	15.704
4	9 41 40.32	2.0064	13 37 38.3	13.125	4	11 17 34.92	2.0186	1 56 26.6	15.736
5	9 43 40.66	2.0051	13 24 28.6	13.199	5	11 19 36.10	2.0208	1 40 41.5	15.767
6	9 45 40.93	2.0038	13 11 14.4	13.274	6	11 21 37.42	2.0232	1 24 54.6	15.795
7	9 47 41.12	2.0026	12 57 55.7	13.348	7	11 23 38.88	2.0256	1 9 6.1	15.823
8	9 49 41.24	2.0013	12 44 32.6	13.421	8	11 25 40.49	2.0280	0 53 15.9	15.850
9	9 51 41.28	2.0002	12 31 5.2	13.492	9	11 27 42.24	2.0305	0 37 24.1	15.875
10	9 53 41.26	1.9991	12 17 33.6	13.563	10	11 29 44.15	2.0333	0 21 30.9	15.898
11	9 55 41.17	1.9980	12 3 57.7	13.633	11	11 31 46.23	2.0361	N. 0 5 36.3	15.922
12	9 57 41.02	1.9971	11 50 17.6	13.703	12	11 33 48.48	2.0389	S. 0 10 19.7	15.944
13	9 59 40.82	1.9962	11 36 33.4	13.771	13	11 35 50.90	2.0418	0 26 17.0	15.964
14	10 1 40.56	1.9953	11 22 45.1	13.839	14	11 37 53.50	2.0448	0 42 15.4	15.983
15	10 3 40.26	1.9946	11 8 52.7	13.906	15	11 39 56.28	2.0479	0 58 15.0	16.002
16	10 5 39.91	1.9939	10 54 56.4	13.972	16	11 41 59.25	2.0512	1 14 15.7	16.019
17	10 7 39.53	1.9933	10 40 56.1	14.037	17	11 44 2.42	2.0545	1 30 17.3	16.034
18	10 9 39.11	1.9927	10 26 52.0	14.101	18	11 46 5.79	2.0578	1 46 19.8	16.048
19	10 11 38.65	1.9922	10 12 44.0	14.165	19	11 48 9.36	2.0613	2 2 23.1	16.061
20	10 13 38.17	1.9918	9 58 32.2	14.228	20	11 50 13.15	2.0650	2 18 27.1	16.073
21	10 15 37.67	1.9914	9 44 16.7	14.289	21	11 52 17.16	2.0687	2 34 31.8	16.083
22	10 17 37.14	1.9911	9 29 57.5	14.350	22	11 54 21.39	2.0724	2 50 37.0	16.092
23	10 19 36.60	1.9909	N. 9 15 34.7	14.410	23	11 56 25.85	2.0763	S. 3 6 42.8	16.099
	SATURDAY 22.					MONDAY 24.			
0	10 21 36.05	1.9908	N. 9 1 8.3	14.469	0	11 58 30.55	2.0803	S. 3 22 48.9	16.104
1	10 23 35.49	1.9907	8 46 38.4	14.527	1	12 0 35.49	2.0843	3 38 55.3	16.109
2	10 25 34.93	1.9907	8 32 5.1	14.584	2	12 2 40.67	2.0884	3 55 2.0	16.113
3	10 27 34.37	1.9908	8 17 28.3	14.641	3	12 4 46.10	2.0927	4 11 8.8	16.114
4	10 29 33.82	1.9909	8 2 48.2	14.696	4	12 6 51.79	2.0971	4 27 15.7	16.115
5	10 31 33.28	1.9912	7 48 4.8	14.751	5	12 8 57.75	2.1016	4 43 22.6	16.113
6	10 33 32.76	1.9915	7 33 18.1	14.805	6	12 11 3.98	2.1061	4 59 29.3	16.110
7	10 35 32.26	1.9918	7 18 28.2	14.858	7	12 13 10.48	2.1107	5 15 35.8	16.106
8	10 37 31.78	1.9923	7 3 35.2	14.909	8	12 15 17.26	2.1154	5 31 42.0	16.100
9	10 39 31.33	1.9928	6 48 39.1	14.960	9	12 17 24.33	2.1203	5 47 47.8	16.093
10	10 41 30.92	1.9934	6 33 40.0	15.010	10	12 19 31.69	2.1252	6 3 53.1	16.083
11	10 43 30.54	1.9941	6 18 37.9	15.059	11	12 21 39.35	2.1303	6 19 57.8	16.073
12	10 45 30.21	1.9949	6 3 32.9	15.107	12	12 23 47.32	2.1353	6 36 1.9	16.061
13	10 47 29.93	1.9958	5 48 25.1	15.153	13	12 25 55.59	2.1405	6 52 5.1	16.047
14	10 49 29.70	1.9967	5 33 14.5	15.200	14	12 28 4.18	2.1458	7 8 7.5	16.032
15	10 51 29.53	1.9977	5 18 1.1	15.245	15	12 30 13.08	2.1511	7 24 8.9	16.014
16	10 53 29.42	1.9988	5 2 45.1	15.289	16	12 32 22.31	2.1566	7 40 9.2	15.996
17	10 55 29.38	1.9999	4 47 26.4	15.333	17	12 34 31.87	2.1622	7 56 8.4	15.976
18	10 57 29.41	2.0013	4 32 5.2	15.374	18	12 36 41.77	2.1678	8 12 6.3	15.953
19	10 59 29.53	2.0027	4 16 41.5	15.415	19	12 38 52.01	2.1736	8 28 2.7	15.928
20	11 1 29.73	2.0040	4 1 15.4	15.455	20	12 41 2.60	2.1794	8 43 57.7	15.903
21	11 3 30.01	2.0055	3 45 46.9	15.494	21	12 43 13.54	2.1853	8 59 51.1	15.876
22	11 5 30.39	2.0072	3 30 16.1	15.533	22	12 45 24.84	2.1914	9 15 42.8	15.847
23	11 7 30.87	2.0088	3 14 43.0	15.569	23	12 47 36.51	2.1975	9 31 32.7	15.815
24	11 9 31.45	2.0106	N. 2 59 7.8	15.604	24	12 49 48.54	2.2037	S. 9 47 20.6	15.782

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 25.					THURSDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 49 48.54	2.2037	S. 9 47 20.6	15.782	0	14 44 5.08	2.5757	S. 21 7 57.5	11.723
1	12 52 0.95	2.2099	10 3 6.5	15.748	1	14 46 39.87	2.5839	21 19 36.7	11.583
2	12 54 13.73	2.2163	10 18 50.3	15.711	2	14 49 15.15	2.5922	21 31 7.4	11.440
3	12 56 26.90	2.2228	10 34 31.8	15.672	3	14 51 50.93	2.6004	21 42 29.5	11.294
4	12 58 40.46	2.2293	10 50 10.9	15.631	4	14 54 27.20	2.6086	21 53 42.7	11.146
5	13 0 54.42	2.2360	11 5 47.5	15.589	5	14 57 3.96	2.6167	22 4 47.0	10.997
6	13 3 8.78	2.2427	11 21 21.6	15.545	6	14 59 41.20	2.6248	22 15 42.3	10.845
7	13 5 23.54	2.2494	11 36 52.9	15.498	7	15 2 18.93	2.6328	22 26 28.4	10.690
8	13 7 38.71	2.2563	11 52 21.4	15.450	8	15 4 57.13	2.6406	22 37 5.1	10.533
9	13 9 54.29	2.2632	12 7 46.9	15.400	9	15 7 35.80	2.6485	22 47 32.4	10.374
10	13 12 10.29	2.2703	12 23 9.4	15.348	10	15 10 14.95	2.6563	22 57 50.0	10.213
11	13 14 26.72	2.2774	12 38 28.7	15.293	11	15 12 54.56	2.6640	23 7 57.9	10.050
12	13 16 43.58	2.2846	12 53 44.6	15.237	12	15 15 34.63	2.6717	23 17 56.0	9.885
13	13 19 0.87	2.2918	13 8 57.1	15.179	13	15 18 15.16	2.6792	23 27 44.1	9.717
14	13 21 18.60	2.2992	13 24 6.1	15.118	14	15 20 56.13	2.6866	23 37 22.0	9.547
15	13 23 36.77	2.3066	13 39 11.3	15.055	15	15 23 37.55	2.6940	23 46 49.7	9.375
16	13 25 55.39	2.3140	13 54 12.7	14.990	16	15 26 19.41	2.7013	23 56 7.0	9.201
17	13 28 14.45	2.3215	14 9 10.1	14.923	17	15 29 1.70	2.7083	24 5 13.8	9.025
18	13 30 33.97	2.3292	14 24 3.5	14.855	18	15 31 44.41	2.7153	24 14 10.0	8.848
19	13 32 53.95	2.3369	14 38 52.7	14.783	19	15 34 27.54	2.7222	24 22 55.5	8.668
20	13 35 14.40	2.3447	14 53 37.5	14.710	20	15 37 11.07	2.7289	24 31 30.1	8.486
21	13 37 35.31	2.3524	15 8 17.9	14.634	21	15 39 55.01	2.7356	24 39 53.8	8.302
22	13 39 56.69	2.3603	15 22 53.6	14.556	22	15 42 39.34	2.7420	24 48 6.3	8.116
23	13 42 18.54	2.3681	S. 15 37 24.6	14.476	23	15 45 24.05	2.7483	S. 24 56 7.7	7.929
	WEDNESDAY 26.					FRIDAY 28.			
0	13 44 40.86	2.3760	S. 15 51 50.7	14.394	0	15 48 9.14	2.7546	S. 25 3 57.8	7.739
1	13 47 3.66	2.3841	16 6 11.9	14.310	1	15 50 54.60	2.7607	25 11 36.4	7.548
2	13 49 26.95	2.3922	16 20 27.9	14.223	2	15 53 40.42	2.7666	25 19 3.6	7.357
3	13 51 50.72	2.4002	16 34 38.6	14.133	3	15 56 26.59	2.7723	25 26 19.2	7.162
4	13 54 14.98	2.4084	16 48 43.9	14.042	4	15 59 13.09	2.7778	25 33 23.0	6.965
5	13 56 39.73	2.4167	17 2 43.6	13.948	5	16 1 59.92	2.7832	25 40 15.0	6.768
6	13 59 4.98	2.4249	17 16 37.7	13.853	6	16 4 47.07	2.7884	25 46 55.1	6.568
7	14 1 30.72	2.4331	17 30 25.9	13.754	7	16 7 34.53	2.7935	25 53 23.2	6.368
8	14 3 56.95	2.4413	17 44 8.2	13.653	8	16 10 22.29	2.7983	25 59 39.3	6.167
9	14 6 23.68	2.4497	17 57 44.3	13.550	9	16 13 10.33	2.8030	26 5 43.2	5.963
10	14 8 50.91	2.4580	18 11 14.2	13.445	10	16 15 58.65	2.8075	26 11 34.9	5.759
11	14 11 18.64	2.4664	18 24 37.7	13.338	11	16 18 47.23	2.8118	26 17 14.3	5.553
12	14 13 46.88	2.4748	18 37 54.7	13.228	12	16 21 36.06	2.8158	26 22 41.3	5.346
13	14 16 15.62	2.4832	18 51 5.0	13.115	13	16 24 25.13	2.8197	26 27 55.8	5.138
14	14 18 44.86	2.4916	19 4 8.5	13.001	14	16 27 14.42	2.8233	26 32 57.8	4.928
15	14 21 14.61	2.5001	19 17 5.1	12.883	15	16 30 3.93	2.8268	26 37 47.2	4.718
16	14 23 44.87	2.5085	19 29 54.5	12.763	16	16 32 53.64	2.8301	26 42 23.9	4.506
17	14 26 15.63	2.5168	19 42 36.7	12.642	17	16 35 43.54	2.8331	26 46 47.9	4.294
18	14 28 46.89	2.5253	19 55 11.5	12.518	18	16 38 33.61	2.8358	26 50 59.2	4.082
19	14 31 18.66	2.5338	20 7 38.8	12.392	19	16 41 23.84	2.8384	26 54 57.7	3.868
20	14 33 50.94	2.5422	20 19 58.5	12.263	20	16 44 14.22	2.8408	26 58 43.3	3.653
21	14 36 23.72	2.5506	20 32 10.3	12.131	21	16 47 4.74	2.8429	27 2 16.0	3.437
22	14 38 57.01	2.5589	20 44 14.2	11.998	22	16 49 55.37	2.8448	27 5 35.7	3.221
23	14 41 30.79	2.5673	20 56 10.0	11.861	23	16 52 46.11	2.8465	27 8 42.5	3.005
24	14 44 5.08	2.5757	S. 21 7 57.5	11.723	24	16 55 36.95	2.8479	S. 27 11 36.3	2.788

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 29.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	16 55 36.95	2.8479	S. 27 11 36.3	2.788
1	16 58 27.86	2.8491	27 14 17.0	2.570
2	17 1 18.84	2.8501	27 16 44.7	2.353
3	17 4 9.87	2.8508	27 18 59.3	2.134
4	17 7 0.93	2.8513	27 21 0.8	1.916
5	17 9 52.02	2.8515	27 22 49.2	1.697
6	17 12 43.11	2.8514	27 24 24.4	1.478
7	17 15 34.19	2.8512	27 25 46.6	1.261
8	17 18 25.25	2.8507	27 26 55.7	1.042
9	17 21 16.27	2.8499	27 27 51.6	0.823
10	17 24 7.24	2.8490	27 28 34.4	0.605
11	17 26 58.15	2.8478	27 29 4.2	0.388
12	17 29 48.97	2.8463	27 29 20.9	−0.169
13	17 32 39.70	2.8446	27 29 24.5	+0.049
14	17 35 30.32	2.8426	27 29 15.0	0.266
15	17 38 20.81	2.8404	27 28 52.6	0.482
16	17 41 11.17	2.8380	27 28 17.2	0.698
17	17 44 1.37	2.8353	27 27 28.9	0.913
18	17 46 51.41	2.8325	27 26 27.6	1.128
19	17 49 41.27	2.8294	27 25 13.5	1.342
20	17 52 30.94	2.8261	27 23 46.6	1.555
21	17 55 20.40	2.8225	27 22 6.9	1.768
22	17 58 9.64	2.8188	27 20 14.5	1.978
23	18 0 58.65	2.8148	S. 27 18 9.5	2.189

SUNDAY 30.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	18 3 47.41	2.8105	S. 27 15 51.8	2.399
1	18 6 35.91	2.8061	27 13 21.6	2.608
2	18 9 24.14	2.8014	27 10 38.9	2.814
3	18 12 12.08	2.7965	27 7 43.9	3.020
4	18 14 59.72	2.7915	27 4 36.5	3.226
5	18 17 47.06	2.7863	27 1 16.8	3.429
6	18 20 34.08	2.7808	26 57 45.0	3.631
7	18 23 20.76	2.7752	26 54 1.1	3.832
8	18 26 7.10	2.7694	26 50 5.2	4.032
9	18 28 53.09	2.7635	26 45 57.3	4.230
10	18 31 38.72	2.7573	26 41 37.6	4.426
11	18 34 23.97	2.7509	26 37 6.2	4.621
12	18 37 8.83	2.7443	26 32 23.1	4.814
13	18 39 53.29	2.7377	26 27 28.5	5.006
14	18 42 37.35	2.7308	26 22 22.4	5.197
15	18 45 20.99	2.7238	26 17 4.9	5.385
16	18 48 4.21	2.7167	26 11 36.2	5.572
17	18 50 46.99	2.7094	26 5 56.3	5.757
18	18 53 29.34	2.7020	26 0 5.4	5.940
19	18 56 11.23	2.6944	25 54 3.5	6.121
20	18 58 52.67	2.6868	25 47 50.9	6.299
21	19 1 33.65	2.6791	25 41 27.6	6.478
22	19 4 14.16	2.6711	25 34 53.6	6.654
23	19 6 54.18	2.6630	25 28 9.1	6.828
24	19 9 33.72	2.6548	S. 25 21 14.3	6.998

MONDAY 31.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	19 9 33.72	2.6548	S. 25 21 14.3	6.998
1	19 12 12.76	2.6466	25 14 9.3	7.168
2	19 14 51.31	2.6383	25 6 54.1	7.337
3	19 17 29.35	2.6298	24 59 28.9	7.502
4	19 20 6.88	2.6213	24 51 53.9	7.665
5	19 22 43.90	2.6126	24 44 9.1	7.827
6	19 25 20.39	2.6038	24 36 14.7	7.987
7	19 27 56.36	2.5952	24 28 10.7	8.144
8	19 30 31.81	2.5864	24 19 57.4	8.299
9	19 33 6.73	2.5775	24 11 34.8	8.453
10	19 35 41.11	2.5685	24 3 3.0	8.604
11	19 38 14.95	2.5595	23 54 22.3	8.753
12	19 40 48.25	2.5504	23 45 32.7	8.900
13	19 43 21.00	2.5413	23 36 34.3	9.045
14	19 45 53.20	2.5322	23 27 27.3	9.188
15	19 48 24.86	2.5230	23 18 11.8	9.328
16	19 50 55.96	2.5138	23 8 48.0	9.466
17	19 53 26.51	2.5046	22 59 15.9	9.603
18	19 55 56.51	2.4953	22 49 35.7	9.737
19	19 58 25.95	2.4860	22 39 47.5	9.868
20	20 0 54.83	2.4767	22 29 51.5	9.998
21	20 3 23.15	2.4674	22 19 47.7	10.127
22	20 5 50.92	2.4582	22 9 36.3	10.252
23	20 8 18.13	2.4488	S. 21 59 17.5	10.375

TUESDAY, JUNE 1.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	20 10 44.78	2.4395	S. 21 48 51.3	10.497

PHASES OF THE MOON.

			d	h	m
☾	Last Quarter	May	5	17	22.6
●	New Moon		13	15	31.0
☽	First Quarter		21	16	50.0
○	Full Moon		28	9	32.9

			d	h
☾	Apogee	May	14	9.4
☾	Perigee		28	5.6

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semidiameter.	Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Subtracted from / Added to Apparent Time.	Diff. for 1 Hour.
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Tues.	1	4 33 2.15	10.215	N.21 56 51.0	+21.18	15 48.07	68.33	2 30.56	0.357
Wed.	2	4 37 7.53	10.233	22 5 8.1	20.23	15 47.92	68.39	2 21.76	0.375
Thur.	3	4 41 13.33	10.250	22 13 2.1	19.27	15 47.78	68.44	2 12.55	0.392
Fri.	4	4 45 19.53	10.266	22 20 32.9	+18.30	15 47.64	68.50	2 2.93	0.408
Sat.	5	4 49 26.11	10.282	22 27 40.4	17.32	15 47.50	68.55	1 52.93	0.424
SUN.	6	4 53 33.06	10.297	22 34 24.3	16.33	15 47.37	68.60	1 42.57	0.439
Mon.	7	4 57 40.36	10.311	22 40 44.5	+15.34	15 47.25	68.64	1 31.85	0.453
Tues.	8	5 1 47.98	10.324	22 46 40.9	14.35	15 47.13	68.68	1 20.82	0.466
Wed.	9	5 5 55.91	10.336	22 52 13.2	13.35	15 47.02	68.72	1 9.48	0.478
Thur.	10	5 10 4.12	10.347	22 57 21.5	+12.34	15 46.91	68.76	0 57.87	0.489
Fri.	11	5 14 12.58	10.357	23 2 5.5	11.33	15 46.80	68.79	0 46.00	0.499
Sat.	12	5 18 21.27	10.366	23 6 25.1	10.31	15 46.70	68.82	0 33.90	0.508
SUN.	13	5 22 30.17	10.374	23 10 20.4	+ 9.29	15 46.61	68.84	0 21.59	0.516
Mon.	14	5 26 39.24	10.381	23 13 51.0	8.27	15 46.52	68.87	0 9.11	0.523
Tues.	15	5 30 48.47	10.387	23 16 57.1	7.24	15 46.43	68.89	0 3.53	0.529
Wed.	16	5 34 57.83	10.392	23 19 38.5	+ 6.21	15 46.35	68.91	0 16.29	0.534
Thur.	17	5 39 7.29	10.396	23 21 55.2	5.18	15 46.28	68.92	0 29.16	0.538
Fri.	18	5 43 16.82	10.398	23 23 47.1	4.15	15 46.21	68.93	0 42.09	0.540
Sat.	19	5 47 26.40	10.399	23 25 14.3	+ 3.12	15 46.15	68.94	0 55.08	0.541
SUN.	20	5 51 36.00	10.400	23 26 16.7	2.08	15 46.09	68.95	1 8.09	0.542
Mon.	21	5 55 45.61	10.399	23 26 54.3	1.05	15 46.04	68.95	1 21.10	0.541
Tues.	22	5 59 55.18	10.398	23 27 7.1	+ 0.02	15 45.99	68.95	1 34.08	0.539
Wed.	23	6 4 4.71	10.395	23 26 55.1	− 1.01	15 45.94	68.94	1 47.01	0.537
Thur.	24	6 8 14.16	10.392	23 26 18.4	2.04	15 45.90	68.93	1 59.87	0.534
Fri.	25	6 12 23.53	10.388	23 25 17.0	− 3.07	15 45.86	68.92	2 12.64	0.530
Sat.	26	6 16 32.78	10.383	23 23 50.9	4.10	15 45.82	68.91	2 25.31	0.525
SUN.	27	6 20 41.92	10.377	23 22 0.1	5.13	15 45.79	68.89	2 37.84	0.519
Mon.	28	6 24 50.90	10.371	23 19 44.7	− 6.15	15 45.76	68.87	2 50.24	0.513
Tues.	29	6 28 59.73	10.364	23 17 4.8	7.17	15 45.73	68.84	3 2.47	0.506
Wed.	30	6 33 8.37	10.356	23 14 0.4	8.19	15 45.71	68.81	3 14.53	0.498
Thur.	31	6 37 16.82	10.347	N.23 10 31.5	− 9.21	15 45.69	68.78	3 26.38	0.489

Note.—The mean time of semidiameter passing the meridian may be found by subtracting $0^s.19$ from the sidereal time.

The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Tues.	1	4 33 2.58	10.214	N. 21 56 51.9	+21.18	2 30.54	0.357	4 35 33.12
Wed.	2	4 37 7.93	10.232	22 5 8.9	20.22	2 21.75	0.375	4 39 29.68
Thur.	3	4 41 13.70	10.249	22 13 2.8	19.26	2 12.54	0.392	4 43 26.24
Fri.	4	4 45 19.88	10.265	22 20 33.6	+18.29	2 2.92	0.408	4 47 22.80
Sat.	5	4 49 26.44	10.281	22 27 40.9	17.31	1 52.92	0.424	4 51 19.35
SUN.	6	4 53 33.36	10.296	22 34 24.8	16.33	1 42.55	0.439	4 55 15.91
Mon.	7	4 57 40.63	10.310	22 40 44.9	+15.34	1 31.84	0.453	4 59 12.47
Tues.	8	5 1 48.22	10.323	22 46 41.2	14.35	1 20.81	0.466	5 3 9.03
Wed.	9	5 5 56.11	10.335	22 52 13.5	13.35	1 9.48	0.478	5 7 5.59
Thur.	10	5 10 4.28	10.346	22 57 21.7	+12.34	0 57.86	0.489	5 11 2.14
Fri.	11	5 14 12.71	10.356	23 2 5.6	11.33	0 45.99	0.499	5 14 58.70
Sat.	12	5 18 21.37	10.365	23 6 25.2	10.31	0 33.90	0.508	5 18 55.26
SUN.	13	5 22 30.23	10.373	23 10 20.4	+ 9.29	0 21.59	0.516	5 22 51.82
Mon.	14	5 26 39.27	10.380	23 13 51.0	8.26	0 9.11	0.523	5 26 48.38
Tues.	15	5 30 48.46	10.386	23 16 57.1	7.24	0 3.53	0.529	5 30 44.94
Wed.	16	5 34 57.78	10.390	23 19 38.5	+ 6.21	0 16.29	0.534	5 34 41.50
Thur.	17	5 39 7.20	10.394	23 21 55.2	5.18	0 29.15	0.538	5 38 38.05
Fri.	18	5 43 16.70	10.397	23 23 47.1	4.15	0 42.09	0.540	5 42 34.61
Sat.	19	5 47 26.24	10.398	23 25 14.3	+ 3.12	0 55.07	0.541	5 46 31.17
SUN.	20	5 51 35.81	10.399	23 26 16.7	2.08	1 8.08	0.542	5 50 27.73
Mon.	21	5 55 45.37	10.398	23 26 54.3	1.05	1 21.08	0.541	5 54 24.29
Tues.	22	5 59 54.91	10.396	23 27 7.1	+ 0.02	1 34.06	0.539	5 58 20.85
Wed.	23	6 4 4.40	10.394	23 26 55.2	− 1.01	1 46.99	0.537	6 2 17.40
Thur.	24	6 8 13.82	10.391	23 26 18.5	2.04	1 59.86	0.534	6 6 13.96
Fri.	25	6 12 23.14	10.387	23 25 17.1	− 3.07	2 12.62	0.530	6 10 10.52
Sat.	26	6 16 32.36	10.382	23 23 51.1	4.10	2 25.28	0.525	6 14 7.08
SUN.	27	6 20 41.46	10.376	23 22 0.4	5.13	2 37.82	0.519	6 18 3.64
Mon.	28	6 24 50.41	10.370	23 19 45.0	− 6.15	2 50.22	0.513	6 22 0.20
Tues.	29	6 28 59.20	10.363	23 17 5.2	7.17	3 2.45	0.506	6 25 56.76
Wed.	30	6 33 7.81	10.355	23 14 0.8	8.19	3 14.50	0.498	6 29 53.31
Thur.	31	6 37 16.23	10.346	N. 23 10 32.0	− 9.21	3 26.36	0.489	6 33 49.87

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

Diff. for 1 Hour, $+9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S							Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.		
		True Longitude.					Diff. for 1 Hour.	Latitude.					
		λ			λ′								
		°	′	″	′	″	″	″			h	m	s
1	152	69	54	46.5	54	15.8	143.68	−0.05	0.006 1103	+27.9	19	21	16.11
2	153	70	52	14.4	51	43.6	143.65	+0.07	0.006 1766	27.3	19	17	20.20
3	154	71	49	41.6	49	10.6	143.62	0.20	0.006 2414	26.7	19	13	24.29
4	155	72	47	8.1	46	36.9	143.59	+0.32	0.006 3045	+26.0	19	9	28.38
5	156	73	44	34.0	44	2.6	143.56	0.44	0.006 3659	25.2	19	5	32.46
6	157	74	41	59.2	41	27.6	143.54	0.54	0.006 4253	24.3	19	1	36.55
7	158	75	39	23.8	38	52.0	143.51	+0.62	0.006 4826	+23.4	18	57	40.64
8	159	76	36	47.7	36	15.8	143.48	0.68	0.006 5378	22.5	18	53	44.73
9	160	77	34	11.0	33	38.9	143.46	0.71	0.006 5908	21.6	18	49	48.81
10	161	78	31	33.7	31	1.4	143.43	+0.73	0.006 6415	+20.6	18	45	52.90
11	162	79	28	55.7	28	23.2	143.41	0.71	0.006 6898	19.6	18	41	56.99
12	163	80	26	17.0	25	44.3	143.38	0.65	0.006 7356	18.6	18	38	1.08
13	164	81	23	37.7	23	4.8	143.35	+0.58	0.006 7789	+17.6	18	34	5.16
14	165	82	20	57.6	20	24.6	143.32	0.49	0.006 8198	16.5	18	30	9.25
15	166	83	18	16.8	17	43.6	143.29	0.38	0.006 8583	15.5	18	26	13.34
16	167	84	15	35.3	15	1.8	143.25	+0.25	0.006 8943	+14.5	18	22	17.43
17	168	85	12	53.0	12	19.4	143.22	+0.11	0.006 9279	13.5	18	18	21.52
18	169	86	10	10.0	9	36.1	143.19	−0.02	0.006 9592	12.6	18	14	25.60
19	170	87	7	26.1	6	52.1	143.16	−0.15	0.006 9883	+11.7	18	10	29.69
20	171	88	4	41.5	4	7.3	143.13	0.25	0.007 0152	10.8	18	6	33.78
21	172	89	1	56.2	1	21.8	143.10	0.34	0.007 0401	10.0	18	2	37.86
22	173	89	59	10.1	58	35.5	143.07	−0.42	0.007 0631	+ 9.2	17	58	41.95
23	174	90	56	23.3	55	48.6	143.04	0.45	0.007 0844	8.5	17	54	46.04
24	175	91	53	36.0	53	1.0	143.02	0.44	0.007 1041	7.9	17	50	50.13
25	176	92	50	48.1	50	12.9	143.00	−0.40	0.007 1223	+ 7.3	17	46	54.21
26	177	93	47	59.7	47	24.4	142.98	0.34	0.007 1391	6.7	17	42	58.30
27	178	94	45	11.1	44	35.6	142.97	0.25	0.007 1545	6.1	17	39	2.39
28	179	95	42	22.2	41	46.5	142.96	−0.14	0.007 1686	+ 5.6	17	35	6.48
29	180	96	39	33.3	38	57.4	142.96	0.00	0.007 1812	5.0	17	31	10.56
30	181	97	36	44.3	36	8.2	142.96	+0.14	0.007 1924	4.3	17	27	14.65
31	182	98	33	55.4	33	19.2	142.97	+0.26	0.007 2019	+ 3.6	17	23	18.74

NOTE.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,
$-9^{s}.8296$.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	16 12.0	16 4.3	59 21.51	−2.307	58 53.30	−2.385	16 10.8	2.21	18.4
2	15 56.5	15 48.6	58 24.48	2.409	57 55.67	2.384	17 1.1	2.00	19.4
3	15 40.9	15 33.5	57 27.41	2.320	57 0.14	2.221	17 47.0	1.85	20.4
4	15 26.4	15 19.8	56 34.22	−2.095	56 9.95	−1.946	18 30.0	1.75	21.4
5	15 13.7	15 8.2	55 47.56	1.783	55 27.19	1.610	19 11.4	1.71	22.4
6	15 3.2	14 58.8	55 8.93	1.433	54 52.81	1.254	19 52.6	1.72	23.4
7	14 55.0	14 51.8	54 38.84	−1.076	54 26.98	−0.903	20 34.6	1.78	24.4
8	14 49.1	14 47.0	54 17.19	0.733	54 9.39	0.572	21 18.3	1.87	25.4
9	14 45.4	14 44.2	54 3.47	0.419	53 59.34	0.274	22 4.3	1.97	26.4
10	14 43.6	14 43.4	53 56.91	−0.136	53 56.08	−0.005	22 52.8	2.06	27.4
11	14 43.5	14 44.1	53 56.76	+0.117	53 58.86	+0.232	23 43.2	2.13	28.4
12	14 45.0	14 46.4	54 2.32	0.344	54 7.10	0.451	δ	. .	29.4
13	14 48.0	14 50.0	54 13.15	+0.556	54 20.45	+0.660	0 34.7	2.15	0.7
14	14 52.3	14 55.0	54 28.99	0.764	54 38.78	0.869	1 25.9	2.11	1.7
15	14 58.0	15 1.4	54 49.84	0.975	55 2.19	1.084	2 15.9	2.05	2.7
16	15 5.1	15 9.2	55 15.86	+1.195	55 30.88	+1.309	3 3.9	1.96	3.7
17	15 13.6	15 18.5	55 47.27	1.423	56 5.04	1.537	3 50.0	1.89	4.7
18	15 23.7	15 29.3	56 24.15	1.647	56 44.55	1.751	4 34.7	1.85	5.7
19	15 35.1	15 41.3	57 6.14	+1.844	57 28.76	+1.923	5 19.0	1.85	6.7
20	15 47.7	15 54.2	57 52.20	1.981	58 16.20	2.014	6 3.9	1.91	7.7
21	16 0.8	16 7.4	58 40.40	2.014	59 4.39	1.978	6 51.1	2.03	8.7
22	16 13.7	16 19.7	59 27.71	+1.901	59 49.82	+1.775	7 41.8	2.20	9.7
23	16 25.3	16 30.1	60 10.11	1.598	60 27.98	1.373	8 37.4	2.43	10.7
24	16 34.2	16 37.3	60 42.88	1.102	60 54.26	0.788	9 38.5	2.65	11.7
25	16 39.3	16 40.1	61 1.65	+0.438	61 4.68	+0.064	10 43.9	2.78	12.7
26	16 39.7	16 38.0	61 3.14	−0.320	60 57.01	−0.699	11 50.9	2.77	13.7
27	16 35.2	16 31.1	60 46.43	1.061	60 31.65	1.396	12 55.8	2.61	14.7
28	16 26.1	16 20.1	60 13.08	−1.691	59 51.26	−1.936	13 55.8	2.38	15.7
29	16 13.5	16 6.3	59 26.84	2.125	59 0.49	2.258	14 50.1	2.15	16.7
30	15 58.8	15 51.1	58 32.86	2.337	58 4.60	2.363	15 39.4	1.96	17.7
31	15 43.4	15 35.8	57 36.33	−2.341	57 8.59	−2.275	16 24.7	1.83	18.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 1.			
	h m s	s	° ′ ″	″
0	20 10 44.78	2.4395	S. 21 48 51.3	10.497
1	20 13 10.87	2.4302	21 38 17.9	10.616
2	20 15 36.40	2.4209	21 27 37.4	10.733
3	20 18 1.38	2.4117	21 16 49.9	10.848
4	20 20 25.80	2.4024	21 5 55.6	10.961
5	20 22 49.67	2.3933	20 54 54.6	11.072
6	20 25 12.99	2.3840	20 43 47.0	11.181
7	20 27 35.75	2.3748	20 32 32.9	11.288
8	20 29 57.96	2.3656	20 21 12.5	11.393
9	20 32 19.62	2.3565	20 9 45.8	11.496
10	20 34 40.74	2.3474	19 58 13.0	11.596
11	20 37 1.31	2.3383	19 46 34.3	11.694
12	20 39 21.34	2.3293	19 34 49.7	11.791
13	20 41 40.83	2.3204	19 22 59.4	11.886
14	20 43 59.79	2.3115	19 11 3.4	11.978
15	20 46 18.21	2.3026	18 59 2.0	12.068
16	20 48 36.10	2.2938	18 46 55.2	12.158
17	20 50 53.46	2.2850	18 34 43.1	12.245
18	20 53 10.30	2.2763	18 22 25.8	12.330
19	20 55 26.62	2.2677	18 10 3.5	12.413
20	20 57 42.42	2.2590	17 57 36.3	12.493
21	20 59 57.70	2.2504	17 45 4.3	12.573
22	21 2 12.47	2.2420	17 32 27.5	12.652
23	21 4 26.74	2.2337	S. 17 19 46.1	12.727
	WEDNESDAY 2.			
0	21 6 40.51	2.2253	S. 17 7 0.3	12.800
1	21 8 53.78	2.2170	16 54 10.1	12.873
2	21 11 6.55	2.2088	16 41 15.6	12.943
3	21 13 18.84	2.2008	16 28 17.0	13.011
4	21 15 30.64	2.1927	16 15 14.3	13.078
5	21 17 41.96	2.1847	16 2 7.6	13.143
6	21 19 52.80	2.1768	15 48 57.1	13.207
7	21 22 3.17	2.1690	15 35 42.8	13.268
8	21 24 13.08	2.1613	15 22 24.9	13.328
9	21 26 22.52	2.1536	15 9 3.4	13.388
10	21 28 31.51	2.1460	14 55 38.4	13.444
11	21 30 40.04	2.1385	14 42 10.1	13.498
12	21 32 48.13	2.1311	14 28 38.6	13.552
13	21 34 55.77	2.1238	14 15 3.9	13.604
14	21 37 2 98	2.1166	14 1 26.1	13.655
15	21 39 9.76	2.1094	13 47 45.3	13.704
16	21 41 16.11	2.1023	13 34 1.6	13.752
17	21 43 22.04	2.0953	13 20 15.1	13.798
18	21 45 27.55	2.0884	13 6 25.9	13.842
19	21 47 32.65	2.0816	12 52 34.1	13.885
20	21 49 37.34	2.0748	12 38 39.7	13.927
21	21 51 41.63	2.0683	12 24 42.9	13.967
22	21 53 45.53	2.0618	12 10 43.7	14.005
23	21 55 49.04	2.0553	11 56 42.3	14.043
24	21 57 52.16	2.0489	S. 11 42 38.6	14.079

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 3.			
	h m s	s	° ′ ″	″
0	21 57 52.16	2.0489	S. 11 42 38.6	14.079
1	21 59 54.91	2.0427	11 28 32.8	14.113
2	22 1 57.28	2.0364	11 14 25.0	14.146
3	22 3 59.28	2.0303	11 0 15.3	14.178
4	22 6 0.92	2.0244	10 46 3.6	14.209
5	22 8 2.21	2.0185	10 31 50.2	14.238
6	22 10 3.14	2.0127	10 17 35.1	14.266
7	22 12 3.73	2.0069	10 3 18.3	14.293
8	22 14 3.97	2.0013	9 48 59.9	14.318
9	22 16 3.88	1.9958	9 34 40.1	14.343
10	22 18 3.46	1.9903	9 20 18.8	14.366
11	22 20 2.72	1.9851	9 5 56.2	14.388
12	22 22 1.67	1.9798	8 51 32.3	14.408
13	22 24 0.30	1.9747	8 37 7.2	14.428
14	22 25 58.63	1.9696	8 22 41.0	14.446
15	22 27 56.65	1.9646	8 8 13.7	14.463
16	22 29 54.38	1.9598	7 53 45.5	14.478
17	22 31 51.82	1.9549	7 39 16.3	14.493
18	22 33 48.97	1.9503	7 24 46.3	14.508
19	22 35 45.85	1.9457	7 10 15.4	14.521
20	22 37 42.45	1.9411	6 55 43.8	14.533
21	22 39 38.78	1.9367	6 41 11.5	14.543
22	22 41 34.85	1.9324	6 26 38.7	14.552
23	22 43 30.67	1.9283	S. 6 12 5.3	14.561
	FRIDAY 4.			
0	22 45 26.24	1.9241	S. 5 57 31.4	14.568
1	22 47 21.56	1.9200	5 42 57.1	14.575
2	22 49 16.64	1.9161	5 28 22.4	14.580
3	22 51 11.49	1.9123	5 13 47.5	14.584
4	22 53 6.11	1.9084	4 59 12.3	14.588
5	22 55 0.50	1.9048	4 44 36.9	14.591
6	22 56 54.68	1.9012	4 30 1.4	14.593
7	22 58 48.64	1.8977	4 15 25.8	14.593
8	23 0 42.40	1.8943	4 0 50.3	14.592
9	23 2 35.96	1.8910	3 46 14.8	14.591
10	23 4 29.32	1.8878	3 31 39.4	14.589
11	23 6 22.49	1.8846	3 17 4.1	14.586
12	23 8 15.47	1.8815	3 2 29.1	14.582
13	23 10 8.27	1.8786	2 47 54.3	14.577
14	23 12 0.90	1.8758	2 33 19.9	14.571
15	23 13 53.36	1.8729	2 18 45.8	14.565
16	23 15 45.65	1.8703	2 4 12.1	14.558
17	23 17 37.79	1.8677	1 49 38.9	14.549
18	23 19 29.77	1.8651	1 35 6.2	14.540
19	23 21 21.60	1.8627	1 20 34.1	14.529
20	23 23 13.29	1.8603	1 6 2.7	14.518
21	23 25 4.84	1.8581	0 51 31.9	14.508
22	23 26 56.26	1.8559	0 37 1.8	14.495
23	23 28 47.55	1.8538	0 22 32.5	14.481
24	23 30 38.72	1.8518	S. 0 8 4.1	14.467

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 5.					MONDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	23 30 38.72	1.8518	S. 0 8 4.1	14.467	0	0 58 44.84	1.8478	N. 10 55 44.9	12.917
1	23 32 29.77	1.8499	N. 0 6 23.5	14.452	1	1 0 35.76	1.8494	11 8 38.4	12.867
2	23 34 20.71	1.8482	0 20 50.1	14.436	2	1 2 26.77	1.8511	11 21 28.9	12.817
3	23 36 11.55	1.8464	0 35 15.8	14.420	3	1 4 17.89	1.8529	11 34 16.4	12.766
4	23 38 2.28	1.8447	0 49 40.5	14.403	4	1 6 9.12	1.8547	11 47 0.8	12.714
5	23 39 52.91	1.8431	1 4 4.1	14.384	5	1 8 0.45	1.8565	11 59 42.1	12.662
6	23 41 43.45	1.8416	1 18 26.6	14.365	6	1 9 51.90	1.8586	12 12 20.2	12.608
7	23 43 33.90	1.8402	1 32 47.9	14.345	7	1 11 43.48	1.8607	12 24 55.0	12.553
8	23 45 24.27	1.8388	1 47 8.0	14.325	8	1 13 35.18	1.8627	12 37 26.6	12.500
9	23 47 14.56	1.8376	2 1 26.9	14.304	9	1 15 27.00	1.8648	12 49 55.0	12.445
10	23 49 4.78	1.8364	2 15 44.5	14.283	10	1 17 18.95	1.8669	13 2 20.0	12.388
11	23 50 54.93	1.8353	2 30 0.8	14.259	11	1 19 11.03	1.8692	13 14 41.6	12.332
12	23 52 45.02	1.8343	2 44 15.6	14.235	12	1 21 3.25	1.8715	13 26 59.8	12.274
13	23 54 35.05	1.8334	2 58 29.0	14.212	13	1 22 55.61	1.8738	13 39 14.5	12.216
14	23 56 25.03	1.8326	3 12 41.0	14.188	14	1 24 48.11	1.8762	13 51 25.7	12.158
15	23 58 14.96	1.8318	3 26 51.5	14.162	15	1 26 40.75	1.8787	14 3 33.4	12.098
16	0 0 4.84	1.8311	3 41 0.4	14.135	16	1 28 33.55	1.8813	14 15 37.4	12.037
17	0 1 54.69	1.8305	3 55 7.7	14.108	17	1 30 26.50	1.8838	14 27 37.8	11.976
18	0 3 44.50	1.8299	4 9 13.3	14.079	18	1 32 19.60	1.8864	14 39 34.5	11.914
19	0 5 34.28	1.8294	4 23 17.2	14.051	19	1 34 12.87	1.8891	14 51 27.5	11.852
20	0 7 24.03	1.8290	4 37 19.4	14.023	20	1 36 6.29	1.8918	15 3 16.7	11.788
21	0 9 13.76	1.8288	4 51 19.9	13.993	21	1 37 59.88	1.8946	15 15 2.1	11.724
22	0 11 3.48	1.8285	5 5 18.5	13.962	22	1 39 53.64	1.8973	15 26 43.6	11.658
23	0 12 53.18	1.8283	N. 5 19 15.3	13.930	23	1 41 47.56	1.9002	N. 15 38 21.1	11.593
	SUNDAY 6.					TUESDAY 8.			
0	0 14 42.88	1.8283	N. 5 33 10.1	13.898	0	1 43 41.66	1.9032	N. 15 49 54.7	11.527
1	0 16 32.57	1.8283	5 47 3.0	13.865	1	1 45 35.94	1.9061	16 1 24.3	11.460
2	0 18 22.27	1.8283	6 0 53.9	13.831	2	1 47 30.39	1.9090	16 12 49.9	11.393
3	0 20 11.97	1.8285	6 14 42.7	13.797	3	1 49 25.02	1.9121	16 24 11.4	11.323
4	0 22 1.69	1.8288	6 28 29.5	13.763	4	1 51 19.84	1.9153	16 35 28.7	11.254
5	0 23 51.42	1.8290	6 42 14.2	13.727	5	1 53 14.85	1.9183	16 46 41.9	11.184
6	0 25 41.17	1.8293	6 55 56.7	13.690	6	1 55 10.04	1.9215	16 57 50.8	11.113
7	0 27 30.94	1.8298	7 9 37.0	13.653	7	1 57 5.43	1.9248	17 8 55.5	11.042
8	0 29 20.74	1.8303	7 23 15.1	13.616	8	1 59 1.01	1.9279	17 19 55.8	10.969
9	0 31 10.58	1.8309	7 36 50.9	13.577	9	2 0 56.78	1.9313	17 30 51.8	10.897
10	0 33 0.45	1.8315	7 50 24.3	13.538	10	2 2 52.76	1.9347	17 41 43.4	10.823
11	0 34 50.36	1.8323	8 3 55.4	13.498	11	2 4 48.94	1.9380	17 52 30.5	10.748
12	0 36 40.32	1.8331	8 17 24.1	13.458	12	2 6 45.32	1.9414	18 3 13.1	10.673
13	0 38 30.33	1.8339	8 30 50.3	13.416	13	2 8 41.91	1.9448	18 13 51.2	10.597
14	0 40 20.39	1.8348	8 44 14.0	13.374	14	2 10 38.70	1.9483	18 24 24.7	10.519
15	0 42 10.51	1.8358	8 57 35.2	13.332	15	2 12 35.70	1.9518	18 34 53.5	10.441
16	0 44 0.69	1.8369	9 10 53.8	13.288	16	2 14 32.91	1.9553	18 45 17.6	10.363
17	0 45 50.94	1.8381	9 24 9.8	13.244	17	2 16 30.33	1.9588	18 55 37.1	10.284
18	0 47 41.26	1.8393	9 37 23.1	13.200	18	2 18 27.97	1.9625	19 5 51.7	10.203
19	0 49 31.65	1.8405	9 50 33.8	13.155	19	2 20 25.83	1.9661	19 16 1.5	10.123
20	0 51 22.12	1.8418	10 3 41.7	13.108	20	2 22 23.90	1.9697	19 26 6.5	10.042
21	0 53 12.67	1.8432	10 16 46.8	13.061	21	2 24 22.19	1.9734	19 36 6.5	9.959
22	0 55 3.30	1.8446	10 29 49.0	13.013	22	2 26 20.71	1.9772	19 46 1.6	9.876
23	0 56 54.02	1.8462	10 42 48.4	12.966	23	2 28 19.45	1.9808	19 55 51.6	9.792
24	0 58 44.84	1.8478	N. 10 55 44.9	12.917	24	2 30 18.41	1.9846	N. 20 5 36.6	9.708

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 9.					FRIDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 30 18.41	1.9846	N. 20 5 36.6	9.708	0	4 9 59.43	2.1643	N. 25 59 4.8	4.735
1	2 32 17.60	1.9883	20 15 16.5	9.622	1	4 12 9.38	2.1673	26 3 45.3	4.614
2	2 34 17.01	1.9922	20 24 51.2	9.535	2	4 14 19.51	2.1703	26 8 18.5	4.493
3	2 36 16.66	1.9960	20 34 20.7	9.448	3	4 16 29.82	2.1733	26 12 44.4	4.370
4	2 38 16.53	1.9998	20 43 44.9	9.360	4	4 18 40.31	2.1763	26 17 2.9	4.248
5	2 40 16.63	2.0036	20 53 3.9	9.272	5	4 20 50.98	2.1793	26 21 14.1	4.124
6	2 42 16.96	2.0074	21 2 17.5	9.182	6	4 23 1.83	2.1822	26 25 17.8	4.000
7	2 44 17.52	2.0113	21 11 25.7	9.091	7	4 25 12.84	2.1849	26 29 14.1	3.877
8	2 46 18.32	2.0153	21 20 28.4	9.000	8	4 27 24.02	2.1877	26 33 3.0	3.752
9	2 48 19.35	2.0191	21 29 25.7	8.908	9	4 29 35.36	2.1904	26 36 44.3	3.626
10	2 50 20.61	2.0230	21 38 17.4	8.815	10	4 31 46.87	2.1931	26 40 18.1	3.500
11	2 52 22.11	2.0269	21 47 3.5	8.722	11	4 33 58.53	2.1956	26 43 44.3	3.374
12	2 54 23.84	2.0308	21 55 44.0	8.628	12	4 36 10.34	2.1981	26 47 3.0	3.248
13	2 56 25.81	2.0348	22 4 18.8	8.533	13	4 38 22.30	2.2006	26 50 14.0	3.120
14	2 58 28.01	2.0387	22 12 47.9	8.437	14	4 40 34.41	2.2029	26 53 17.4	2.993
15	3 0 30.45	2.0427	22 21 11.2	8.340	15	4 42 46.65	2.2052	26 56 13.1	2.864
16	3 2 33.13	2.0466	22 29 28.7	8.243	16	4 44 59.03	2.2075	26 59 1.1	2.736
17	3 4 36.04	2.0505	22 37 40.4	8.145	17	4 47 11.55	2.2097	27 1 41.4	2.607
18	3 6 39.19	2.0544	22 45 46.1	8.046	18	4 49 24.19	2.2117	27 4 13.9	2.477
19	3 8 42.57	2.0583	22 53 45.9	7.947	19	4 51 36.95	2.2138	27 6 38.6	2.347
20	3 10 46.19	2.0623	23 1 39.7	7.846	20	4 53 49.84	2.2158	27 8 55.5	2.217
21	3 12 50.05	2.0663	23 9 27.4	7.744	21	4 56 2.85	2.2177	27 11 4.6	2.087
22	3 14 54.14	2.0701	23 17 9.0	7.642	22	4 58 15.96	2.2194	27 13 5.9	1.956
23	3 16 58.46	2.0740	N. 23 24 44.4	7.539	23	5 0 29.18	2.2212	N. 27 14 59.3	1.824
	THURSDAY 10.					SATURDAY 12.			
0	3 19 3.02	2.0779	N. 23 32 13.7	7.436	0	5 2 42.50	2.2228	N. 27 16 44.8	1.693
1	3 21 7.81	2.0818	23 39 36.7	7.332	1	5 4 55.92	2.2244	27 18 22.4	1.561
2	3 23 12.83	2.0857	23 46 53.5	7.228	2	5 7 9.43	2.2259	27 19 52.1	1.428
3	3 25 18.09	2.0896	23 54 4.0	7.122	3	5 9 23.03	2.2273	27 21 13.8	1.296
4	3 27 23.58	2.0934	24 1 8.1	7.014	4	5 11 36.71	2.2287	27 22 27.6	1.163
5	3 29 29.30	2.0972	24 8 5.7	6.907	5	5 13 50.47	2.2300	27 23 33.4	1.031
6	3 31 35.24	2.1009	24 14 56.9	6.799	6	5 16 4.31	2.2312	27 24 31.3	0.898
7	3 33 41.41	2.1048	24 21 41.6	6.690	7	5 18 18.21	2.2323	27 25 21.1	0.764
8	3 35 47.81	2.1085	24 28 19.7	6.581	8	5 20 32.18	2.2333	27 26 3.0	0.631
9	3 37 54.43	2.1122	24 34 51.3	6.471	9	5 22 46.21	2.2343	27 26 36.8	0.497
10	3 40 1.27	2.1159	24 41 16.2	6.359	10	5 25 0.30	2.2352	27 27 2.6	0.363
11	3 42 8.34	2.1196	24 47 34.4	6.248	11	5 27 14.43	2.2359	27 27 20.3	0.228
12	3 44 15.62	2.1233	24 53 45.9	6.135	12	5 29 28.61	2.2367	27 27 30.0	+0.094
13	3 46 23.13	2.1269	24 59 50.6	6.023	13	5 31 42.83	2.2373	27 27 31.6	−0.041
14	3 48 30.85	2.1304	25 5 48.6	5.909	14	5 33 57.08	2.2378	27 27 25.1	0.175
15	3 50 38.78	2.1339	25 11 39.7	5.794	15	5 36 11.37	2.2383	27 27 10.6	0.309
16	3 52 46.92	2.1375	25 17 23.9	5.678	16	5 38 25.68	2.2387	27 26 48.0	0.444
17	3 54 55.28	2.1410	25 23 1.1	5.563	17	5 40 40.01	2.2390	27 26 17.3	0.578
18	3 57 3.84	2.1444	25 28 31.4	5.447	18	5 42 54.36	2.2393	27 25 38.6	0.713
19	3 59 12.61	2.1478	25 33 54.7	5.330	19	5 45 8.72	2.2394	27 24 51.7	0.848
20	4 1 21.58	2.1512	25 39 11.0	5.213	20	5 47 23.09	2.2395	27 23 56.8	0.983
21	4 3 30.75	2.1544	25 44 20.2	5.093	21	5 49 37.46	2.2394	27 22 53.8	1.118
22	4 5 40.11	2.1577	25 49 22.2	4.974	22	5 51 51.82	2.2393	27 21 42.7	1.253
23	4 7 49.67	2.1610	25 54 17.1	4.855	23	5 54 6.17	2.2391	27 20 23.5	1.388
24	4 9 59.43	2.1643	N. 25 59 4.8	4.735	24	5 56 20.51	2.2388	N. 27 18 56.2	1.523

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 13.					TUESDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	5 56 20.51	2.2388	N. 27 18 56.2	1.523	0	7 42 8.09	2.1468	N. 23 35 29.2	7.628
1	5 58 34.83	2.2385	27 17 20.8	1.657	1	7 44 16.81	2.1438	23 27 48.1	7.743
2	6 0 49.13	2.2381	27 15 37.4	1.791	2	7 46 25.35	2.1408	23 20 0.1	7.857
3	6 3 3.40	2.2375	27 13 45.9	1.925	3	7 48 33.70	2.1376	23 12 5.3	7.970
4	6 5 17.63	2.2369	27 11 46.4	2.059	4	7 50 41.86	2.1345	23 4 3.7	8.083
5	6 7 31.83	2.2363	27 9 38.8	2.194	5	7 52 49.84	2.1314	22 55 55.4	8.194
6	6 9 45.99	2.2356	27 7 23.1	2.328	6	7 54 57.63	2.1283	22 47 40.4	8.305
7	6 12 0.10	2.2348	27 4 59.4	2.462	7	7 57 5.23	2.1251	22 39 18.8	8.416
8	6 14 14.16	2.2338	27 2 27.7	2.595	8	7 59 12.64	2.1219	22 30 50.5	8.526
9	6 16 28.16	2.2328	26 59 48.0	2.728	9	8 1 19.86	2.1188	22 22 15.7	8.634
10	6 18 42.10	2.2318	26 57 0.3	2.862	10	8 3 26.89	2.1156	22 13 34.4	8.743
11	6 20 55.97	2.2306	26 54 4.6	2.994	11	8 5 33.73	2.1123	22 4 46.6	8.850
12	6 23 9.77	2.2294	26 51 1.0	3.127	12	8 7 40.37	2.1091	21 55 52.4	8.957
13	6 25 23.50	2.2282	26 47 49.4	3.260	13	8 9 46.82	2.1059	21 46 51.8	9.063
14	6 27 37.15	2.2268	26 44 29.8	3.393	14	8 11 53.08	2.1028	21 37 44.9	9.168
15	6 29 50.72	2.2254	26 41 2.3	3.524	15	8 13 59.15	2.0995	21 28 31.7	9.273
16	6 32 4.20	2.2239	26 37 26.9	3.656	16	8 16 5.02	2.0963	21 19 12.2	9.376
17	6 34 17.59	2.2224	26 33 43.6	3.787	17	8 18 10.70	2.0931	21 9 46.6	9.478
18	6 36 30.89	2.2208	26 29 52.5	3.918	18	8 20 16.19	2.0898	21 0 14.8	9.581
19	6 38 44.09	2.2191	26 25 53.5	4.048	19	8 22 21.48	2.0866	20 50 36.9	9.683
20	6 40 57.18	2.2173	26 21 46.7	4.178	20	8 24 26.58	2.0834	20 40 52.9	9.783
21	6 43 10.17	2.2155	26 17 32.1	4.308	21	8 26 31.49	2.0802	20 31 2.9	9.883
22	6 45 23.04	2.2136	26 13 9.7	4.438	22	8 28 36.20	2.0770	20 21 7.0	9.982
23	6 47 35.80	2.2117	N. 26 8 39.6	4.567	23	8 30 40.73	2.0739	N. 20 11 5.1	10.080
	MONDAY 14.					WEDNESDAY 16.			
0	6 49 48.44	2.2097	N. 26 4 1.7	4.696	0	8 32 45.07	2.0708	N. 20 0 57.4	10.178
1	6 52 0.96	2.2076	25 59 16.1	4.824	1	8 34 49.22	2.0676	19 50 43.8	10.274
2	6 54 13.35	2.2054	25 54 22.8	4.952	2	8 36 53.18	2.0645	19 40 24.5	10.370
3	6 56 25.61	2.2033	25 49 21.9	5.079	3	8 38 56.96	2.0614	19 29 59.4	10.465
4	6 58 37.74	2.2011	25 44 13.3	5.207	4	8 41 0.55	2.0583	19 19 28.7	10.559
5	7 0 49.74	2.1988	25 38 57.1	5.333	5	8 43 3.95	2.0552	19 8 52.3	10.653
6	7 3 1.60	2.1964	25 33 33.4	5.458	6	8 45 7.17	2.0522	18 58 10.4	10.745
7	7 5 13.31	2.1940	25 28 2.1	5.583	7	8 47 10.21	2.0492	18 47 22.9	10.838
8	7 7 24.88	2.1916	25 22 23.4	5.708	8	8 49 13.07	2.0462	18 36 29.9	10.928
9	7 9 36.30	2.1891	25 16 37.1	5.833	9	8 51 15.75	2.0432	18 25 31.5	11.018
10	7 11 47.57	2.1866	25 10 43.4	5.957	10	8 53 18.25	2.0403	18 14 27.7	11.108
11	7 13 58.69	2.1840	25 4 42.3	6.080	11	8 55 20.58	2.0373	18 3 18.6	11.196
12	7 16 9.65	2.1813	24 58 33.8	6.203	12	8 57 22.73	2.0344	17 52 4.2	11.284
13	7 18 20.45	2.1787	24 52 18.0	6.325	13	8 59 24.71	2.0316	17 40 44.5	11.371
14	7 20 31.09	2.1759	24 45 54.8	6.447	14	9 1 26.52	2.0288	17 29 19.7	11.456
15	7 22 41.56	2.1732	24 39 24.4	6.568	15	9 3 28.16	2.0259	17 17 49.8	11.542
16	7 24 51.87	2.1704	24 32 46.7	6.688	16	9 5 29.63	2.0232	17 6 14.7	11.627
17	7 27 2.01	2.1676	24 26 1.8	6.808	17	9 7 30.94	2.0205	16 54 34.6	11.710
18	7 29 11.98	2.1647	24 19 9.8	6.927	18	9 9 32.09	2.0178	16 42 49.5	11.793
19	7 31 21.77	2.1618	24 12 10.6	7.045	19	9 11 33.07	2.0151	16 30 59.5	11.875
20	7 33 31.39	2.1588	24 5 4.4	7.163	20	9 13 33.90	2.0125	16 19 4.5	11.957
21	7 35 40.83	2.1559	23 57 51.1	7.280	21	9 15 34.57	2.0099	16 7 4.7	12.036
22	7 37 50.10	2.1530	23 50 30.8	7.397	22	9 17 35.09	2.0074	15 55 0.2	12.115
23	7 39 59.19	2.1499	23 43 3.5	7.513	23	9 19 35.46	2.0049	15 42 50.9	12.194
24	7 42 8.09	2.1468	N. 23 35 29.2	7.628	24	9 21 35.68	2.0025	N. 15 30 36.9	12.272

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min
	THURSDAY 17.					SATURDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 21 35.68	2.0025	N. 15 30 36.9	12.272	0	10 55 56.67	1.9540	N. 4 28 14.5	14.9
1	9 23 35.76	2.0001	15 18 18.3	12.348	1	10 57 53.93	1.9548	4 13 14.0	15.0
2	9 25 35.69	1.9977	15 5 55.1	12.425	2	10 59 51.24	1.9556	3 58 11.5	15.0
3	9 27 35.48	1.9953	14 53 27.3	12.500	3	11 1 48.60	1.9565	3 43 7.0	15.0
4	9 29 35.13	1.9931	14 40 55.1	12.574	4	11 3 46.02	1.9575	3 28 0.5	15.1
5	9 31 34.65	1.9909	14 28 18.4	12.648	5	11 5 43.50	1.9585	3 12 52.2	15.1
6	9 33 34.04	1.9888	14 15 37.3	12.721	6	11 7 41.04	1.9597	2 57 42.0	15.1
7	9 35 33.30	1.9866	14 2 51.9	12.793	7	11 9 38.66	1.9609	2 42 30.1	15.2
8	9 37 32.43	1.9845	13 50 2.2	12.863	8	11 11 36.35	1.9623	2 27 16.5	15.2
9	9 39 31.44	1.9825	13 37 8.3	12.933	9	11 13 34.13	1.9637	2 12 1.2	15.2
10	9 41 30.33	1.9806	13 24 10.2	13.002	10	11 15 31.99	1.9652	1 56 44.4	15.2
11	9 43 29.11	1.9787	13 11 8.0	13.071	11	11 17 29.95	1.9668	1 41 26.1	15.3
12	9 45 27.77	1.9768	12 58 1.7	13.138	12	11 19 28.00	1.9684	1 26 6.3	15.3
13	9 47 26.32	1.9750	12 44 51.4	13.205	13	11 21 26.16	1.9702	1 10 45.1	15.3
14	9 49 24.77	1.9733	12 31 37.1	13.272	14	11 23 24.42	1.9720	0 55 22.6	15.3
15	9 51 23.12	1.9717	12 18 18.8	13.337	15	11 25 22.80	1.9740	0 39 58.8	15.4
16	9 53 21.37	1.9700	12 4 56.7	13.401	16	11 27 21.30	1.9760	0 24 33.8	15.4
17	9 55 19.52	1.9684	11 51 30.7	13.464	17	11 29 19.92	1.9781	N. 0 9 7.7	15.4
18	9 57 17.58	1.9669	11 38 1.0	13.527	18	11 31 18.67	1.9803	S. 0 6 19.5	15.4
19	9 59 15.55	1.9655	11 24 27.5	13.588	19	11 33 17.55	1.9825	0 21 47.7	15.4
20	10 1 13.44	1.9642	11 10 50.4	13.648	20	11 35 16.57	1.9849	0 37 16.9	15.4
21	10 3 11.25	1.9629	10 57 9.7	13.708	21	11 37 15.74	1.9874	0 52 46.9	15.5
22	10 5 8.99	1.9617	10 43 25.4	13.768	22	11 39 15.06	1.9900	1 8 17.7	15.5
23	10 7 6.65	1.9604	N. 10 29 37.6	13.826	23	11 41 14.54	1.9927	S. 1 23 49.3	15.5
	FRIDAY 18.					SUNDAY 20.			
0	10 9 4.24	1.9593	N. 10 15 46.3	13.883	0	11 43 14.18	1.9954	S. 1 39 21.6	15.5
1	10 11 1.77	1.9583	10 1 51.6	13.940	1	11 45 13.99	1.9983	1 54 54.5	15.5
2	10 12 59.23	1.9573	9 47 53.5	13.995	2	11 47 13.97	2.0012	2 10 27.9	15.5
3	10 14 56.64	1.9564	9 33 52.2	14.049	3	11 49 14.13	2.0043	2 26 1.8	15.5
4	10 16 54.00	1.9556	9 19 47.6	14.103	4	11 51 14.48	2.0073	2 41 36.1	15.5
5	10 18 51.31	1.9548	9 5 39.8	14.157	5	11 53 15.01	2.0105	2 57 10.7	15.5
6	10 20 48.57	1.9541	8 51 28.8	14.208	6	11 55 15.74	2.0138	3 12 45.6	15.5
7	10 22 45.80	1.9534	8 37 14.8	14.259	7	11 57 16.67	2.0173	3 28 20.7	15.5
8	10 24 42.98	1.9528	8 22 57.7	14.310	8	11 59 17.81	2.0208	3 43 55.9	15.5
9	10 26 40.14	1.9524	8 8 37.6	14.359	9	12 1 19.16	2.0243	3 59 31.1	15.5
10	10 28 37.27	1.9519	7 54 14.6	14.408	10	12 3 20.72	2.0279	4 15 6.3	15.58
11	10 30 34.37	1.9516	7 39 48.7	14.456	11	12 5 22.51	2.0318	4 30 41.3	15.583
12	10 32 31.46	1.9513	7 25 19.9	14.503	12	12 7 24.53	2.0356	4 46 16.2	15.579
13	10 34 28.53	1.9511	7 10 48.4	14.548	13	12 9 26.78	2.0395	5 1 50.8	15.574
14	10 36 25.59	1.9510	6 56 14.2	14.593	14	12 11 29.27	2.0436	5 17 25.1	15.568
15	10 38 22.65	1.9509	6 41 37.3	14.637	15	12 13 32.01	2.0478	5 32 59.0	15.561
16	10 40 19.70	1.9509	6 26 57.8	14.679	16	12 15 35.00	2.0520	5 48 32.4	15.552
17	10 42 16.76	1.9511	6 12 15.8	14.722	17	12 17 38.25	2.0563	6 4 5.2	15.541
18	10 44 13.83	1.9513	5 57 31.2	14.763	18	12 19 41.76	2.0608	6 19 37.3	15.529
19	10 46 10.91	1.9515	5 42 44.2	14.803	19	12 21 45.54	2.0653	6 35 8.7	15.517
20	10 48 8.01	1.9518	5 27 54.8	14.843	20	12 23 49.59	2.0699	6 50 39.3	15.503
21	10 50 5.13	1.9522	5 13 3.1	14.881	21	12 25 53.93	2.0747	7 6 9.0	15.487
22	10 52 2.27	1.9527	4 58 9.1	14.918	22	12 27 58.55	2.0794	7 21 37.7	15.469
23	10 53 59.45	1.9533	4 43 12.9	14.955	23	12 30 3.46	2.0843	7 37 5.3	15.450
24	10 55 56.67	1.9540	N. 4 28 14.5	14.991	24	12 32 8.67	2.0893	S. 7 52 31.7	15.430

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 21.					WEDNESDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	12 32 8.67	2.0893	S. 7 52 31.7	15.430	0	14 19 51.17	2.4269	S. 19 19 0.4	12.468
1	12 34 14.18	2.0944	8 7 56.9	15.409	1	14 22 17.04	2.4354	19 31 25.2	12.358
2	12 36 20.00	2.0997	8 23 20.8	15.387	2	14 24 43.42	2.4440	19 43 43.3	12.245
3	12 38 26.14	2.1049	8 38 43.3	15.363	3	14 27 10.32	2.4526	19 55 54.6	12.131
4	12 40 32.59	2.1103	8 54 4.3	15.336	4	14 29 37.73	2.4611	20 7 59.0	12.015
5	12 42 39.37	2.1158	9 9 23.6	15.308	5	14 32 5.65	2.4697	20 19 56.4	11.897
6	12 44 46.48	2.1213	9 24 41.3	15.280	6	14 34 34.09	2.4783	20 31 46.6	11.776
7	12 46 53.92	2.1269	9 39 57.2	15.249	7	14 37 3.04	2.4868	20 43 29.5	11.653
8	12 49 1.71	2.1328	9 55 11.2	15.217	8	14 39 32.50	2.4953	20 55 5.0	11.528
9	12 51 9.85	2.1386	10 10 23.2	15.183	9	14 42 2.48	2.5039	21 6 32.9	11.401
10	12 53 18.34	2.1445	10 25 33.2	15.148	10	14 44 32.97	2.5125	21 17 53.1	11.271
11	12 55 27.19	2.1505	10 40 41.0	15.111	11	14 47 3.98	2.5211	21 29 5.4	11.139
12	12 57 36.40	2.1566	10 55 46.5	15.073	12	14 49 35.50	2.5296	21 40 9.8	11.006
13	12 59 45.98	2.1628	11 10 49.7	15.033	13	14 52 7.53	2.5382	21 51 6.1	10.870
14	13 1 55.94	2.1691	11 25 50.4	14.991	14	14 54 40.08	2.5467	22 1 54.2	10.732
15	13 4 6.27	2.1754	11 40 48.6	14.948	15	14 57 13.13	2.5551	22 12 33.9	10.592
16	13 6 16.99	2.1819	11 55 44.1	14.903	16	14 59 46.69	2.5636	22 23 5.2	10.449
17	13 8 28.10	2.1884	12 10 36.9	14.856	17	15 2 20.76	2.5720	22 33 27.8	10.304
18	13 10 39.60	2.1951	12 25 26.8	14.807	18	15 4 55.33	2.5803	22 43 41.7	10.158
19	13 12 51.51	2.2018	12 40 13.7	14.756	19	15 7 30.39	2.5885	22 53 46.7	10.008
20	13 15 3.82	2.2086	12 54 57.5	14.704	20	15 10 5.95	2.5968	23 3 42.7	9.858
21	13 17 16.54	2.2155	13 9 38.2	14.651	21	15 12 42.01	2.6051	23 13 29.6	9.704
22	13 19 29.68	2.2225	13 24 15.6	14.595	22	15 15 18.56	2.6132	23 23 7.2	9.549
23	13 21 43.24	2.2296	S. 13 38 49.6	14.537	23	15 17 55.59	2.6212	S. 23 32 35.5	9.392
	TUESDAY 22.					THURSDAY 24.			
0	13 23 57.23	2.2366	S. 13 53 20.0	14.478	0	15 20 33.10	2.6292	S. 23 41 54.2	9.232
1	13 26 11.64	2.2438	14 7 46.9	14.417	1	15 23 11.09	2.6372	23 51 3.3	9.070
2	13 28 26.49	2.2512	14 22 10.0	14.353	2	15 25 49.56	2.6451	24 0 2.6	8.907
3	13 30 41.78	2.2585	14 36 29.3	14.289	3	15 28 28.50	2.6528	24 8 52.1	8.742
4	13 32 57.51	2.2659	14 50 44.7	14.223	4	15 31 7.90	2.6604	24 17 31.6	8.573
5	13 35 13.69	2.2734	15 4 56.0	14.153	5	15 33 47.75	2.6680	24 26 0.9	8.403
6	13 37 30.32	2.2810	15 19 3.1	14.083	6	15 36 28.06	2.6755	24 34 20.0	8.233
7	13 39 47.41	2.2887	15 33 5.9	14.011	7	15 39 8.81	2.6828	24 42 28.8	8.059
8	13 42 4.96	2.2963	15 47 4.4	13.937	8	15 41 50.00	2.6901	24 50 27.1	7.883
9	13 44 22.97	2.3041	16 0 58.3	13.859	9	15 44 31.62	2.6973	24 58 14.8	7.705
10	13 46 41.45	2.3119	16 14 47.5	13.780	10	15 47 13.67	2.7043	25 5 51.7	7.526
11	13 49 0.40	2.3198	16 28 31.9	13.700	11	15 49 56.13	2.7112	25 13 17.9	7.346
12	13 51 19.83	2.3278	16 42 11.5	13.618	12	15 52 39.01	2.7180	25 20 33.2	7.163
13	13 53 39.73	2.3358	16 55 46.1	13.533	13	15 55 22.29	2.7246	25 27 37.4	6.978
14	13 56 0.12	2.3438	17 9 15.5	13.447	14	15 58 5.96	2.7310	25 34 30.5	6.792
15	13 58 20.99	2.3519	17 22 39.7	13.358	15	16 0 50.01	2.7373	25 41 12.4	6.603
16	14 0 42.35	2.3602	17 35 58.5	13.268	16	16 3 34.44	2.7436	25 47 42.9	6.413
17	14 3 4.21	2.3684	17 49 11.8	13.175	17	16 6 19.24	2.7497	25 54 2.0	6.222
18	14 5 26.56	2.3766	18 2 19.5	13.080	18	16 9 4.40	2.7555	26 0 9.5	6.029
19	14 7 49.40	2.3849	18 15 21.4	12.983	19	16 11 49.90	2.7612	26 6 5.5	5.835
20	14 10 12.75	2.3933	18 28 17.5	12.885	20	16 14 35.74	2.7668	26 11 49.7	5.638
21	14 12 36.60	2.4017	18 41 7.6	12.783	21	16 17 21.91	2.7721	26 17 22.1	5.442
22	14 15 0.95	2.4101	18 53 51.5	12.679	22	16 20 8.39	2.7773	26 22 42.7	5.243
23	14 17 25.81	2.4185	19 6 29.1	12.574	23	16 22 55.18	2.7823	26 27 51.3	5.043
24	14 19 51.17	2.4269	S. 19 19 0.4	12.468	24	16 25 42.27	2.7872	S. 26 32 47.8	4.840

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 25.					SUNDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 25 42.27	2.7872	S. 26 32 47.8	4.840	0	18 40 52.84	2.7579	S. 26 21 37.2	5.249
1	16 28 29.64	2.7918	26 37 32.1	4.638	1	18 43 38.14	2.7520	26 16 16.4	5.443
2	16 31 17.29	2.7963	26 42 4.3	4.434	2	18 46 23.08	2.7459	26 10 44.0	5.637
3	16 34 5.20	2.8005	26 46 24.2	4.229	3	18 49 7.65	2.7397	26 5 0.0	5.828
4	16 36 53.35	2.8045	26 50 31.8	4.023	4	18 51 51.84	2.7333	25 59 4.6	6.018
5	16 39 41.74	2.8083	26 54 26.9	3.815	5	18 54 35.65	2.7268	25 52 57.9	6.205
6	16 42 30.35	2.8119	26 58 9.6	3.607	6	18 57 19.06	2.7201	25 46 40.0	6.392
7	16 45 19.17	2.8153	27 1 39.7	3.398	7	19 0 2.06	2.7132	25 40 10.9	6.577
8	16 48 8.19	2.8185	27 4 57.3	3.188	8	19 2 44.64	2.7062	25 33 30.8	6.759
9	16 50 57.39	2.8215	27 8 2.2	2.976	9	19 5 26.80	2.6991	25 26 39.8	6.941
10	16 53 46.77	2.8243	27 10 54.4	2.764	10	19 8 8.53	2.6918	25 19 37.9	7.121
11	16 56 36.30	2.8268	27 13 33.9	2.553	11	19 10 49.82	2.6845	25 12 25.3	7.298
12	16 59 25.98	2.8292	27 16 0.7	2.339	12	19 13 30.67	2.6770	25 5 2.2	7.473
13	17 2 15.80	2.8313	27 18 14.6	2.125	13	19 16 11.06	2.6693	24 57 28.6	7.640
14	17 5 5.73	2.8330	27 20 15.7	1.911	14	19 18 50.98	2.6614	24 49 44.7	7.817
15	17 7 55.76	2.8346	27 22 3.9	1.696	15	19 21 30.43	2.6536	24 41 50.6	7.986
16	17 10 45.88	2.8360	27 23 39.2	1.481	16	19 24 9.41	2.6457	24 33 46.4	8.153
17	17 13 36.08	2.8372	27 25 1.6	1.266	17	19 26 47.91	2.6376	24 25 32.2	8.319
18	17 16 26.34	2.8380	27 26 11.1	1.050	18	19 29 25.92	2.6294	24 17 8.1	8.483
19	17 19 16.64	2.8387	27 27 7.6	0.833	19	19 32 3.44	2.6213	24 8 34.2	8.645
20	17 22 6.98	2.8392	27 27 51.1	0.618	20	19 34 40.47	2.6130	23 59 50.7	8.804
21	17 24 57.34	2.8393	27 28 21.7	0.402	21	19 37 17.00	2.6046	23 50 57.7	8.962
22	17 27 47.70	2.8393	27 28 39.3	−0.185	22	19 39 53.02	2.5962	23 41 55.3	9.117
23	17 30 38.06	2.8391	S. 27 28 43.9	+0.032	23	19 42 28.53	2.5875	S. 23 32 43.7	9.269
	SATURDAY 26.					MONDAY 28.			
0	17 33 28.39	2.8385	S. 27 28 35.5	0.248	0	19 45 3.52	2.5789	S. 23 23 23.0	9.420
1	17 36 18.68	2.8378	27 28 14.1	0.464	1	19 47 38.00	2.5703	23 13 53.3	9.568
2	17 39 8.92	2.8368	27 27 39.8	0.679	2	19 50 11.95	2.5615	23 4 14.8	9.715
3	17 41 59.09	2.8355	27 26 52.6	0.895	3	19 52 45.38	2.5528	22 54 27.5	9.859
4	17 44 49.18	2.8340	27 25 52.4	1.110	4	19 55 18.28	2.5439	22 44 31.7	10.001
5	17 47 39.17	2.8323	27 24 39.4	1.324	5	19 57 50.65	2.5351	22 34 27.4	10.141
6	17 50 29.05	2.8303	27 23 13.5	1.539	6	20 0 22.49	2.5263	22 24 14.8	10.278
7	17 53 18.81	2.8282	27 21 34.7	1.753	7	20 2 53.80	2.5173	22 13 54.0	10.414
8	17 56 8.43	2.8258	27 19 43.2	1.965	8	20 5 24.57	2.5083	22 3 25.1	10.548
9	17 58 57.90	2.8231	27 17 38.9	2.178	9	20 7 54.80	2.4993	21 52 48.3	10.678
10	18 1 47.20	2.8203	27 15 21.8	2.390	10	20 10 24.49	2.4904	21 42 3.7	10.808
11	18 4 36.33	2.8172	27 12 52.1	2.601	11	20 12 53.65	2.4814	21 31 11.4	10.934
12	18 7 25.26	2.8138	27 10 9.7	2.812	12	20 15 22.26	2.4723	21 20 11.6	11.058
13	18 10 13.99	2.8103	27 7 14.7	3.021	13	20 17 50.33	2.4633	21 9 4.4	11.181
14	18 13 2.50	2.8066	27 4 7.2	3.229	14	20 20 17.86	2.4543	20 57 49.9	11.301
15	18 15 50.78	2.8026	27 0 47.2	3.437	15	20 22 44.85	2.4453	20 46 28.3	11.418
16	18 18 38.81	2.7984	26 57 14.8	3.643	16	20 25 11.30	2.4363	20 34 59.7	11.534
17	18 21 26.59	2.7940	26 53 30.0	3.848	17	20 27 37.21	2.4273	20 23 24.2	11.648
18	18 24 14.09	2.7894	26 49 33.0	4.052	18	20 30 2.58	2.4183	20 11 42.0	11.759
19	18 27 1.32	2.7848	26 45 23.8	4.255	19	20 32 27.41	2.4094	19 59 53.1	11.868
20	18 29 48.26	2.7798	26 41 2.4	4.457	20	20 34 51.71	2.4004	19 47 57.8	11.975
21	18 32 34.89	2.7745	26 36 29.0	4.657	21	20 37 15.46	2.3914	19 35 56.1	12.080
22	18 35 21.20	2.7692	26 31 43.6	4.856	22	20 39 38.68	2.3826	19 23 48.2	12.183
23	18 38 7.19	2.7637	26 26 46.3	5.053	23	20 42 1.37	2.3738	19 11 34.2	12.283
24	18 40 52.84	2.7579	S. 26 21 37.2	5.249	24	20 44 23.53	2.3648	S. 18 59 14.3	12.381

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 29.			
	h m s	s	° ′ ″	″
0	20 44 23.53	2.3648	S. 18 59 14.3	12.381
1	20 46 45.15	2.3560	18 46 48.5	12.478
2	20 49 6.25	2.3473	18 34 17.0	12.572
3	20 51 26.82	2.3385	18 21 39.9	12.664
4	20 53 46.87	2.3298	18 8 57.3	12.754
5	20 56 6.40	2.3212	17 56 9.4	12.843
6	20 58 25.41	2.3126	17 43 16.2	12.928
7	21 0 43.91	2.3041	17 30 18.0	13.012
8	21 3 1.90	2.2955	17 17 14.8	13.093
9	21 5 19.37	2.2870	17 4 6.8	13.173
10	21 7 36.34	2.2787	16 50 54.0	13.252
11	21 9 52.81	2.2703	16 37 36.6	13.327
12	21 12 8.78	2.2621	16 24 14.8	13.400
13	21 14 24.26	2.2539	16 10 48.6	13.473
14	21 16 39.25	2.2458	15 57 18.1	13.543
15	21 18 53.75	2.2376	15 43 43.5	13.611
16	21 21 7.76	2.2296	15 30 4.8	13.678
17	21 23 21.30	2.2217	15 16 22.2	13.742
18	21 25 34.36	2.2138	15 2 35.8	13.804
19	21 27 46.95	2.2060	14 48 45.7	13.864
20	21 29 59.08	2.1983	14 34 52.1	13.923
21	21 32 10.75	2.1907	14 20 55.0	13.981
22	21 34 21.96	2.1830	14 6 54.4	14.036
23	21 36 32.71	2.1755	S. 13 52 50.6	14.089
	WEDNESDAY 30.			
0	21 38 43.02	2.1682	S. 13 38 43.7	14.140
1	21 40 52.89	2.1608	13 24 33.8	14.190
2	21 43 2.32	2.1535	13 10 20.9	14.239
3	21 45 11.31	2.1463	12 56 5.1	14.286
4	21 47 19.88	2.1393	12 41 46.6	14.331
5	21 49 28.03	2.1323	12 27 25.4	14.374
6	21 51 35.76	2.1253	12 13 1.7	14.416
7	21 53 43.07	2.1185	11 58 35.5	14.456
8	21 55 49.98	2.1118	11 44 7.0	14.494
9	21 57 56.48	2.1050	11 29 36.2	14.532
10	22 0 2.58	2.0984	11 15 3.2	14.567
11	22 2 8.29	2.0920	11 0 28.2	14.600
12	22 4 13.62	2.0856	10 45 51.2	14.633
13	22 6 18.56	2.0793	10 31 12.3	14.663
14	22 8 23.13	2.0731	10 16 31.6	14.693
15	22 10 27.33	2.0670	10 1 49.2	14.720
16	22 12 31.17	2.0609	9 47 5.2	14.747
17	22 14 34.64	2.0548	9 32 19.6	14.772
18	22 16 37.75	2.0490	9 17 32.6	14.795
19	22 18 40.52	2.0433	9 2 44.2	14.818
20	22 20 42.95	2.0377	8 47 54.5	14.838
21	22 22 45.04	2.0320	8 33 3.7	14.857
22	22 24 46.79	2.0265	8 18 11.7	14.876
23	22 26 48.22	2.0211	8 3 18.6	14.893
24	22 28 49.32	2.0158	S. 7 48 24.6	14.908

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY, JULY 1.			
	h m s	s	° ′ ″	″
0	22 28 49.32	2.0158	S. 7 48 24.6	14.908

PHASES OF THE MOON.

			d	h	m
☾	Last Quarter	June	4	4	32.1
●	New Moon		12	6	57.3
☽	First Quarter		20	2	24.3
○	Full Moon		26	16	27.4

			d	h
☾	Apogee	June	10	12.4
☾	Perigee		25	14.1

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Thur.	1	6 37 16.82	10.347	N.23 10 31.5	− 9.21	15 45.69	68.78	3 26.38	0.489
Fri.	2	6 41 25.05	10.338	23 6 38.3	10.22	15 45.67	68.75	3 38.02	0.480
Sat.	3	6 45 33.04	10.328	23 2 20.8	11.23	15 45.66	68.71	3 49.43	0.470
SUN.	4	6 49 40.78	10.316	22 57 39.2	−12.24	15 45.65	68.67	4 0.57	0.459
Mon.	5	6 53 48.23	10.304	22 52 33.4	13.24	15 45.64	68.63	4 11.44	0.446
Tues.	6	6 57 55.38	10.291	22 47 3.8	14.23	15 45.64	68.58	4 22.00	0.433
Wed.	7	7 2 2.21	10.277	22 41 10.3	−15.22	15 45.65	68.53	4 32.24	0.419
Thur.	8	7 6 8.69	10.262	22 34 53.1	16.20	15 45.66	68.48	4 42.14	0.405
Fri.	9	7 10 14.81	10.247	22 28 12.4	17.18	15 45.68	68.42	4 51.67	0.389
Sat.	10	7 14 20.54	10.230	22 21 8.4	−18.15	15 45.70	68.36	5 0.82	0.372
SUN.	11	7 18 25.86	10.213	22 13 41.2	19.11	15 45.72	68.30	5 9.56	0.355
Mon.	12	7 22 30.75	10.195	22 5 51.0	20.07	15 45.75	68.24	5 17.87	0.337
Tues.	13	7 26 35.20	10.176	21 57 37.9	−21.01	15 45.79	68.17	5 25.74	0.318
Wed.	14	7 30 39.18	10.156	21 49 2.3	21.95	15 45.84	68.11	5 33.14	0.298
Thur.	15	7 34 42.68	10.135	21 40 4.3	22.88	15 45.89	68.04	5 40.06	0.278
Fri.	16	7 38 45.67	10.114	21 30 44.1	−23.80	15 45.94	67.97	5 46.48	0.257
Sat.	17	7 42 48.14	10.092	21 21 2.0	24.71	15 46.00	67.90	5 52.37	0.235
SUN.	18	7 46 50.08	10.069	21 10 58.1	25.61	15 46.06	67.83	5 57.74	0.212
Mon.	19	7 50 51.47	10.046	21 0 32.9	−26.50	15 46.13	67.76	6 2.56	0.189
Tues.	20	7 54 52.30	10.023	20 49 46.3	27.38	15 46.21	67.69	6 6.82	0.166
Wed.	21	7 58 52.56	9.999	20 38 38.8	28.24	15 46.29	67.61	6 10.52	0.142
Thur.	22	8 2 52.25	9.975	20 27 10.6	−29.10	15 46.37	67.53	6 13.64	0.118
Fri.	23	8 6 51.34	9.950	20 15 21.9	29.95	15 46.46	67.45	6 16.17	0.093
Sat.	24	8 10 49.85	9.926	20 3 12.9	30.79	15 46.55	67.37	6 18.12	0.069
SUN.	25	8 14 47.78	9.901	19 50 43.9	−31.62	15 46.64	67.28	6 19.48	0.044
Mon.	26	8 18 45.10	9.877	19 37 55.2	32.44	15 46.73	67.20	6 20.25	0.020
Tues.	27	8 22 41.84	9.852	19 24 46.9	33.25	15 46.83	67.11	6 20.43	0.005
Wed.	28	8 26 37.98	9.827	19 11 19.2	−34.05	15 46.93	67.03	6 20.01	0.029
Thur.	29	8 30 33.54	9.802	18 57 32.6	34.84	15 47.03	66.94	6 19.01	0.054
Fri.	30	8 34 28.50	9.778	18 43 27.2	35.61	15 47.14	66.85	6 17.42	0.078
Sat.	31	8 38 22.87	9.753	18 29 3.2	36.38	15 47.25	66.76	6 15.24	0.103
SUN.	32	8 42 16.66	9.728	N.18 14 20.9	−37.14	15 47.36	66.68	6 12.48	0.127

Note.—The mean time of semidiameter passing the meridian may be found by subtracting 0s.19 from the sidereal time.

The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Thur.	1	6 37 16.23	10.346	N. 23 10 32.0	− 9.21	3 26.36	0.489	6 33 49.87
Fri.	2	6 41 24.42	10.337	23 6 38.9	10.22	3 38.00	0.480	6 37 46.43
Sat.	3	6 45 32.38	10.326	23 2 21.5	11.23	3 49.40	0.470	6 41 42.99
SUN.	4	6 49 40.09	10.315	22 57 40.0	−12.23	4 0.54	0.459	6 45 39.55
Mon.	5	6 53 47.51	10.303	22 52 34.4	13.23	4 11.41	0.446	6 49 36.10
Tues.	6	6 57 54.64	10.290	22 47 4.8	14.23	4 21.97	0.433	6 53 32.66
Wed.	7	7 2 1.43	10.276	22 41 11.4	−15.22	4 32.21	0.419	6 57 29.22
Thur.	8	7 6 7.89	10.261	22 34 54.4	16.20	4 42.11	0.405	7 1 25.78
Fri.	9	7 10 13.98	10.246	22 28 13.8	17.18	4 51.64	0.389	7 5 22.34
Sat.	10	7 14 19.68	10.229	22 21 9.9	−18.15	5 0.78	0.372	7 9 18.90
SUN.	11	7 18 24.98	10.212	22 13 42.9	19.11	5 9.53	0.355	7 13 15.45
Mon.	12	7 22 29.85	10.194	22 5 52.8	20.06	5 17.84	0.337	7 17 12.01
Tues.	13	7 26 34.28	10.175	21 57 39.8	−21.01	5 25.71	0.318	7 21 8.57
Wed.	14	7 30 38.24	10.155	21 49 4.3	21.95	5 33.11	0.298	7 25 5.13
Thur.	15	7 34 41.72	10.134	21 40 6.4	22.87	5 40.03	0.278	7 29 1.69
Fri.	16	7 38 44.69	10.113	21 30 46.4	−23.79	5 46.45	0.257	7 32 58.24
Sat.	17	7 42 47.15	10.091	21 21 4.4	24.70	5 52.35	0.235	7 36 54.80
SUN.	18	7 46 49.08	10.069	21 11 0.7	25.60	5 57.72	0.212	7 40 51.36
Mon.	19	7 50 50.46	10.046	21 0 35.5	−26.49	6 2.54	0.189	7 44 47.92
Tues.	20	7 54 51.28	10.022	20 49 49.1	27.37	6 6.80	0.166	7 48 44.47
Wed.	21	7 58 51.53	9.998	20 38 41.7	28.24	6 10.50	0.142	7 52 41.03
Thur.	22	8 2 51.21	9.974	20 27 13.6	−29.10	6 13.62	0.118	7 56 37.59
Fri.	23	8 6 50.30	9.950	20 15 25.0	29.95	6 16.16	0.093	8 0 34.14
Sat.	24	8 10 48.81	9.926	20 3 16.1	30.79	6 18.11	0.069	8 4 30.70
SUN.	25	8 14 46.73	9.901	19 50 47.2	−31.62	6 19.47	0.044	8 8 27.26
Mon.	26	8 18 44.06	9.876	19 37 58.6	32.44	6 20.24	0.020	8 12 23.82
Tues.	27	8 22 40.80	9.852	19 24 50.4	33.24	6 20.43	0.005	8 16 20.37
Wed.	28	8 26 36.95	9.827	19 11 22.8	−34.04	6 20.02	0.029	8 20 16.93
Thur.	29	8 30 32.50	9.803	18 57 36.3	34.83	6 19.02	0.054	8 24 13.49
Fri.	30	8 34 27.47	9.778	18 43 30.9	35.61	6 17.43	0.078	8 28 10.04
Sat.	31	8 38 21.86	9.754	18 29 7.0	36.38	6 15.25	0.103	8 32 6.60
SUN.	32	8 42 15.65	9.729	N. 18 14 24.8	−37.14	6 12.49	0.127	8 36 3.16

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour, $+9^{s}.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S True Longitude. λ	THE SUN'S True Longitude. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S Latitude.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	182	98 33 55.4	33 19.2	142.97	+0.26	0.007 2019	+ 3.6	17 23 18.74
2	183	99 31 6.7	30 30.3	142.97	0.38	0.007 2098	2.9	17 19 22.83
3	184	100 28 18.2	27 41.6	142.98	0.49	0.007 2158	2.1	17 15 26.91
4	185	101 25 30.0	24 53.1	142.99	+0.58	0.007 2199	+ 1.2	17 11 31.00
5	186	102 22 42.0	22 4.9	143.00	0.65	0.007 2218	+ 0.3	17 7 35.09
6	187	103 19 54.2	19 17.0	143.02	0.68	0.007 2216	− 0.6	17 3 39.18
7	188	104 17 6.8	16 29.4	143.03	+0.70	0.007 2190	− 1.6	16 59 43.26
8	189	105 14 19.7	13 42.1	143.04	0.68	0.007 2141	2.6	16 55 47.35
9	190	106 11 32.8	10 55.1	143.05	0.63	0.007 2068	3.6	16 51 51.44
10	191	107 8 46.3	8 8.3	143.07	+0.57	0.007 1969	− 4.6	16 47 55.53
11	192	108 6 0.0	5 21.9	143.08	0.48	0.007 1846	5.7	16 43 59.62
12	193	109 3 14.0	2 35.7	143.09	0.37	0.007 1696	6.8	16 40 3.70
13	194	109 60 28.3	59 49.8	143.10	+0.24	0.007 1521	− 7.8	16 36 7.79
14	195	110 57 42.8	57 4.1	143.11	+0.11	0.007 1320	8.9	16 32 11.88
15	196	111 54 57.5	54 18.6	143.12	−0.03	0.007 1094	10.0	16 28 15.97
16	197	112 52 12.3	51 33.3	143.12	−0.17	0.007 0842	−11.0	16 24 20.06
17	198	113 49 27.4	48 48.2	143.13	0.29	0.007 0567	12.0	16 20 24.14
18	199	114 46 42.6	46 3.2	143.14	0.38	0.007 0268	12.9	16 16 28.23
19	200	115 43 58.0	43 18.4	143.14	−0.45	0.006 9948	−13.8	16 12 32.32
20	201	116 41 13.5	40 33.8	143.15	0.50	0.006 9606	14.6	16 8 36.41
21	202	117 38 29.3	37 49.4	143.16	0.51	0.006 9247	15.3	16 4 40.50
22	203	118 35 45.3	35 5.2	143.17	−0.48	0.006 8869	−16.0	16 0 44.59
23	204	119 33 1.6	32 21.4	143.19	0.42	0.006 8476	16.6	15 56 48.68
24	205	120 30 18.3	29 37.9	143.21	0.33	0.006 8068	17.2	15 52 52.76
25	206	121 27 35.5	26 54.9	143.23	−0.22	0.006 7647	−17.8	15 48 56.85
26	207	122 24 53.2	24 12.5	143.26	−0.09	0.006 7212	18.4	15 45 0.94
27	208	123 22 11.7	21 30.8	143.29	+0.05	0.006 6766	18.9	15 41 5.03
28	209	124 19 30.9	18 49.9	143.33	+0.18	0.006 6306	−19.4	15 37 9.12
29	210	125 16 51.1	16 9.9	143.36	0.31	0.006 5832	20.0	15 33 13.21
30	211	126 14 12.2	13 30.8	143.40	0.43	0.006 5345	20.6	15 29 17.30
31	212	127 11 34.4	10 52.8	143.45	0.52	0.006 4843	21.3	15 25 21.38
32	213	128 8 57.6	8 15.9	143.50	+0.58	0.006 4325	−22.0	15 21 25.47

Note.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,
−9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 43.4	15 35.8	57 36.33	−2.341	57 8.59	−2.275	16 24.7	1.83	18.7
2	15 28.5	15 21.6	56 41.87	2.173	56 16.57	2.039	17 7.7	1.76	19.7
3	15 15.2	15 9.3	55 53.02	1.882	55 31.47	1.706	17 49.7	1.75	20.7
4	15 4.1	14 59.4	55 12.12	−1.517	54 55.09	−1.320	18 31.9	1.78	21.7
5	14 55.4	14 52.1	54 40.46	1.118	54 28.26	0.916	19 15.3	1.85	22.7
6	14 49.5	14 47.4	54 18.48	0.715	54 11.08	0.519	20 0.7	1.94	23.7
7	14 46.0	14 45.3	54 5.99	−0.331	54 3.10	−0.152	20 48.4	2.04	24.7
8	14 45.0	14 45.4	54 2.30	+0.017	54 3.45	+0.173	21 38.3	2.11	25.7
9	14 46.2	14 47.4	54 6.41	0.318	54 11.03	0.451	22 29.7	2.15	26.7
10	14 49.1	14 51.2	54 17.18	+0.572	54 24.71	+0.681	23 21.4	2.15	27.7
11	14 53.5	14 56.2	54 33.48	0.778	54 43.35	0.865	∂	. .	28.7
12	14 59.2	15 2.4	54 54.21	0.943	55 5.95	1.012	0 12.3	2.08	0.1
13	15 5.8	15 9.4	55 18.48	+1.075	55 31.73	+1.133	1 1.3	2.00	1.1
14	15 13.2	15 17.2	55 45.65	1.186	56 0.18	1.235	1 48.4	1.92	2.1
15	15 21.3	15 25.6	56 15.29	1.282	56 30.95	1.328	2 33.7	1.86	3.1
16	15 30.0	15 34.5	56 47.15	+1.372	57 3.86	+1.412	3 18.0	1.84	4.1
17	15 39.2	15 44.0	57 21.01	1.445	57 38.52	1.472	4 2.3	1.86	5.1
18	15 48.8	15 53.7	57 56.30	1.490	58 14.23	1.496	4 47.8	1.94	6.1
19	15 58.6	16 3.4	58 32.14	+1.486	58 49.81	+1.454	5 36.0	2.08	7.1
20	16 8.1	16 12.5	59 6.94	1.396	59 23.21	1.310	6 28.0	2.27	8.1
21	16 16.6	16 20.2	59 38.26	1.192	59 51.70	1.042	7 25.0	2.48	9.1
22	16 23.4	16 25.8	60 3.14	+0.859	60 12.18	+0.642	8 26.6	2.65	10.1
23	16 27.5	16 28.4	60 18.42	+0.393	60 21.51	+0.119	9 31.5	2.72	11.1
24	16 28.3	16 27.3	60 21.22	−0.170	60 17.40	−0.467	10 36.4	2.66	12.1
25	16 25.2	16 22.3	60 10.01	−0.764	59 59.10	−1.051	11 38.3	2.49	13.1
26	16 18.4	16 13.7	59 44.86	1.318	59 27.59	1.555	12 35.5	2.28	14.1
27	16 8.3	16 2.2	59 7.68	1.756	58 45.62	1.914	13 27.6	2.08	15.1
28	15 55.8	15 49.0	58 21.93	−2.027	57 57.16	−2.094	14 15.5	1.93	16.1
29	15 42.2	15 35.2	57 31.85	2.116	57 6.54	2.095	15 0.5	1.83	17.1
30	15 28.5	15 22.0	56 41.72	2.035	56 17.84	1.939	15 43.8	1.79	18.1
31	15 15.8	15 10.2	55 55.30	1.813	55 34.43	1.661	16 26.7	1.80	19.1
32	15 5.0	15 0.4	55 15.52	−1.488	54 58.79	−1.298	17 10.3	1.84	20.1

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 1.					**SATURDAY 3.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 28 49.32	2.0158	S. 7 48 24.6	14.908	0	0 1 11.36	1.8669	N. 4 3 25.6	14.378
1	22 30 50.11	2.0106	7 33 29.7	14.922	1	0 3 3.34	1.8659	4 17 47.3	14.344
2	22 32 50.59	2.0054	7 18 34.0	14.934	2	0 4 55.27	1.8650	4 32 6.9	14.310
3	22 34 50.76	2.0004	7 3 37.6	14.945	3	0 6 47.14	1.8642	4 46 24.5	14.277
4	22 36 50.64	1.9955	6 48 40.6	14.956	4	0 8 38.97	1.8634	5 0 40.1	14.242
5	22 38 50.22	1.9906	6 33 42.9	14.965	5	0 10 30.75	1.8628	5 14 53.5	14.205
6	22 40 49.51	1.9858	6 18 44.8	14.973	6	0 12 22.50	1.8622	5 29 4.7	14.168
7	22 42 48.52	1.9812	6 3 46.2	14.979	7	0 14 14.21	1.8616	5 43 13.7	14.131
8	22 44 47.25	1.9766	5 48 47.3	14.985	8	0 16 5.89	1.8612	5 57 20.4	14.093
9	22 46 45.71	1.9721	5 33 48.0	14.990	9	0 17 57.55	1.8608	6 11 24.8	14.054
10	22 48 43.90	1.9677	5 18 48.5	14.993	10	0 19 49.19	1.8606	6 25 26.9	14.015
11	22 50 41.83	1.9634	5 3 48.9	14.994	11	0 21 40.82	1.8603	6 39 26.6	13.974
12	22 52 39.51	1.9593	4 48 49.2	14.995	12	0 23 32.43	1.8602	6 53 23.8	13.933
13	22 54 36.94	1.9551	4 33 49.5	14.995	13	0 25 24.04	1.8602	7 7 18.6	13.892
14	22 56 34.12	1.9510	4 18 49.8	14.994	14	0 27 15.65	1.8602	7 21 10.8	13.848
15	22 58 31.06	1.9471	4 3 50.2	14.992	15	0 29 7.26	1.8602	7 35 0.4	13.806
16	23 0 27.77	1.9433	3 48 50.8	14.988	16	0 30 58.87	1.8603	7 48 47.5	13.763
17	23 2 24.25	1.9395	3 33 51.7	14.983	17	0 32 50.50	1.8607	8 2 31.9	13.718
18	23 4 20.51	1.9359	3 18 52.9	14.978	18	0 34 42.15	1.8609	8 16 13.7	13.673
19	23 6 16.56	1.9323	3 3 54.4	14.972	19	0 36 33.81	1.8613	8 29 52.7	13.627
20	23 8 12.39	1.9288	2 48 56.3	14.964	20	0 38 25.50	1.8618	8 43 28.9	13.580
21	23 10 8.02	1.9254	2 33 58.7	14.955	21	0 40 17.22	1.8623	8 57 2.3	13.533
22	23 12 3.44	1.9221	2 19 1.7	14.945	22	0 42 8.97	1.8628	9 10 32.9	13.485
23	23 13 58.67	1.9189	S. 2 4 5.3	14.934	23	0 44 0.76	1.8636	N. 9 24 0.5	13.436
	FRIDAY 2.					**SUNDAY 4.**			
0	23 15 53.71	1.9158	S. 1 49 9.6	14.923	0	0 45 52.60	1.8643	N. 9 37 25.2	13.387
1	23 17 48.57	1.9128	1 34 14.6	14.910	1	0 47 44.48	1.8651	9 50 46.9	13.337
2	23 19 43.25	1.9098	1 19 20.4	14.897	2	0 49 36.41	1.8659	10 4 5.6	13.287
3	23 21 37.75	1.9069	1 4 27.0	14.883	3	0 51 28.39	1.8668	10 17 21.3	13.235
4	23 23 32.08	1.9042	0 49 34.5	14.868	4	0 53 20.43	1.8679	10 30 33.8	13.183
5	23 25 26.25	1.9016	0 34 42.9	14.851	5	0 55 12.54	1.8690	10 43 43.2	13.130
6	23 27 20.27	1.8990	0 19 52.4	14.833	6	0 57 4.71	1.8701	10 56 49.4	13.077
7	23 29 14.13	1.8964	S. 0 5 2.9	14.815	7	0 58 56.95	1.8713	11 9 52.4	13.022
8	23 31 7.84	1.8940	N. 0 9 45.4	14.796	8	1 0 49.27	1.8726	11 22 52.2	12.968
9	23 33 1.41	1.8917	0 24 32.6	14.777	9	1 2 41.66	1.8739	11 35 48.6	12.913
10	23 34 54.84	1.8894	0 39 18.6	14.756	10	1 4 34.14	1.8753	11 48 41.7	12.857
11	23 36 48.14	1.8873	0 54 3.3	14.733	11	1 6 26.70	1.8768	12 1 31.4	12.800
12	23 38 41.32	1.8853	1 8 46.6	14.711	12	1 8 19.36	1.8784	12 14 17.7	12.743
13	23 40 34.37	1.8833	1 23 28.6	14.688	13	1 10 12.11	1.8799	12 27 0.5	12.684
14	23 42 27.31	1.8813	1 38 9.2	14.664	14	1 12 4.95	1.8816	12 39 39.8	12.626
15	23 44 20.13	1.8795	1 52 48.3	14.638	15	1 13 57.90	1.8833	12 52 15.6	12.566
16	23 46 12.85	1.8778	2 7 25.8	14.613	16	1 15 50.95	1.8851	13 4 47.7	12.505
17	23 48 5.47	1.8762	2 22 1.8	14.587	17	1 17 44.11	1.8869	13 17 16.2	12.445
18	23 49 57.99	1.8746	2 36 36.2	14.559	18	1 19 37.38	1.8888	13 29 41.1	12.384
19	23 51 50.42	1.8731	2 51 8.9	14.531	19	1 21 30.77	1.8908	13 42 2.3	12.322
20	23 53 42.76	1.8717	3 5 39.9	14.502	20	1 23 24.27	1.8928	13 54 19.7	12.258
21	23 55 35.02	1.8703	3 20 9.1	14.472	21	1 25 17.90	1.8949	14 6 33.3	12.195
22	23 57 27.20	1.8691	3 34 36.5	14.441	22	1 27 11.66	1.8970	14 18 43.1	12.132
23	23 59 19.31	1.8680	3 49 2.0	14.409	23	1 29 5.54	1.8992	14 30 49.1	12.067
24	0 1 11.36	1.8669	N. 4 3 25.6	14.378	24	1 30 59.56	1.9014	N. 14 42 51.1	12.000

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

our.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 5.					**WEDNESDAY 7.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	1 30 59.56	1.9014	N. 14 42 51.1	12.000	0	3 5 41.33	2.0568	N. 22 50 4.7	8.025
1	1 32 53.71	1.9037	14 54 49.1	11.934	1	3 7 44.85	2.0605	22 58 3.2	7.925
2	1 34 48.00	1.9060	15 6 43.2	11.868	2	3 9 48.59	2.0643	23 5 55.7	7.824
3	1 36 42.43	1.9084	15 18 33.2	11.800	3	3 11 52.56	2.0681	23 13 42.1	7.722
4	1 38 37.01	1.9109	15 30 19.2	11.732	4	3 13 56.76	2.0719	23 21 22.3	7.619
5	1 40 31.74	1.9134	15 42 1.0	11.663	5	3 16 1.19	2.0758	23 28 56.4	7.516
6	1 42 26.62	1.9160	15 53 38.7	11.593	6	3 18 5.85	2.0795	23 36 24.2	7.412
7	1 44 21.66	1.9186	16 5 12.2	11.523	7	3 20 10.73	2.0833	23 43 45.8	7.307
8	1 46 16.85	1.9212	16 16 41.4	11.451	8	3 22 15.84	2.0871	23 51 1.0	7.201
9	1 48 12.20	1.9239	16 28 6.3	11.379	9	3 24 21.18	2.0908	23 58 9.9	7.095
10	1 50 7.72	1.9268	16 39 26.9	11.308	10	3 26 26.74	2.0946	24 5 12.4	6.988
11	1 52 3.41	1.9295	16 50 43.2	11.234	11	3 28 32.53	2.0983	24 12 8.5	6.881
12	1 53 59.26	1.9323	17 1 55.0	11.160	12	3 30 38.54	2.1020	24 18 58.1	6.773
13	1 55 55.28	1.9352	17 13 2.4	11.086	13	3 32 44.77	2.1058	24 25 41.2	6.663
14	1 57 51.48	1.9382	17 24 5.3	11.010	14	3 34 51.23	2.1095	24 32 17.7	6.553
15	1 59 47.86	1.9412	17 35 3.6	10.934	15	3 36 57.91	2.1132	24 38 47.6	6.443
16	2 1 44.42	1.9442	17 45 57.4	10.858	16	3 39 4.81	2.1168	24 45 10.8	6.331
17	2 3 41.16	1.9472	17 56 46.6	10.781	17	3 41 11.93	2.1204	24 51 27.3	6.219
18	2 5 38.08	1.9503	18 7 31.1	10.703	18	3 43 19.26	2.1240	24 57 37.1	6.108
19	2 7 35.19	1.9534	18 18 10.9	10.624	19	3 45 26.81	2.1277	25 3 40.2	5.994
20	2 9 32.49	1.9566	18 28 46.0	10.545	20	3 47 34.58	2.1313	25 9 36.4	5.880
21	2 11 29.98	1.9598	18 39 16.3	10.464	21	3 49 42.56	2.1348	25 15 25.8	5.766
22	2 13 27.67	1.9632	18 49 41.7	10.383	22	3 51 50.75	2.1383	25 21 8.3	5.651
23	2 15 25.56	1.9664	N. 19 0 2.3	10.302	23	3 53 59.15	2.1418	N. 25 26 43.9	5.534
	TUESDAY 6.					**THURSDAY 8.**			
0	2 17 23.64	1.9697	N. 19 10 17.9	10.219	0	3 56 7.76	2.1453	N. 25 32 12.4	5.418
1	2 19 21.92	1.9731	19 20 28.6	10.137	1	3 58 16.58	2.1487	25 37 34.0	5.301
2	2 21 20.41	1.9765	19 30 34.3	10.053	2	4 0 25.60	2.1520	25 42 48.5	5.183
3	2 23 19.10	1.9798	19 40 34.9	9.968	3	4 2 34.82	2.1553	25 47 55.9	5.064
4	2 25 17.99	1.9833	19 50 30.4	9.883	4	4 4 44.24	2.1587	25 52 56.2	4.945
5	2 27 17.09	1.9868	20 0 20.8	9.797	5	4 6 53.86	2.1620	25 57 49.3	4.826
6	2 29 16.40	1.9903	20 10 6.0	9.710	6	4 9 3.68	2.1653	26 2 35.3	4.706
7	2 31 15.93	1.9938	20 19 46.0	9.623	7	4 11 13.69	2.1684	26 7 14.0	4.585
8	2 33 15.66	1.9973	20 29 20.7	9.534	8	4 13 23.89	2.1715	26 11 45.5	4.463
9	2 35 15.61	2.0010	20 38 50.1	9.446	9	4 15 34.27	2.1746	26 16 9.6	4.341
10	2 37 15.78	2.0046	20 48 14.2	9.357	10	4 17 44.84	2.1777	26 20 26.4	4.219
11	2 39 16.16	2.0082	20 57 32.9	9.266	11	4 19 55.59	2.1807	26 24 35.9	4.096
12	2 41 16.76	2.0118	21 6 46.1	9.175	12	4 22 6.52	2.1837	26 28 37.9	3.972
13	2 43 17.58	2.0155	21 15 53.9	9.083	13	4 24 17.63	2.1866	26 32 32.5	3.848
14	2 45 18.62	2.0192	21 24 56.1	8.991	14	4 26 28.91	2.1894	26 36 19.6	3.723
15	2 47 19.88	2.0228	21 33 52.8	8.898	15	4 28 40.36	2.1922	26 39 59.3	3.598
16	2 49 21.36	2.0266	21 42 43.8	8.803	16	4 30 51.97	2.1949	26 43 31.4	3.472
17	2 51 23.07	2.0303	21 51 29.2	8.709	17	4 33 3.75	2.1977	26 46 55.9	3.345
18	2 53 25.00	2.0340	22 0 8.9	8.613	18	4 35 15.69	2.2002	26 50 12.8	3.218
19	2 55 27.15	2.0378	22 8 42.8	8.518	19	4 37 27.78	2.2028	26 53 22.1	3.091
20	2 57 29.53	2.0416	22 17 11.0	8.421	20	4 39 40.02	2.2053	26 56 23.7	2.963
21	2 59 32.14	2.0454	22 25 33.3	8.323	21	4 41 52.41	2.2078	26 59 17.7	2.835
22	3 1 34.98	2.0492	22 33 49.7	8.224	22	4 44 4.95	2.2102	27 2 3.9	2.706
23	3 3 38.04	2.0529	22 42 0.2	8.125	23	4 46 17.63	2.2125	27 4 42.4	2.578
24	3 5 41.33	2.0568	N. 22 50 4.7	8.025	24	4 48 30.45	2.2148	N. 27 7 13.2	2.448

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 9.					**SUNDAY 11.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 48 30.45	2.2148	N. 27 7 13.2	2.448	0	6 35 59.62	2.2337	N. 26 30 39.3	3.99
1	4 50 43.40	2.2169	27 9 36.2	2.318	1	6 38 13.60	2.2322	26 26 35.6	4.12
2	4 52 56.48	2.2190	27 11 51.3	2.187	2	6 40 27.48	2.2306	26 22 24.0	4.26
3	4 55 9.68	2.2211	27 13 58.6	2.057	3	6 42 41.27	2.2290	26 18 4.4	4.39
4	4 57 23.01	2.2231	27 15 58.1	1.926	4	6 44 54.96	2.2273	26 13 37.0	4.52
5	4 59 36.45	2.2250	27 17 49.7	1.793	5	6 47 8.54	2.2254	26 9 1.7	4.65
6	5 1 50.01	2.2268	27 19 33.3	1.661	6	6 49 22.01	2.2237	26 4 18.5	4.78
7	5 4 3.67	2.2286	27 21 9.0	1.529	7	6 51 35.38	2.2218	25 59 27.5	4.90
8	5 6 17.44	2.2303	27 22 36.8	1.398	8	6 53 48.63	2.2198	25 54 28.6	5.04
9	5 8 31.30	2.2318	27 23 56.7	1.265	9	6 56 1.76	2.2178	25 49 22.0	5.17
10	5 10 45.26	2.2335	27 25 8.6	1.132	10	6 58 14.76	2.2157	25 44 7.7	5.30
11	5 12 59.32	2.2350	27 26 12.5	0.998	11	7 0 27.64	2.2136	25 38 45.6	5.43
12	5 15 13.46	2.2363	27 27 8.3	0.863	12	7 2 40.39	2.2114	25 33 15.8	5.56
13	5 17 27.68	2.2377	27 27 56.1	0.730	13	7 4 53.01	2.2092	25 27 38.4	5.68
14	5 19 41.98	2.2389	27 28 35.9	0.596	14	7 7 5.49	2.2068	25 21 53.3	5.81
15	5 21 56.35	2.2400	27 29 7.6	0.462	15	7 9 17.83	2.2044	25 16 0.6	5.94
16	5 24 10.78	2.2411	27 29 31.3	0.328	16	7 11 30.02	2.2020	25 10 0.4	6.067
17	5 26 25.28	2.2422	27 29 46.9	0.193	17	7 13 42.07	2.1996	25 3 52.6	6.193
18	5 28 39.84	2.2431	27 29 54.4	+0.058	18	7 15 53.97	2.1971	24 57 37.3	6.318
19	5 30 54.45	2.2439	27 29 53.8	−0.078	19	7 18 5.72	2.1945	24 51 14.5	6.44
20	5 33 9.11	2.2447	27 29 45.1	0.213	20	7 20 17.31	2.1918	24 44 44.3	6.565
21	5 35 23.81	2.2453	27 29 28.2	0.349	21	7 22 28.74	2.1892	24 38 6.7	6.688
22	5 37 38.55	2.2460	27 29 3.2	0.484	22	7 24 40.01	2.1865	24 31 21.7	6.811
23	5 39 53.33	2.2465	N. 27 28 30.1	0.620	23	7 26 51.12	2.1838	N. 24 24 29.3	6.933
	SATURDAY 10.					**MONDAY 12.**			
0	5 42 8.13	2.2469	N. 27 27 48.8	0.756	0	7 29 2.06	2.1810	N. 24 17 29.7	7.054
1	5 44 22.96	2.2473	27 26 59.4	0.892	1	7 31 12.84	2.1782	24 10 22.8	7.175
2	5 46 37.81	2.2476	27 26 1.8	1.028	2	7 33 23.44	2.1753	24 3 8.7	7.294
3	5 48 52.67	2.2478	27 24 56.1	1.163	3	7 35 33.87	2.1724	23 55 47.5	7.413
4	5 51 7.54	2.2479	27 23 42.3	1.298	4	7 37 44.13	2.1695	23 48 19.1	7.533
5	5 53 22.42	2.2480	27 22 20.3	1.435	5	7 39 54.21	2.1665	23 40 43.5	7.652
6	5 55 37.30	2.2479	27 20 50.1	1.571	6	7 42 4.11	2.1635	23 33 0.9	7.768
7	5 57 52.17	2.2478	27 19 11.8	1.707	7	7 44 13.83	2.1605	23 25 11.3	7.884
8	6 0 7.03	2.2476	27 17 25.3	1.843	8	7 46 23.37	2.1575	23 17 14.8	8.000
9	6 2 21.88	2.2473	27 15 30.7	1.978	9	7 48 32.73	2.1544	23 9 11.3	8.116
10	6 4 36.71	2.2470	27 13 27.9	2.114	10	7 50 41.90	2.1513	23 1 0.9	8.231
11	6 6 51.52	2.2465	27 11 17.0	2.249	11	7 52 50.88	2.1482	22 52 43.6	8.344
12	6 9 6.29	2.2459	27 8 58.0	2.384	12	7 54 59.68	2.1451	22 44 19.6	8.457
13	6 11 21.03	2.2453	27 6 30.9	2.520	13	7 57 8.29	2.1418	22 35 48.8	8.569
14	6 13 35.73	2.2447	27 3 55.6	2.656	14	7 59 16.70	2.1387	22 27 11.3	8.681
15	6 15 50.39	2.2439	27 1 12.2	2.790	15	8 1 24.93	2.1355	22 18 27.1	8.792
16	6 18 5.00	2.2431	26 58 20.8	2.925	16	8 3 32.96	2.1323	22 9 36.3	8.901
17	6 20 19.56	2.2422	26 55 21.2	3.060	17	8 5 40.80	2.1291	22 0 39.0	9.010
18	6 22 34.06	2.2412	26 52 13.6	3.193	18	8 7 48.45	2.1258	21 51 35.1	9.119
19	6 24 48.50	2.2401	26 48 58.0	3.328	19	8 9 55.90	2.1225	21 42 24.7	9.227
20	6 27 2.87	2.2390	26 45 34.3	3.463	20	8 12 3.15	2.1193	21 33 7.9	9.333
21	6 29 17.18	2.2378	26 42 2.5	3.596	21	8 14 10.21	2.1160	21 23 44.8	9.438
22	6 31 31.41	2.2365	26 38 22.8	3.729	22	8 16 17.07	2.1128	21 14 15.3	9.543
23	6 33 45.56	2.2351	26 34 35.0	3.863	23	8 18 23.74	2.1095	21 4 39.6	9.648
24	6 35 59.62	2.2337	N. 26 30 39.3	3.995	24	8 20 30.21	2.1062	N. 20 54 57.6	9.751

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.				Diff. for 1 Min.
TUESDAY 13.									
	h	m	s	s		°	′	″	″
0	8	20	30.21	2.1062	N.	20	54	57.6	9.751
1	8	22	36.48	2.1029		20	45	9.5	9.853
2	8	24	42.56	2.0997		20	35	15.2	9.956
3	8	26	48.44	2.0963		20	25	14.8	10.057
4	8	28	54.12	2.0931		20	15	8.4	10.157
5	8	30	59.61	2.0898		20	4	56.0	10.256
6	8	33	4.90	2.0866		19	54	37.7	10.354
7	8	35	10.00	2.0833		19	44	13.5	10.452
8	8	37	14.90	2.0801		19	33	43.5	10.548
9	8	39	19.61	2.0769		19	23	7.8	10.643
10	8	41	24.13	2.0737		19	12	26.3	10.739
11	8	43	28.45	2.0704		19	1	39.1	10.833
12	8	45	32.58	2.0673		18	50	46.4	10.925
13	8	47	36.52	2.0641		18	39	48.1	11.018
14	8	49	40.27	2.0609		18	28	44.3	11.109
15	8	51	43.83	2.0578		18	17	35.0	11.200
16	8	53	47.20	2.0547		18	6	20.3	11.289
17	8	55	50.39	2.0516		17	55	0.3	11.378
18	8	57	53.39	2.0485		17	43	35.0	11.466
19	8	59	56.21	2.0455		17	32	4.4	11.553
20	9	1	58.85	2.0425		17	20	28.7	11.638
21	9	4	1.31	2.0395		17	8	47.9	11.723
22	9	6	3.59	2.0365		16	57	2.0	11.807
23	9	8	5.69	2.0335	N.	16	45	11.1	11.889
WEDNESDAY 14.									
0	9	10	7.61	2.0306	N.	16	33	15.3	11.971
1	9	12	9.36	2.0278		16	21	14.6	12.053
2	9	14	10.94	2.0249		16	9	9.0	12.133
3	9	16	12.35	2.0221		15	56	58.6	12.213
4	9	18	13.59	2.0193		15	44	43.4	12.292
5	9	20	14.67	2.0166		15	32	23.6	12.368
6	9	22	15.58	2.0138		15	19	59.2	12.444
7	9	24	16.33	2.0113		15	7	30.3	12.520
8	9	26	16.93	2.0087		14	54	56.8	12.596
9	9	28	17.37	2.0060		14	42	18.8	12.669
10	9	30	17.65	2.0034		14	29	36.5	12.742
11	9	32	17.78	2.0010		14	16	49.8	12.813
12	9	34	17.77	1.9986		14	3	58.9	12.884
13	9	36	17.61	1.9961		13	51	3.7	12.954
14	9	38	17.30	1.9938		13	38	4.4	13.023
15	9	40	16.86	1.9915		13	25	1.0	13.091
16	9	42	16.28	1.9893		13	11	53.5	13.158
17	9	44	15.57	1.9870		12	58	42.0	13.224
18	9	46	14.72	1.9848		12	45	26.6	13.289
19	9	48	13.75	1.9828		12	32	7.3	13.353
20	9	50	12.65	1.9807		12	18	44.2	13.417
21	9	52	11.43	1.9787		12	5	17.3	13.479
22	9	54	10.09	1.9768		11	51	46.7	13.540
23	9	56	8.64	1.9748		11	38	12.5	13.601
24	9	58	7.07	1.9729	N.	11	24	34.6	13.661

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.				Diff. for 1 Min.
THURSDAY 15.									
	h	m	s	s		°	′	″	″
0	9	58	7.07	1.9729	N.	11	24	34.6	13.661
1	10	0	5.39	1.9712		11	10	53.2	13.718
2	10	2	3.61	1.9695		10	57	8.4	13.776
3	10	4	1.73	1.9678		10	43	20.1	13.833
4	10	5	59.75	1.9662		10	29	28.5	13.888
5	10	7	57.67	1.9646		10	15	33.6	13.943
6	10	9	55.50	1.9632		10	1	35.4	13.997
7	10	11	53.25	1.9618		9	47	34.0	14.049
8	10	13	50.91	1.9603		9	33	29.5	14.101
9	10	15	48.49	1.9590		9	19	21.9	14.152
10	10	17	45.99	1.9578		9	5	11.3	14.201
11	10	19	43.42	1.9566		8	50	57.8	14.249
12	10	21	40.78	1.9555		8	36	41.4	14.298
13	10	23	38.08	1.9544		8	22	22.1	14.344
14	10	25	35.31	1.9534		8	8	0.1	14.390
15	10	27	32.49	1.9525		7	53	35.3	14.435
16	10	29	29.61	1.9516		7	39	7.9	14.478
17	10	31	26.68	1.9508		7	24	37.9	14.522
18	10	33	23.71	1.9502		7	10	5.3	14.564
19	10	35	20.70	1.9495		6	55	30.2	14.605
20	10	37	17.65	1.9489		6	40	52.7	14.644
21	10	39	14.57	1.9483		6	26	12.9	14.683
22	10	41	11.45	1.9478		6	11	30.8	14.721
23	10	43	8.31	1.9476	N.	5	56	46.4	14.758
FRIDAY 16.									
0	10	45	5.16	1.9473	N.	5	41	59.9	14.793
1	10	47	1.99	1.9471		5	27	11.2	14.828
2	10	48	58.81	1.9469		5	12	20.5	14.862
3	10	50	55.62	1.9468		4	57	27.8	14.895
4	10	52	52.43	1.9468		4	42	33.1	14.928
5	10	54	49.24	1.9468		4	27	36.5	14.958
6	10	56	46.05	1.9470		4	12	38.1	14.988
7	10	58	42.88	1.9473		3	57	38.0	15.017
8	11	0	39.73	1.9476		3	42	36.1	15.045
9	11	2	36.59	1.9479		3	27	32.6	15.072
10	11	4	33.48	1.9484		3	12	27.5	15.098
11	11	6	30.40	1.9489		2	57	20.9	15.123
12	11	8	27.35	1.9495		2	42	12.8	15.146
13	11	10	24.34	1.9503		2	27	3.4	15.168
14	11	12	21.38	1.9510		2	11	52.6	15.190
15	11	14	18.46	1.9518		1	56	40.6	15.211
16	11	16	15.60	1.9528		1	41	27.3	15.231
17	11	18	12.79	1.9538		1	26	12.9	15.249
18	11	20	10.05	1.9548		1	10	57.4	15.267
19	11	22	7.37	1.9560		0	55	40.9	15.283
20	11	24	4.77	1.9573		0	40	23.5	15.298
21	11	26	2.25	1.9587		0	25	5.2	15.313
22	11	27	59.81	1.9600	N.	0	9	46.0	15.326
23	11	29	57.45	1.9615	S.	0	5	33.9	15.338
24	11	31	55.19	1.9632	S.	0	20	54.5	15.348

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SATURDAY 17.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	11 31 55.19	1.9632	S. 0 20 54.5	15.348
1	11 33 53.03	1.9648	0 36 15.7	15.358
2	11 35 50.97	1.9665	0 51 37.5	15.367
3	11 37 49.01	1.9683	1 6 59.7	15.374
4	11 39 47.17	1.9703	1 22 22.4	15.382
5	11 41 45.44	1.9723	1 37 45.5	15.387
6	11 43 43.84	1.9744	1 53 8.8	15.391
7	11 45 42.37	1.9766	2 8 32.4	15.394
8	11 47 41.03	1.9788	2 23 56.1	15.396
9	11 49 39.83	1.9812	2 39 19.9	15.398
10	11 51 38.77	1.9836	2 54 43.8	15.398
11	11 53 37.86	1.9861	3 10 7.6	15.396
12	11 55 37.10	1.9887	3 25 31.3	15.393
13	11 57 36.50	1.9914	3 40 54.8	15.389
14	11 59 36.07	1.9942	3 56 18.0	15.384
15	12 1 35.80	1.9970	4 11 40.9	15.378
16	12 3 35.71	2.0000	4 27 3.4	15.371
17	12 5 35.80	2.0030	4 42 25.4	15.363
18	12 7 36.07	2.0062	4 57 46.9	15.353
19	12 9 36.54	2.0094	5 13 7.7	15.342
20	12 11 37.20	2.0127	5 28 27.9	15.330
21	12 13 38.06	2.0161	5 43 47.3	15.317
22	12 15 39.13	2.0196	5 59 5.9	15.303
23	12 17 40.41	2.0232	S. 6 14 23.6	15.287

SUNDAY 18.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	12 19 41.91	2.0268	S. 6 29 40.3	15.269
1	12 21 43.63	2.0305	6 44 55.9	15.251
2	12 23 45.57	2.0343	7 0 10.4	15.232
3	12 25 47.75	2.0383	7 15 23.7	15.210
4	12 27 50.16	2.0423	7 30 35.6	15.188
5	12 29 52.82	2.0463	7 45 46.2	15.164
6	12 31 55.72	2.0505	8 0 55.3	15.139
7	12 33 58.88	2.0548	8 16 2.9	15.113
8	12 36 2.30	2.0592	8 31 8.9	15.086
9	12 38 5.98	2.0636	8 46 13.2	15.057
10	12 40 9.93	2.0682	9 1 15.7	15.027
11	12 42 14.16	2.0728	9 16 16.4	14.996
12	12 44 18.67	2.0775	9 31 15.2	14.963
13	12 46 23.46	2.0823	9 46 11.9	14.928
14	12 48 28.54	2.0872	10 1 6.5	14.893
15	12 50 33.92	2.0922	10 15 59.0	14.855
16	12 52 39.60	2.0972	10 30 49.1	14.816
17	12 54 45.58	2.1023	10 45 36.9	14.777
18	12 56 51.87	2.1075	11 0 22.3	14.736
19	12 58 58.48	2.1128	11 15 5.2	14.693
20	13 1 5.41	2.1183	11 29 45.4	14.648
21	13 3 12.67	2.1238	11 44 22.9	14.602
22	13 5 20.26	2.1293	11 58 57.6	14.554
23	13 7 28.19	2.1349	12 13 29.4	14.506
24	13 9 36.45	2.1406	S. 12 27 58.3	14.456

MONDAY 19.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	13 9 36.45	2.1406	S. 12 27 58.3	14.456
1	13 11 45.06	2.1464	12 42 24.1	14.404
2	13 13 54.02	2.1523	12 56 46.7	14.350
3	13 16 3.34	2.1583	13 11 6.1	14.295
4	13 18 13.02	2.1643	13 25 22.1	14.238
5	13 20 23.06	2.1704	13 39 34.7	14.180
6	13 22 33.47	2.1767	13 53 43.7	14.120
7	13 24 44.26	2.1830	14 7 49.1	14.059
8	13 26 55.43	2.1893	14 21 50.8	13.996
9	13 29 6.98	2.1958	14 35 48.6	13.931
10	13 31 18.92	2.2023	14 49 42.5	13.865
11	13 33 31.25	2.2088	15 3 32.4	13.798
12	13 35 43.97	2.2153	15 17 18.2	13.728
13	13 37 57.09	2.2221	15 30 59.8	13.657
14	13 40 10.62	2.2289	15 44 37.0	13.583
15	13 42 24.56	2.2358	15 58 9.8	13.509
16	13 44 38.91	2.2426	16 11 38.1	13.433
17	13 46 53.67	2.2496	16 25 1.7	13.354
18	13 49 8.86	2.2567	16 38 20.6	13.275
19	13 51 24.47	2.2637	16 51 34.7	13.194
20	13 53 40.50	2.2708	17 4 43.9	13.111
21	13 55 56.97	2.2781	17 17 48.0	13.025
22	13 58 13.87	2.2853	17 30 46.9	12.938
23	14 0 31.20	2.2926	S. 17 43 40.6	12.850

TUESDAY 20.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	14 2 48.98	2.3000	S. 17 56 28.9	12.759
1	14 5 7.20	2.3073	18 9 11.7	12.668
2	14 7 25.86	2.3148	18 21 49.0	12.574
3	14 9 44.97	2.3223	18 34 20.6	12.478
4	14 12 4.54	2.3299	18 46 46.4	12.381
5	14 14 24.56	2.3374	18 59 6.3	12.282
6	14 16 45.03	2.3450	19 11 20.2	12.180
7	14 19 5.96	2.3527	19 23 27.9	12.077
8	14 21 27.35	2.3604	19 35 29.4	11.973
9	14 23 49.21	2.3682	19 47 24.6	11.866
10	14 26 11.53	2.3758	19 59 13.3	11.758
11	14 28 34.31	2.3836	20 10 55.5	11.647
12	14 30 57.56	2.3914	20 22 30.9	11.534
13	14 33 21.28	2.3993	20 33 59.6	11.420
14	14 35 45.47	2.4071	20 45 21.3	11.303
15	14 38 10.13	2.4149	20 56 36.0	11.186
16	14 40 35.26	2.4228	21 7 43.6	11.066
17	14 43 0.86	2.4306	21 18 43.9	10.944
18	14 45 26.93	2.4384	21 29 36.9	10.821
19	14 47 53.47	2.4463	21 40 22.4	10.695
20	14 50 20.49	2.4543	21 51 0.3	10.567
21	14 52 47.98	2.4620	22 1 30.4	10.438
22	14 55 15.93	2.4698	22 11 52.8	10.307
23	14 57 44.36	2.4777	22 22 7.2	10.173
24	15 0 13.25	2.4855	S. 22 32 13.6	10.038

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 21.					FRIDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 0 13.25	2.4855	S. 22 32 13.6	10.038	0	17 7 13.40	2.7604	S. 27 25 33.1	1.628
1	15 2 42.62	2.4933	22 42 11.8	9.902	1	17 9 59.09	2.7625	27 27 4.7	1.424
2	15 5 12.45	2.5011	22 52 1.8	9.763	2	17 12 44.90	2.7643	27 28 24.0	1.219
3	15 7 42.75	2.5088	23 1 43.3	9.622	3	17 15 30.81	2.7659	27 29 31.0	1.014
4	15 10 13.51	2.5165	23 11 16.4	9.479	4	17 18 16.81	2.7673	27 30 25.7	0.810
5	15 12 44.73	2.5242	23 20 40.8	9.334	5	17 21 2.89	2.7686	27 31 8.2	0.605
6	15 15 16.41	2.5318	23 29 56.5	9.188	6	17 23 49.04	2.7696	27 31 38.3	0.398
7	15 17 48.55	2.5394	23 39 3.4	9.040	7	17 26 35.24	2.7704	27 31 56.0	−0.193
8	15 20 21.14	2.5470	23 48 1.3	8.890	8	17 29 21.49	2.7711	27 32 1.4	+0.013
9	15 22 54.19	2.5545	23 56 50.2	8.738	9	17 32 7.77	2.7714	27 31 54.5	0.218
10	15 25 27.68	2.5618	24 5 29.9	8.584	10	17 34 54.06	2.7716	27 31 35.2	0.425
11	15 28 1.61	2.5692	24 14 0.3	8.429	11	17 37 40.36	2.7716	27 31 3.5	0.632
12	15 30 35.98	2.5765	24 22 21.4	8.272	12	17 40 26.65	2.7713	27 30 19.4	0.838
13	15 33 10.79	2.5838	24 30 32.9	8.113	13	17 43 12.92	2.7709	27 29 23.0	1.043
14	15 35 46.03	2.5909	24 38 34.9	7.953	14	17 45 59.16	2.7703	27 28 14.2	1.250
15	15 38 21.70	2.5980	24 46 27.2	7.790	15	17 48 45.36	2.7694	27 26 53.0	1.456
16	15 40 57.79	2.6049	24 54 9.7	7.625	16	17 51 31.49	2.7683	27 25 19.5	1.661
17	15 43 34.29	2.6118	25 1 42.2	7.459	17	17 54 17.55	2.7670	27 23 33.7	1.866
18	15 46 11.21	2.6187	25 9 4.8	7.293	18	17 57 3.53	2.7655	27 21 35.6	2.071
19	15 48 48.53	2.6253	25 16 17.3	7.123	19	17 59 49.41	2.7638	27 19 25.2	2.275
20	15 51 26.25	2.6320	25 23 19.5	6.953	20	18 2 35.19	2.7620	27 17 2.6	2.478
21	15 54 4.37	2.6386	25 30 11.5	6.780	21	18 5 20.85	2.7598	27 14 27.8	2.682
22	15 56 42.88	2.6449	25 36 53.1	6.606	22	18 8 6.37	2.7575	27 11 40.8	2.884
23	15 59 21.76	2.6512	S. 25 43 24.2	6.430	23	18 10 51.75	2.7551	S. 27 8 41.7	3.087
	THURSDAY 22.					SATURDAY 24.			
0	16 2 1.02	2.6574	S. 25 49 44.7	6.253	0	18 13 36.98	2.7523	S. 27 5 30.4	3.288
1	16 4 40.65	2.6635	25 55 54.5	6.074	1	18 16 22.03	2.7494	27 2 7.1	3.489
2	16 7 20.64	2.6694	26 1 53.6	5.894	2	18 19 6.91	2.7464	26 58 31.7	3.690
3	16 10 0.98	2.6752	26 7 41.8	5.712	3	18 21 51.60	2.7431	26 54 44.3	3.888
4	16 12 41.66	2.6808	26 13 19.0	5.529	4	18 24 36.08	2.7396	26 50 45.1	4.086
5	16 15 22.68	2.6864	26 18 45.3	5.345	5	18 27 20.35	2.7359	26 46 34.0	4.283
6	16 18 4.03	2.6918	26 24 0.4	5.158	6	18 30 4.39	2.7321	26 42 11.1	4.480
7	16 20 45.70	2.6970	26 29 4.3	4.972	7	18 32 48.20	2.7282	26 37 36.4	4.675
8	16 23 27.67	2.7021	26 33 57.0	4.783	8	18 35 31.77	2.7240	26 32 50.1	4.868
9	16 26 9.95	2.7071	26 38 38.3	4.593	9	18 38 15.08	2.7196	26 27 52.2	5.062
10	16 28 52.52	2.7118	26 43 8.2	4.403	10	18 40 58.12	2.7150	26 22 42.7	5.254
11	16 31 35.37	2.7164	26 47 26.7	4.212	11	18 43 40.88	2.7103	26 17 21.7	5.444
12	16 34 18.49	2.7209	26 51 33.6	4.018	12	18 46 23.36	2.7055	26 11 49.4	5.633
13	16 37 1.88	2.7253	26 55 28.8	3.823	13	18 49 5.54	2.7004	26 6 5.7	5.822
14	16 39 45.52	2.7293	26 59 12.4	3.628	14	18 51 47.41	2.6953	26 0 10.8	6.008
15	16 42 29.40	2.7333	27 2 44.2	3.432	15	18 54 28.97	2.6900	25 54 4.8	6.193
16	16 45 13.51	2.7370	27 6 4.2	3.235	16	18 57 10.21	2.6845	25 47 47.6	6.378
17	16 47 57.84	2.7406	27 9 12.4	3.037	17	18 59 51.11	2.6788	25 41 19.5	6.559
18	16 50 42.38	2.7440	27 12 8.6	2.838	18	19 2 31.67	2.6731	25 34 40.5	6.740
19	16 53 27.12	2.7473	27 14 52.9	2.638	19	19 5 11.88	2.6672	25 27 50.7	6.919
20	16 56 12.05	2.7503	27 17 25.1	2.437	20	19 7 51.73	2.6612	25 20 50.2	7.098
21	16 58 57.15	2.7531	27 19 45.3	2.236	21	19 10 31.22	2.6551	25 13 39.0	7.274
22	17 1 42.42	2.7558	27 21 53.4	2.034	22	19 13 10.34	2.6488	25 6 17.3	7.448
23	17 4 27.84	2.7582	27 23 49.4	1.831	23	19 15 49.07	2.6423	24 58 45.2	7.622
24	17 7 13.40	2.7604	S. 27 25 33.1	1.628	24	19 18 27.42	2.6358	S. 24 51 2.7	7.793

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 25.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	19 18 27.42	2.6358	S. 24 51 2.7	7.793
1	19 21 5.37	2.6292	24 43 10.0	7.963
2	19 23 42.92	2.6225	24 35 7.2	8.130
3	19 26 20.07	2.6157	24 26 54.4	8.297
4	19 28 56.80	2.6087	24 18 31.6	8.461
5	19 31 33.11	2.6017	24 9 59.1	8.623
6	19 34 9.00	2.5946	24 1 16.8	8.784
7	19 36 44.46	2.5874	23 52 25.0	8.943
8	19 39 19.49	2.5802	23 43 23.7	9.099
9	19 41 54.08	2.5728	23 34 13.1	9.254
10	19 44 28.22	2.5653	23 24 53.2	9.408
11	19 47 1.92	2.5578	23 15 24.1	9.559
12	19 49 35.16	2.5502	23 5 46.1	9.708
13	19 52 7.94	2.5426	22 55 59.2	9.855
14	19 54 40.27	2.5350	22 46 3.5	10.001
15	19 57 12.14	2.5273	22 35 59.1	10.144
16	19 59 43.54	2.5194	22 25 46.2	10.285
17	20 2 14.47	2.5116	22 15 24.9	10.424
18	20 4 44.93	2.5038	22 4 55.3	10.561
19	20 7 14.92	2.4958	21 54 17.6	10.696
20	20 9 44.43	2.4879	21 43 31.8	10.830
21	20 12 13.47	2.4800	21 32 38.0	10.961
22	20 14 42.03	2.4720	21 21 36.5	11.089
23	20 17 10.11	2.4640	S. 21 10 27.3	11.217

MONDAY 26.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	20 19 37.71	2.4560	S. 20 59 10.5	11.342
1	20 22 4.83	2.4479	20 47 46.3	11.464
2	20 24 31.46	2.4399	20 36 14.8	11.585
3	20 26 57.62	2.4319	20 24 36.1	11.703
4	20 29 23.29	2.4238	20 12 50.4	11.819
5	20 31 48.48	2.4158	20 0 57.8	11.934
6	20 34 13.19	2.4078	19 48 58.3	12.047
7	20 36 37.41	2.3997	19 36 52.2	12.157
8	20 39 1.15	2.3917	19 24 39.5	12.265
9	20 41 24.41	2.3837	19 12 20.4	12.371
10	20 43 47.19	2.3757	18 59 55.0	12.475
11	20 46 9.49	2.3678	18 47 23.4	12.578
12	20 48 31.32	2.3598	18 34 45.7	12.678
13	20 50 52.66	2.3518	18 22 2.1	12.775
14	20 53 13.53	2.3439	18 9 12.7	12.871
15	20 55 33.93	2.3361	17 56 17.6	12.965
16	20 57 53.86	2.3283	17 43 16.9	13.057
17	21 0 13.32	2.3204	17 30 10.8	13.146
18	21 2 32.31	2.3126	17 16 59.4	13.234
19	21 4 50.83	2.3048	17 3 42.7	13.320
20	21 7 8.89	2.2972	16 50 21.0	13.403
21	21 9 26.49	2.2895	16 36 54.3	13.485
22	21 11 43.63	2.2819	16 23 22.8	13.565
23	21 14 0.32	2.2743	16 9 46.5	13.643
24	21 16 16.55	2.2668	S. 15 56 5.6	13.719

TUESDAY 27.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	21 16 16.55	2.2668	S. 15 56 5.6	13.719
1	21 18 32.33	2.2593	15 42 20.2	13.793
2	21 20 47.67	2.2520	15 28 30.5	13.864
3	21 23 2.57	2.2447	15 14 36.5	13.935
4	21 25 17.03	2.2373	15 0 38.3	14.003
5	21 27 31.05	2.2301	14 46 36.1	14.069
6	21 29 44.64	2.2229	14 32 30.0	14.133
7	21 31 57.80	2.2158	14 18 20.1	14.196
8	21 34 10.54	2.2088	14 4 6.5	14.257
9	21 36 22.85	2.2018	13 49 49.3	14.316
10	21 38 34.75	2.1948	13 35 28.6	14.373
11	21 40 46.23	2.1880	13 21 4.5	14.428
12	21 42 57.31	2.1813	13 6 37.2	14.481
13	21 45 7.98	2.1745	12 52 6.8	14.533
14	21 47 18.25	2.1679	12 37 33.3	14.583
15	21 49 28.13	2.1613	12 22 56.9	14.631
16	21 51 37.61	2.1548	12 8 17.6	14.678
17	21 53 46.70	2.1483	11 53 35.6	14.722
18	21 55 55.41	2.1420	11 38 51.0	14.764
19	21 58 3.74	2.1358	11 24 3.9	14.806
20	22 0 11.70	2.1296	11 9 14.3	14.846
21	22 2 19.29	2.1234	10 54 22.4	14.883
22	22 4 26.51	2.1173	10 39 28.3	14.919
23	22 6 33.37	2.1114	S. 10 24 32.1	14.954

WEDNESDAY 28.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	22 8 39.88	2.1055	S. 10 9 33.8	14.988
1	22 10 46.03	2.0997	9 54 33.6	15.019
2	22 12 51.84	2.0940	9 39 31.5	15.049
3	22 14 57.31	2.0883	9 24 27.7	15.077
4	22 17 2.44	2.0828	9 9 22.3	15.103
5	22 19 7.24	2.0773	8 54 15.3	15.129
6	22 21 11.71	2.0718	8 39 6.8	15.153
7	22 23 15.86	2.0666	8 23 56.9	15.176
8	22 25 19.70	2.0613	8 8 45.7	15.196
9	22 27 23.22	2.0561	7 53 33.4	15.215
10	22 29 26.43	2.0510	7 38 19.9	15.233
11	22 31 29.34	2.0461	7 23 5.4	15.249
12	22 33 31.96	2.0412	7 7 50.0	15.264
13	22 35 34.28	2.0363	6 52 33.7	15.278
14	22 37 36.32	2.0316	6 37 16.7	15.289
15	22 39 38.07	2.0269	6 21 59.0	15.301
16	22 41 39.55	2.0223	6 6 40.6	15.311
17	22 43 40.75	2.0178	5 51 21.7	15.318
18	22 45 41.69	2.0135	5 36 2.4	15.324
19	22 47 42.37	2.0092	5 20 42.8	15.330
20	22 49 42.79	2.0049	5 5 22.8	15.335
21	22 51 42.96	2.0008	4 50 2.6	15.338
22	22 53 42.89	1.9968	4 34 42.3	15.339
23	22 55 42.57	1.9928	4 19 21.9	15.339
24	22 57 42.02	1.9889	S. 4 4 1.6	15.338

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 29.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	22 57 42.02	1.9889	S. 4 4 1.6	15.338
1	22 59 41.24	1.9851	3 48 41.4	15.336
2	23 1 40.23	1.9813	3 33 21.3	15.333
3	23 3 39.00	1.9777	3 18 1.4	15.328
4	23 5 37.55	1.9741	3 2 41.9	15.323
5	23 7 35.89	1.9707	2 47 22.7	15.316
6	23 9 34.03	1.9673	2 32 4.0	15.308
7	23 11 31.97	1.9640	2 16 45.8	15.298
8	23 13 29.71	1.9608	2 1 28.2	15.288
9	23 15 27.26	1.9577	1 46 11.3	15.276
10	23 17 24.63	1.9546	1 30 55.1	15.263
11	23 19 21.81	1.9516	1 15 39.7	15.249
12	23 21 18.82	1.9488	1 0 25.2	15.234
13	23 23 15.66	1.9460	0 45 11.6	15.219
14	23 25 12.34	1.9433	0 29 58.9	15.203
15	23 27 8.85	1.9406	S. 0 14 47.3	15.183
16	23 29 5.21	1.9381	N. 0 0 23.1	15.164
17	23 31 1.42	1.9356	0 15 32.4	15.145
18	23 32 57.48	1.9332	0 30 40.5	15.124
19	23 34 53.40	1.9309	0 45 47.3	15.102
20	23 36 49.19	1.9288	1 0 52.7	15.078
21	23 38 44.85	1.9266	1 15 56.7	15.055
22	23 40 40.38	1.9245	1 30 59.3	15.030
23	23 42 35.79	1.9225	N. 1 46 0.3	15.003

FRIDAY 30.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	23 44 31.08	1.9206	N. 2 0 59.7	14.977
1	23 46 26.26	1.9188	2 15 57.5	14.948
2	23 48 21.34	1.9171	2 30 53.5	14.919
3	23 50 16.31	1.9154	2 45 47.8	14.889
4	23 52 11.19	1.9138	3 0 40.2	14.858
5	23 54 5.97	1.9123	3 15 30.8	14.828
6	23 56 0.67	1.9109	3 30 19.5	14.795
7	23 57 55.28	1.9095	3 45 6.2	14.761
8	23 59 49.81	1.9083	3 59 50.8	14.727
9	0 1 44.27	1.9071	4 14 33.4	14.692
10	0 3 38.66	1.9060	4 29 13.8	14.655
11	0 5 32.99	1.9050	4 43 52.0	14.618
12	0 7 27.26	1.9040	4 58 28.0	14.581
13	0 9 21.47	1.9031	5 13 1.7	14.542
14	0 11 15.63	1.9023	5 27 33.0	14.502
15	0 13 9.75	1.9017	5 42 1.9	14.462
16	0 15 3.83	1.9010	5 56 28.4	14.421
17	0 16 57.87	1.9003	6 10 52.4	14.379
18	0 18 51.87	1.8998	6 25 13.9	14.336
19	0 20 45.85	1.8994	6 39 32.7	14.292
20	0 22 39.80	1.8990	6 53 48.9	14.248
21	0 24 33.73	1.8988	7 8 2.4	14.203
22	0 26 27.65	1.8986	7 22 13.2	14.157
23	0 28 21.56	1.8984	7 36 21.2	14.110
24	0 30 15.46	1.8983	N. 7 50 26.4	14.063

SATURDAY 31.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	0 30 15.46	1.8983	N. 7 50 26.4	14.063
1	0 32 9.36	1.8983	8 4 28.7	14.014
2	0 34 3.26	1.8984	8 18 28.1	13.965
3	0 35 57.17	1.8985	8 32 24.5	13.915
4	0 37 51.08	1.8987	8 46 17.9	13.865
5	0 39 45.01	1.8990	9 0 8.3	13.813
6	0 41 38.96	1.8993	9 13 55.5	13.761
7	0 43 32.93	1.8998	9 27 39.6	13.708
8	0 45 26.93	1.9003	9 41 20.5	13.654
9	0 47 20.96	1.9008	9 54 58.1	13.600
10	0 49 15.03	1.9014	10 8 32.5	13.545
11	0 51 9.13	1.9021	10 22 3.5	13.489
12	0 53 3.28	1.9029	10 35 31.2	13.433
13	0 54 57.48	1.9037	10 48 55.5	13.376
14	0 56 51.72	1.9045	11 2 16.3	13.318
15	0 58 46.02	1.9055	11 15 33.6	13.258
16	1 0 40.38	1.9065	11 28 47.3	13.199
17	1 2 34.80	1.9076	11 41 57.5	13.139
18	1 4 29.29	1.9087	11 55 4.0	13.078
19	1 6 23.84	1.9098	12 8 6.9	13.017
20	1 8 18.47	1.9112	12 21 6.0	12.954
21	1 10 13.18	1.9124	12 34 1.4	12.892
22	1 12 7.96	1.9138	12 46 53.0	12.828
23	1 14 2.83	1.9153	N. 12 59 40.8	12.763

SUNDAY, AUGUST 1.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	1 15 57.79	1.9168	N. 13 12 24.6	12.698

PHASES OF THE MOON.

			d h m
☾	Last Quarter	July	3 17 54.2
●	New Moon		11 21 30.8
☽	First Quarter		19 9 8.8
○	Full Moon		26 0 11.0

			d h
☾	Apogee	July	7 22.8
☾	Perigee		23 17.4

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Added to Apparent Time.	Diff. for 1 Hour
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
SUN.	1	8 42 16.66	9.728	N.18 14 20.9	−37.14	15 47.36	66.68	6 12.48	0.127
Mon.	2	8 46 9.85	9.704	17 59 20.7	37.88	15 47.48	66.59	6 9.12	0.152
Tues.	3	8 50 2.45	9.680	17 44 2.7	38.61	15 47.60	66.51	6 5.18	0.176
Wed.	4	8 53 54.47	9.655	17 28 27.4	−39.33	15 47.72	66.42	6 0.65	0.201
Thur.	5	8 57 45.90	9.631	17 12 34.9	40.04	15 47.85	66.33	5 55.54	0.225
Fri.	6	9 1 36.74	9.606	16 56 25.6	40.73	15 47.99	66.24	5 49.84	0.250
Sat.	7	9 5 26.99	9.582	16 39 59.7	−41.41	15 48.13	66.15	5 43.55	0.274
SUN.	8	9 9 16.66	9.557	16 23 17.7	42.08	15 48.27	66.07	5 36.68	0.298
Mon.	9	9 13 5.75	9.533	16 6 19.7	42.74	15 48.42	65.98	5 29.24	0.322
Tues.	10	9 16 54.25	9.509	15 49 6.2	−43.38	15 48.57	65.90	5 21.21	0.346
Wed.	11	9 20 42.18	9.485	15 31 37.4	44.01	15 48.72	65.81	5 12.60	0.370
Thur.	12	9 24 29.53	9.461	15 13 53.7	44.62	15 48.88	65.73	5 3.43	0.394
Fri.	13	9 28 16.31	9.437	14 55 55.4	−45.22	15 49.05	65.65	4 53.68	0.418
Sat.	14	9 32 2.53	9.414	14 37 42.9	45.81	15 49.23	65.57	4 43.37	0.441
SUN.	15	9 35 48.18	9.391	14 19 16.5	46.38	15 49.41	65.49	4 32.49	0.465
Mon.	16	9 39 33.28	9.368	14 0 36.6	−46.94	15 49.59	65.42	4 21.07	0.488
Tues.	17	9 43 17.83	9.345	13 41 43.3	47.49	15 49.78	65.34	4 9.09	0.510
Wed.	18	9 47 1.84	9.323	13 22 37.2	48.02	15 49.97	65.27	3 56.58	0.532
Thur.	19	9 50 45.32	9.301	13 3 18.4	−48.54	15 50.16	65.19	3 43.54	0.554
Fri.	20	9 54 28.28	9.280	12 43 47.4	49.04	15 50.35	65.12	3 29.99	0.575
Sat.	21	9 58 10.75	9.259	12 24 4.4	49.54	15 50.55	65.05	3 15.94	0.596
SUN.	22	10 1 52.72	9.239	12 4 9.7	−50.02	15 50.75	64.99	3 1.40	0.616
Mon.	23	10 5 34.22	9.220	11 44 3.6	50.49	15 50.95	64.92	2 46.39	0.635
Tues.	24	10 9 15.28	9.201	11 23 46.4	50.94	15 51.15	64.86	2 30.93	0.653
Wed.	25	10 12 55.89	9.183	11 3 18.4	−51.39	15 51.36	64.79	2 15.03	0.671
Thur.	26	10 16 36.09	9.166	10 42 39.9	51.82	15 51.57	64.73	1 58.71	0.688
Fri.	27	10 20 15.88	9.150	10 21 51.2	52.24	15 51.78	64.67	1 42.00	0.704
Sat.	28	10 23 55.29	9.135	10 0 52.4	−52.65	15 51.99	64.61	1 24.90	0.720
SUN.	29	10 27 34.34	9.120	9 39 44.1	53.04	15 52.20	64.55	1 7.45	0.735
Mon.	30	10 31 13.05	9.106	9 18 26.4	53.42	15 52.41	64.50	0 49.65	0.749
Tues.	31	10 34 51.42	9.092	8 56 59.7	53.79	15 52.63	64.45	0 31.52	0.762
Wed.	32	10 38 29.48	9.079	N. 8 35 24.3	−54.15	15 52.85	64.40	0 13.07	0.775

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting 0ˢ.19 from the sidereal time.

The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
SUN.	1	8 42 15.65	9.729	N.18 14 24.8	−37.14	6 12.49	0.127	8 36 3.16
Mon.	2	8 46 8.85	9.705	17 59 24.6	37.88	6 9.14	0.152	8 39 59.72
Tues.	3	8 50 1.47	9.680	17 44 6.6	38.61	6 5.20	0.176	8 43 56.27
Wed.	4	8 53 53.50	9.656	17 28 31.3	−39.33	6 0.67	0.201	8 47 52.83
Thur.	5	8 57 44.94	9.631	17 12 38.8	40.04	5 55.56	0.225	8 51 49.38
Fri.	6	9 1 35.80	9.607	16 56 29.5	40.73	5 49.86	0.250	8 55 45.94
Sat.	7	9 5 26.07	9.583	16 40 3.7	−41.41	5 43.58	0.274	8 59 42.50
SUN.	8	9 9 15.76	9.558	16 23 21.6	42.08	5 36.71	0.298	9 3 39.05
Mon.	9	9 13 4.87	9.534	16 6 23.6	42.74	5 29.27	0.322	9 7 35.61
Tues.	10	9 16 53.40	9.510	15 49 10.0	−43.38	5 21.24	0.346	9 11 32.16
Wed.	11	9 20 41.35	9.486	15 31 41.2	44.01	5 12.63	0.370	9 15 28.72
Thur.	12	9 24 28.74	9.462	15 13 57.5	44.63	5 3.46	0.394	9 19 25.28
Fri.	13	9 28 15.54	9.439	14 55 59.1	−45.23	4 53.71	0.418	9 23 21.83
Sat.	14	9 32 1.79	9.415	14 37 46.5	45.81	4 43.40	0.441	9 27 18.39
SUN.	15	9 35 47.47	9.392	14 19 20.0	46.38	4 32.53	0.465	9 31 14.94
Mon.	16	9 39 32.60	9.369	14 0 40.0	−46.94	4 21.10	0.488	9 35 11.50
Tues.	17	9 43 17.18	9.346	13 41 46.6	47.49	4 9.13	0.510	9 39 8.05
Wed.	18	9 47 1.22	9.324	13 22 40.3	48.02	3 56.62	0.532	9 43 4.61
Thur.	19	9 50 44.74	9.302	13 3 21.4	−48.54	3 43.58	0.554	9 47 1.16
Fri.	20	9 54 27.74	9.281	12 43 50.3	49.05	3 30.02	0.575	9 50 57.72
Sat.	21	9 58 10.24	9.261	12 24 7.1	49.54	3 15.97	0.596	9 54 54.27
SUN.	22	10 1 52.25	9.241	12 4 12.2	−50.02	3 1.43	0.616	9 58 50.83
Mon.	23	10 5 33.80	9.222	11 44 6.0	50.49	2 46.42	0.635	10 2 47.38
Tues.	24	10 9 14.89	9.204	11 23 48.6	50.95	2 30.95	0.653	10 6 43.94
Wed.	25	10 12 55.54	9.187	11 3 20.4	−51.40	2 15.05	0.671	10 10 40.49
Thur.	26	10 16 35.78	9.169	10 42 41.6	51.83	1 58.74	0.688	10 14 37.05
Fri.	27	10 20 15.62	9.152	10 21 52.6	52.24	1 42.02	0.704	10 18 33.60
Sat.	28	10 23 55.08	9.136	10 0 53.7	−52.64	1 24.92	0.720	10 22 30.16
SUN.	29	10 27 34.17	9.122	9 39 45.1	53.04	1 7.46	0.735	10 26 26.71
Mon.	30	10 31 12.92	9.108	9 18 27.1	53.43	0 49.66	0.749	10 30 23.26
Tues.	31	10 34 51.34	9.094	8 57 0.2	53.80	0 31.52	0.762	10 34 19.82
Wed.	32	10 38 29.45	9.081	N. 8 35 24.5	−54.16	0 13.08	0.775	10 38 16.37

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that north declinations are decreasing.

Diff. for 1 Hour,
$+9^{s}.8565$.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S				Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		True Longitude.		Diff. for 1 Hour.	Latitude.			
		λ	λ′					
		° ′ ″	′ ″	″	″			h m s
1	213	128 8 57.6	8 15.9	143.50	+0.58	0.006 4325	−22.0	15 21 25.47
2	214	129 6 22.0	5 40.2	143.54	0.63	0.006 3789	22.7	15 17 29.56
3	215	130 3 47.6	3 5.6	143.59	0.65	0.006 3236	23.5	15 13 33.65
4	216	131 1 14.4	0 32.2	143.64	+0.65	0.006 2663	−24.3	15 9 37.74
5	217	131 58 42.4	58 0.0	143.69	0.61	0.006 2071	25.1	15 5 41.83
6	218	132 56 11.5	55 29.1	143.74	0.55	0.006 1459	26.0	15 1 45.92
7	219	133 53 42.0	52 59.3	143.79	+0.46	0.006 0825	−26.9	14 57 50.01
8	220	134 51 13.6	50 30.8	143.84	0.35	0.006 0170	27.8	14 53 54.10
9	221	135 48 46.4	48 3.5	143.89	0.23	0.005 9493	28.7	14 49 58.19
10	222	136 46 20.4	45 37.4	143.94	+0.09	0.005 8793	−29.6	14 46 2.28
11	223	137 43 55.6	43 12.4	143.99	−0.05	0.005 8070	30.6	14 42 6.37
12	224	138 41 31.9	40 48.6	144.04	0.19	0.005 7325	31.5	14 38 10.46
13	225	139 39 9.3	38 25.9	144.08	−0.31	0.005 6557	−32.4	14 34 14.55
14	226	140 36 47.8	36 4.2	144.12	0.41	0.005 5768	33.3	14 30 18.64
15	227	141 34 27.3	33 43.5	144.17	0.50	0.005 4958	34.1	14 26 22.73
16	228	142 32 7.8	31 23.9	144.21	−0.55	0.005 4129	−34.9	14 22 26.82
17	229	143 29 49.3	29 5.3	144.25	0.57	0.005 3281	35.7	14 18 30.92
18	230	144 27 31.8	26 47.7	144.29	0.56	0.005 2417	36.4	14 14 35.01
19	231	145 25 15.4	24 31.1	144.34	−0.51	0.005 1538	−36.9	14 10 39.10
20	232	146 23 0.1	22 15.6	144.39	0.43	0.005 0647	37.4	14 6 43.19
21	233	147 20 45.8	20 1.3	144.44	0.33	0.004 9743	37.8	14 2 47.28
22	234	148 18 32.8	17 48.1	144.49	−0.21	0.004 8830	−38.2	13 58 51.37
23	235	149 16 21.0	15 36.2	144.54	−0.07	0.004 7908	38.6	13 54 55.46
24	236	150 14 10.6	13 25.7	144.60	+0.07	0.004 6977	38.9	13 50 59.55
25	237	151 12 1.7	11 16.6	144.66	+0.20	0.004 6040	−39.2	13 47 3.64
26	238	152 9 54.3	9 9.1	144.73	0.32	0.004 5094	39.6	13 43 7.73
27	239	153 7 48.5	7 3.2	144.80	0.42	0.004 4141	39.9	13 39 11.83
28	240	154 5 44.4	4 59.0	144.87	+0.49	0.004 3179	−40.2	13 35 15.92
29	241	155 3 42.2	2 56.6	144.94	0.54	0.004 2209	40.6	13 31 20.01
30	242	156 1 41.7	0 56.0	145.02	0.57	0.004 1230	41.0	13 27 24.10
31	243	156 59 43.1	58 57.3	145.10	0.58	0.004 0240	41.5	13 23 28.19
32	244	157 57 46.4	57 0.5	145.18	+0.55	0.003 9239	−42.0	13 19 32.28

NOTE.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,
$-9^{\mathrm{s}}.8296$.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″.	′ ″	″	h m	m	d
1	15 5.0	15 0.4	55 15.52	−1.488	54 58.79	−1.298	17 10.3	1.84	20.1
2	14 56.5	14 53.3	54 44.41	1.098	54 32.48	0.890	17 55.3	1.91	21.1
3	14 50.7	14 48.8	54 23.08	0.676	54 16.26	0.461	18 42.4	2.01	22.1
4	14 47.7	14 47.2	54 12.00	−0.250	54 10.24	−0.045	19 31.7	2.09	23.1
5	14 47.4	14 48.2	54 10.89	+0.152	54 13.86	+0.340	20 22.6	2.15	24.1
6	14 49.6	14 51.6	54 19.01	0.515	54 26.17	0.676	21 14.4	2.16	25.1
7	14 54.0	14 56.9	54 35.17	+0.821	54 45.81	+0.949	22 5.8	2.12	26.1
8	15 0.2	15 3.8	54 57.87	1.058	55 11.12	1.147	22 55.9	2.05	27.1
9	15 7.7	15 11.7	55 25.33	1.218	55 40.27	1.269	23 44.2	1.98	28.1
10	15 16.0	15 20.2	55 55.72	+1.303	56 11.48	+1.321	☌	. .	29.1
11	15 24.6	15 28.9	56 27.35	1.322	56 43.14	1.308	0 30.7	1.91	0.5
12	15 33.1	15 37.2	56 58.70	1.283	57 13.90	1.248	1 16.0	1.88	1.5
13	15 41.3	15 45.1	57 28.63	+1.205	57 42.80	+1.157	2 0.9	1.88	2.5
14	15 48.8	15 52.4	57 56.38	1.106	58 9.32	1.050	2 46.4	1.92	3.5
15	15 55.7	15 58.8	58 21.58	0.992	58 33.13	0.933	3 33.8	2.03	4.5
16	16 1.8	16 4.5	58 43.95	+0.869	58 53.97	+0.800	4 24.4	2.19	5.5
17	16 7.0	16 9.2	59 3.12	0.724	59 11.31	0.639	5 18.9	2.37	6.5
18	16 11.2	16 12.8	59 18.42	0.544	59 24.32	0.437	6 17.8	2.53	7.5
19	16 14.0	16 14.8	59 28.85	+0.315	59 31.81	+0.176	7 19.9	2.62	8.5
20	16 15.2	16 15.0	59 33.03	+0.025	59 32.35	−0.141	8 23.1	2.60	9.5
21	16 14.2	16 12.9	59 29.60	−0.320	59 24.63	0.509	9 24.6	2.50	10.5
22	16 10.9	16 8.3	59 17.37	−0.700	59 7.83	−0.890	10 22.5	2.32	11.5
23	16 5.1	16 1.3	58 56.03	1.075	58 42.08	1.248	11 15.9	2.14	12.5
24	15 57.0	15 52.1	58 26.16	1.402	58 8.53	1.532	12 5.3	1.98	13.5
25	15 47.0	15 41.5	57 49.50	−1.636	57 29.39	−1.711	12 51.6	1.88	14.5
26	15 35.8	15 30.1	57 8.58	1.751	56 47.50	1.757	13 36.0	1.82	15.5
27	15 24.4	15 18.8	56 26.54	1.731	56 6.08	1.674	14 19.6	1.82	16.5
28	15 13.4	15 8.4	55 46.49	−1.587	55 28.11	−1.472	15 3.5	1.85	17.5
29	15 3.8	14 59.8	55 11.27	1.331	54 56.25	1.170	15 48.5	1.90	18.5
30	14 56.2	14 53.3	54 43.26	0.992	54 32.50	0.799	16 35.2	1.98	19.5
31	14 51.0	14 49.4	54 24.13	0.594	54 18.27	−0.381	17 23.8	2.06	20.5
32	14 48.5	14 48.3	54 14.99	−0.165	54 14.30	+0.050	18 14.1	2.12	21.5

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 1.			
	h m s	s	° ′ ″	″
0	1 15 57.79	1.9168	N. 13 12 24.6	12.698
1	1 17 52.84	1.9183	13 25 4.5	12.633
2	1 19 47.98	1.9198	13 37 40.5	12.566
3	1 21 43.22	1.9216	13 50 12.4	12.498
4	1 23 38.57	1.9233	14 2 40.3	12.431
5	1 25 34.02	1.9250	14 15 4.1	12.363
6	1 27 29.57	1.9268	14 27 23.8	12.293
7	1 29 25.24	1.9288	14 39 39.3	12.223
8	1 31 21.02	1.9307	14 51 50.6	12.153
9	1 33 16.92	1.9327	15 3 57.6	12.082
10	1 35 12.94	1.9348	15 16 0.4	12.010
11	1 37 9.09	1.9368	15 27 58.8	11.937
12	1 39 5.36	1.9389	15 39 52.8	11.863
13	1 41 1.76	1.9412	15 51 42.4	11.790
14	1 42 58.30	1.9434	16 3 27.6	11.716
15	1 44 54.97	1.9457	16 15 8.3	11.640
16	1 46 51.78	1.9481	16 26 44.4	11.563
17	1 48 48.74	1.9505	16 38 15.9	11.487
18	1 50 45.84	1.9528	16 49 42.8	11.410
19	1 52 43.08	1.9553	17 1 5.1	11.333
20	1 54 40.48	1.9579	17 12 22.7	11.253
21	1 56 38.03	1.9604	17 23 35.5	11.173
22	1 58 35.73	1.9630	17 34 43.5	11.093
23	2 0 33.59	1.9658	N. 17 45 46.7	11.013
	MONDAY 2.			
0	2 2 31.62	1.9684	N. 17 56 45.0	10.931
1	2 4 29.80	1.9711	18 7 38.4	10.849
2	2 6 28.15	1.9739	18 18 26.9	10.767
3	2 8 26.67	1.9768	18 29 10.4	10.683
4	2 10 25.36	1.9796	18 39 48.8	10.598
5	2 12 24.22	1.9824	18 50 22.2	10.514
6	2 14 23.25	1.9853	19 0 50.5	10.428
7	2 16 22.46	1.9883	19 11 13.6	10.343
8	2 18 21.85	1.9913	19 21 31.6	10.256
9	2 20 21.42	1.9943	19 31 44.3	10.168
10	2 22 21.17	1.9973	19 41 51.8	10.080
11	2 24 21.10	2.0004	19 51 53.9	9.991
12	2 26 21.22	2.0036	20 1 50.7	9.902
13	2 28 21.53	2.0068	20 11 42.1	9.811
14	2 30 22.03	2.0099	20 21 28.0	9.720
15	2 32 22.72	2.0131	20 31 8.5	9.628
16	2 34 23.60	2.0163	20 40 43.4	9.536
17	2 36 24.67	2.0195	20 50 12.8	9.443
18	2 38 25.94	2.0228	20 59 36.6	9.350
19	2 40 27.41	2.0261	21 8 54.8	9.256
20	2 42 29.07	2.0293	21 18 7.3	9.161
21	2 44 30.93	2.0328	21 27 14.1	9.065
22	2 46 33.00	2.0362	21 36 15.1	8.968
23	2 48 35.27	2.0394	21 45 10.3	8.871
24	2 50 37.73	2.0428	N. 21 53 59.6	8.773

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 3.			
	h m s	s	° ′ ″	″
0	2 50 37.73	2.0428	N. 21 53 59.6	8.773
1	2 52 40.40	2.0462	22 2 43.1	8.676
2	2 54 43.27	2.0496	22 11 20.7	8.577
3	2 56 46.35	2.0530	22 19 52.3	8.477
4	2 58 49.63	2.0564	22 28 17.9	8.377
5	3 0 53.12	2.0599	22 36 37.5	8.276
6	3 2 56.82	2.0633	22 44 51.0	8.173
7	3 5 0.72	2.0668	22 52 58.3	8.071
8	3 7 4.83	2.0703	23 0 59.5	7.968
9	3 9 9.15	2.0738	23 8 54.5	7.865
10	3 11 13.68	2.0772	23 16 43.3	7.761
11	3 13 18.41	2.0806	23 24 25.8	7.656
12	3 15 23.35	2.0841	23 32 2.0	7.550
13	3 17 28.50	2.0876	23 39 31.8	7.443
14	3 19 33.86	2.0911	23 46 55.2	7.337
15	3 21 39.43	2.0945	23 54 12.2	7.229
16	3 23 45.20	2.0979	24 1 22.7	7.121
17	3 25 51.18	2.1014	24 8 26.7	7.012
18	3 27 57.37	2.1048	24 15 24.1	6.903
19	3 30 3.76	2.1083	24 22 15.0	6.793
20	3 32 10.36	2.1118	24 28 59.2	6.682
21	3 34 17.17	2.1152	24 35 36.8	6.571
22	3 36 24.18	2.1185	24 42 7.7	6.458
23	3 38 31.39	2.1218	N. 24 48 31.8	6.345
	WEDNESDAY 4.			
0	3 40 38.80	2.1253	N. 24 54 49.1	6.232
1	3 42 46.42	2.1286	25 0 59.6	6.118
2	3 44 54.23	2.1319	25 7 3.3	6.004
3	3 47 2.25	2.1353	25 13 0.1	5.888
4	3 49 10.46	2.1385	25 18 49.9	5.773
5	3 51 18.87	2.1418	25 24 32.8	5.657
6	3 53 27.47	2.1449	25 30 8.7	5.539
7	3 55 36.26	2.1482	25 35 37.5	5.422
8	3 57 45.25	2.1514	25 40 59.3	5.304
9	3 59 54.43	2.1546	25 46 14.0	5.185
10	4 2 3.80	2.1577	25 51 21.5	5.066
11	4 4 13.35	2.1608	25 56 21.9	4.946
12	4 6 23.09	2.1638	26 1 15.0	4.825
13	4 8 33.01	2.1668	26 6 0.9	4.705
14	4 10 43.11	2.1698	26 10 39.6	4.583
15	4 12 53.39	2.1728	26 15 10.9	4.461
16	4 15 3.84	2.1757	26 19 34.9	4.338
17	4 17 14.47	2.1786	26 23 51.5	4.215
18	4 19 25.27	2.1814	26 28 0.7	4.092
19	4 21 36.24	2.1842	26 32 2.5	3.968
20	4 23 47.37	2.1869	26 35 56.9	3.843
21	4 25 58.67	2.1897	26 39 43.7	3.718
22	4 28 10.13	2.1923	26 43 23.0	3.593
23	4 30 21.74	2.1948	26 46 54.8	3.467
24	4 32 33.51	2.1974	N. 26 50 19.0	3.340

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
THURSDAY 5.					SATURDAY 7.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 32 33.51	2.1974	N. 26 50 19.0	3.340	0	6 19 48.22	2.2445	N. 26 58 31.2	3.067
1	4 34 45.43	2.1999	26 53 35.6	3.213	1	6 22 2.87	2.2438	26 55 23.2	3.202
2	4 36 57.50	2.2023	26 56 44.5	3.085	2	6 24 17.47	2.2429	26 52 7.0	3.338
3	4 39 9.71	2.2047	26 59 45.8	2.958	3	6 26 32.02	2.2420	26 48 42.7	3.472
4	4 41 22.06	2.2071	27 2 39.4	2.829	4	6 28 46.51	2.2411	26 45 10.4	3.606
5	4 43 34.56	2.2094	27 5 25.3	2.701	5	6 31 0.95	2.2401	26 41 30.0	3.740
6	4 45 47.19	2.2116	27 8 3.5	2.572	6	6 33 15.32	2.2389	26 37 41.6	3.873
7	4 47 59.95	2.2138	27 10 33.9	2.442	7	6 35 29.62	2.2378	26 33 45.2	4.008
8	4 50 12.84	2.2159	27 12 56.5	2.312	8	6 37 43.85	2.2365	26 29 40.7	4.142
9	4 52 25.86	2.2180	27 15 11.3	2.182	9	6 39 58.00	2.2353	26 25 28.2	4.274
10	4 54 39.00	2.2199	27 17 18.3	2.051	10	6 42 12.08	2.2339	26 21 7.8	4.407
11	4 56 52.25	2.2218	27 19 17.4	1.919	11	6 44 26.07	2.2324	26 16 39.4	4.540
12	4 59 5.62	2.2238	27 21 8.6	1.788	12	6 46 39.97	2.2309	26 12 3.0	4.673
13	5 1 19.10	2.2255	27 22 52.0	1.657	13	6 48 53.78	2.2294	26 7 18.7	4.804
14	5 3 32.68	2.2273	27 24 27.4	1.524	14	6 51 7.50	2.2278	26 2 26.5	4.936
15	5 5 46.37	2.2290	27 25 54.9	1.392	15	6 53 21.12	2.2261	25 57 26.4	5.067
16	5 8 0.16	2.2306	27 27 14.4	1.259	16	6 55 34.63	2.2243	25 52 18.5	5.198
17	5 10 14.04	2.2322	27 28 26.0	1.127	17	6 57 48.04	2.2226	25 47 2.7	5.328
18	5 12 28.02	2.2337	27 29 29.6	0.993	18	7 0 1.34	2.2208	25 41 39.1	5.458
19	5 14 42.08	2.2350	27 30 25.2	0.859	19	7 2 14.53	2.2188	25 36 7.7	5.588
20	5 16 56.22	2.2363	27 31 12.7	0.725	20	7 4 27.60	2.2168	25 30 28.6	5.717
21	5 19 10.44	2.2377	27 31 52.2	0.592	21	7 6 40.55	2.2148	25 24 41.7	5.846
22	5 21 24.74	2.2388	27 32 23.7	0.458	22	7 8 53.38	2.2128	25 18 47.1	5.974
23	5 23 39.10	2.2399	N. 27 32 47.2	0.323	23	7 11 6.09	2.2107	N. 25 12 44.8	6.103
FRIDAY 6.					SUNDAY 8.				
0	5 25 53.53	2.2410	N. 27 33 2.5	0.188	0	7 13 18.66	2.2085	N. 25 6 34.8	6.230
1	5 28 8.02	2.2420	27 33 9.8	+0.053	1	7 15 31.11	2.2063	25 0 17.2	6.357
2	5 30 22.57	2.2429	27 33 8.9	−0.082	2	7 17 43.42	2.2041	24 53 52.0	6.483
3	5 32 37.17	2.2438	27 33 0.0	0.217	3	7 19 55.60	2.2018	24 47 19.3	6.608
4	5 34 51.82	2.2446	27 32 42.9	0.353	4	7 22 7.64	2.1994	24 40 39.0	6.734
5	5 37 6.52	2.2453	27 32 17.7	0.488	5	7 24 19.53	2.1970	24 33 51.2	6.858
6	5 39 21.25	2.2458	27 31 44.4	0.623	6	7 26 31.28	2.1947	24 26 56.0	6.983
7	5 41 36.02	2.2464	27 31 2.9	0.759	7	7 28 42.89	2.1923	24 19 53.3	7.107
8	5 43 50.82	2.2468	27 30 13.3	0.894	8	7 30 54.35	2.1897	24 12 43.2	7.230
9	5 46 5.64	2.2473	27 29 15.6	1.030	9	7 33 5.65	2.1871	24 5 25.7	7.353
10	5 48 20.49	2.2477	27 28 9.7	1.166	10	7 35 16.80	2.1846	23 58 0.9	7.474
11	5 50 35.36	2.2479	27 26 55.7	1.302	11	7 37 27.80	2.1820	23 50 28.8	7.595
12	5 52 50.24	2.2481	27 25 33.5	1.438	12	7 39 38.64	2.1793	23 42 49.5	7.715
13	5 55 5.13	2.2482	27 24 3.1	1.574	13	7 41 49.32	2.1767	23 35 3.0	7.835
14	5 57 20.02	2.2482	27 22 24.6	1.710	14	7 43 59.84	2.1739	23 27 9.3	7.955
15	5 59 34.91	2.2482	27 20 37.9	1.846	15	7 46 10.19	2.1712	23 19 8.4	8.074
16	6 1 49.80	2.2481	27 18 43.1	1.982	16	7 48 20.38	2.1684	23 11 0.4	8.192
17	6 4 4.68	2.2479	27 16 40.1	2.118	17	7 50 30.40	2.1656	23 2 45.4	8.308
18	6 6 19.55	2.2477	27 14 29.0	2.253	18	7 52 40.25	2.1628	22 54 23.4	8.425
19	6 8 34.40	2.2473	27 12 9.7	2.389	19	7 54 49.94	2.1601	22 45 54.4	8.541
20	6 10 49.22	2.2468	27 9 42.3	2.525	20	7 56 59.46	2.1572	22 37 18.5	8.656
21	6 13 4.02	2.2464	27 7 6.7	2.661	21	7 59 8.80	2.1543	22 28 35.7	8.771
22	6 15 18.79	2.2459	27 4 23.0	2.796	22	8 1 17.97	2.1514	22 19 46.0	8.885
23	6 17 33.53	2.2453	27 1 31.2	2.932	23	8 3 26.97	2.1485	22 10 49.5	8.998
24	6 19 48.22	2.2445	N. 26 58 31.2	3.067	24	8 5 35.79	2.1456	N. 22 1 46.3	9.110

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 9.					WEDNESDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	8 5 35.79	2.1456	N. 22 1 46.3	9.110	0	9 45 15.62	2.0142	N. 12 51 14.9	13.474
1	8 7 44.44	2.1427	21 52 36.3	9.222	1	9 47 16.41	2.0122	12 37 44.4	13.542
2	8 9 52.91	2.1397	21 43 19.7	9.332	2	9 49 17.08	2.0102	12 24 9.9	13.608
3	8 12 1.20	2.1367	21 33 56.5	9.442	3	9 51 17.63	2.0082	12 10 31.4	13.673
4	8 14 9.31	2.1338	21 24 26.7	9.551	4	9 53 18.06	2.0063	11 56 49.1	13.738
5	8 16 17.25	2.1308	21 14 50.4	9.659	5	9 55 18.38	2.0044	11 43 2.9	13.801
6	8 18 25.00	2.1278	21 5 7.6	9.768	6	9 57 18.59	2.0027	11 29 13.0	13.863
7	8 20 32.58	2.1248	20 55 18.3	9.874	7	9 59 18.70	2.0009	11 15 19.4	13.924
8	8 22 39.98	2.1218	20 45 22.7	9.979	8	10 1 18.70	1.9992	11 1 22.1	13.985
9	8 24 47.20	2.1188	20 35 20.8	10.085	9	10 3 18.60	1.9975	10 47 21.2	14.044
10	8 26 54.24	2.1158	20 25 12.5	10.190	10	10 5 18.40	1.9959	10 33 16.8	14.102
11	8 29 1.10	2.1128	20 14 58.0	10.293	11	10 7 18.11	1.9943	10 19 9.0	14.158
12	8 31 7.77	2.1098	20 4 37.4	10.395	12	10 9 17.72	1.9928	10 4 57.9	14.213
13	8 33 14.27	2.1068	19 54 10.6	10.497	13	10 11 17.25	1.9914	9 50 43.4	14.268
14	8 35 20.59	2.1038	19 43 37.8	10.598	14	10 13 16.69	1.9900	9 36 25.7	14.322
15	8 37 26.73	2.1008	19 32 58.9	10.698	15	10 15 16.05	1.9888	9 22 4.8	14.375
16	8 39 32.69	2.0978	19 22 14.0	10.798	16	10 17 15.34	1.9875	9 7 40.7	14.427
17	8 41 38.47	2.0949	19 11 23.2	10.895	17	10 19 14.55	1.9863	8 53 13.6	14.477
18	8 43 44.08	2.0920	19 0 26.6	10.993	18	10 21 13.69	1.9851	8 38 43.5	14.526
19	8 45 49.51	2.0890	18 49 24.1	11.090	19	10 23 12.76	1.9840	8 24 10.5	14.574
20	8 47 54.76	2.0861	18 38 15.8	11.185	20	10 25 11.77	1.9830	8 9 34.6	14.622
21	8 49 59.84	2.0832	18 27 1.9	11.279	21	10 27 10.72	1.9820	7 54 55.9	14.668
22	8 52 4.74	2.0803	18 15 42.3	11.373	22	10 29 9.61	1.9811	7 40 14.5	14.712
23	8 54 9.47	2.0774	N. 18 4 17.1	11.466	23	10 31 8.45	1.9803	N. 7 25 30.5	14.756
	TUESDAY 10.					THURSDAY 12.			
0	8 56 14.03	2.0746	N. 17 52 46.4	11.558	0	10 33 7.24	1.9795	N. 7 10 43.8	14.799
1	8 58 18.42	2.0717	17 41 10.2	11.649	1	10 35 5.99	1.9788	6 55 54.6	14.840
2	9 0 22.63	2.0688	17 29 28.5	11.739	2	10 37 4.69	1.9781	6 41 3.0	14.881
3	9 2 26.68	2.0661	17 17 41.5	11.828	3	10 39 3.36	1.9775	6 26 8.9	14.921
4	9 4 30.56	2.0633	17 5 49.2	11.916	4	10 41 1.99	1.9769	6 11 12.5	14.958
5	9 6 34.27	2.0605	16 53 51.6	12.003	5	10 43 0.59	1.9764	5 56 13.9	14.996
6	9 8 37.82	2.0578	16 41 48.8	12.089	6	10 44 59.16	1.9761	5 41 13.0	15.033
7	9 10 41.21	2.0551	16 29 40.9	12.175	7	10 46 57.72	1.9758	5 26 10.0	15.067
8	9 12 44.43	2.0524	16 17 27.8	12.260	8	10 48 56.25	1.9754	5 11 5.0	15.100
9	9 14 47.50	2.0498	16 5 9.7	12.343	9	10 50 54.77	1.9753	4 55 58.0	15.133
10	9 16 50.41	2.0472	15 52 46.7	12.425	10	10 52 53.29	1.9753	4 40 49.0	15.165
11	9 18 53.16	2.0445	15 40 18.7	12.507	11	10 54 51.80	1.9751	4 25 38.2	15.195
12	9 20 55.75	2.0419	15 27 45.9	12.587	12	10 56 50.30	1.9751	4 10 25.6	15.224
13	9 22 58.19	2.0394	15 15 8.3	12.667	13	10 58 48.81	1.9753	3 55 11.3	15.253
14	9 25 0.48	2.0370	15 2 25.9	12.745	14	11 0 47.33	1.9753	3 39 55.3	15.280
15	9 27 2.63	2.0346	14 49 38.9	12.823	15	11 2 45.85	1.9755	3 24 37.7	15.306
16	9 29 4.63	2.0321	14 36 47.2	12.899	16	11 4 44.39	1.9758	3 9 18.6	15.330
17	9 31 6.48	2.0297	14 23 51.0	12.974	17	11 6 42.95	1.9762	2 53 58.1	15.353
18	9 33 8.19	2.0273	14 10 50.3	13.049	18	11 8 41.53	1.9767	2 38 36.2	15.376
19	9 35 9.76	2.0251	13 57 45.1	13.123	19	11 10 40.15	1.9773	2 23 13.0	15.398
20	9 37 11.20	2.0228	13 44 35.6	13.195	20	11 12 38.80	1.9778	2 7 48.5	15.418
21	9 39 12.50	2.0206	13 31 21.7	13.267	21	11 14 37.48	1.9783	1 52 22.9	15.436
22	9 41 13.67	2.0184	13 18 3.6	13.337	22	11 16 36.20	1.9791	1 36 56.2	15.453
23	9 43 14.71	2.0163	13 4 41.3	13.406	23	11 18 34.97	1.9799	1 21 28.5	15.470
24	9 45 15.62	2.0142	N. 12 51 14.9	13.474	24	11 20 33.79	1.9808	N. 1 5 59.8	15.485

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 13.					**SUNDAY 15.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 20 33.79	1.9808	N. 1 5 59.8	15.485	0	12 58 6.63	2.1138	S. 11 11 16.8	14.731
1	11 22 32.67	1.9818	0 50 30.3	15.499	1	13 0 13.60	2.1185	11 25 59.2	14.682
2	11 24 31.60	1.9828	0 34 59.9	15.513	2	13 2 20.85	2.1232	11 40 38.6	14.631
3	11 26 30.60	1.9838	0 19 28.8	15.524	3	13 4 28.38	2.1280	11 55 14.9	14.579
4	11 28 29.66	1.9850	N. 0 3 57.0	15.535	4	13 6 36.21	2.1329	12 9 48.1	14.526
5	11 30 28.80	1.9863	S. 0 11 35.4	15.544	5	13 8 44.33	2.1379	12 24 18.0	14.471
6	11 32 28.01	1.9876	0 27 8.3	15.552	6	13 10 52.76	2.1430	12 38 44.6	14.414
7	11 34 27.31	1.9890	0 42 41.6	15.558	7	13 13 1.49	2.1481	12 53 7.7	14.356
8	11 36 26.69	1.9904	0 58 15.3	15.565	8	13 15 10.53	2.1533	13 7 27.3	14.297
9	11 38 26.16	1.9920	1 13 49.4	15.570	9	13 17 19.88	2.1584	13 21 43.3	14.236
10	11 40 25.73	1.9937	1 29 23.7	15.573	10	13 19 29.54	2.1638	13 35 55.6	14.173
11	11 42 25.40	1.9953	1 44 58.1	15.574	11	13 21 39.53	2.1692	13 50 4.1	14.109
12	11 44 25.17	1.9971	2 0 32.6	15.575	12	13 23 49.84	2.1746	14 4 8.7	14.043
13	11 46 25.05	1.9990	2 16 7.1	15.574	13	13 26 0.48	2.1801	14 18 9.3	13.976
14	11 48 25.05	2.0009	2 31 41.5	15.573	14	13 28 11.45	2.1857	14 32 5.8	13.908
15	11 50 25.16	2.0029	2 47 15.8	15.570	15	13 30 22.76	2.1913	14 45 58.2	13.838
16	11 52 25.40	2.0051	3 2 49.9	15.566	16	13 32 34.40	2.1969	14 59 46.3	13.765
17	11 54 25.77	2.0073	3 18 23.7	15.560	17	13 34 46.39	2.2028	15 13 30.0	13.692
18	11 56 26.27	2.0095	3 33 57.1	15.553	18	13 36 58.73	2.2086	15 27 9.3	13.617
19	11 58 26.91	2.0118	3 49 30.0	15.544	19	13 39 11.42	2.2144	15 40 44.0	13.540
20	12 0 27.69	2.0143	4 5 2.4	15.536	20	13 41 24.46	2.2203	15 54 14.1	13.463
21	12 2 28.62	2.0168	4 20 34.3	15.526	21	13 43 37.86	2.2264	16 7 39.5	13.383
22	12 4 29.70	2.0193	4 36 5.5	15.513	22	13 45 51.63	2.2325	16 21 0.0	13.301
23	12 6 30.93	2.0219	S. 4 51 35.9	15.500	23	13 48 5.76	2.2385	S. 16 34 15.6	13.218
	SATURDAY 14.					**MONDAY 16.**			
0	12 8 32.33	2.0248	S. 5 7 5.5	15.485	0	13 50 20.25	2.2446	S. 16 47 26.2	13.133
1	12 10 33.90	2.0275	5 22 34.1	15.469	1	13 52 35.11	2.2508	17 0 31.6	13.047
2	12 12 35.63	2.0303	5 38 1.8	15.453	2	13 54 50.35	2.2571	17 13 31.8	12.959
3	12 14 37.54	2.0333	5 53 28.4	15.434	3	13 57 5.96	2.2633	17 26 26.7	12.870
4	12 16 39.63	2.0363	6 8 53.9	15.414	4	13 59 21.95	2.2697	17 39 16.2	12.779
5	12 18 41.90	2.0395	6 24 18.1	15.393	5	14 1 38.32	2.2761	17 52 0.2	12.687
6	12 20 44.37	2.0428	6 39 41.0	15.370	6	14 3 55.08	2.2826	18 4 38.6	12.592
7	12 22 47.03	2.0460	6 55 2.5	15.347	7	14 6 12.23	2.2890	18 17 11.2	12.496
8	12 24 49.89	2.0494	7 10 22.6	15.322	8	14 8 29.76	2.2954	18 29 38.1	12.398
9	12 26 52.96	2.0528	7 25 41.1	15.295	9	14 10 47.68	2.3020	18 41 59.0	12.298
10	12 28 56.23	2.0563	7 40 58.0	15.268	10	14 13 6.00	2.3086	18 54 13.9	12.198
11	12 30 59.72	2.0600	7 56 13.2	15.238	11	14 15 24.71	2.3151	19 6 22.7	12.095
12	12 33 3.43	2.0637	8 11 26.6	15.208	12	14 17 43.81	2.3218	19 18 25.3	11.991
13	12 35 7.36	2.0673	8 26 38.1	15.175	13	14 20 3.32	2.3285	19 30 21.6	11.885
14	12 37 11.51	2.0712	8 41 47.6	15.142	14	14 22 23.23	2.3352	19 42 11.5	11.778
15	12 39 15.90	2.0752	8 56 55.1	15.108	15	14 24 43.54	2.3418	19 53 54.9	11.668
16	12 41 20.53	2.0792	9 12 0.5	15.072	16	14 27 4.25	2.3485	20 5 31.7	11.558
17	12 43 25.40	2.0833	9 27 3.7	15.034	17	14 29 25.36	2.3553	20 17 1.8	11.445
18	12 45 30.52	2.0873	9 42 4.6	14.995	18	14 31 46.88	2.3621	20 28 25.1	11.331
19	12 47 35.88	2.0915	9 57 3.1	14.954	19	14 34 8.81	2.3689	20 39 41.5	11.215
20	12 49 41.50	2.0958	10 11 59.1	14.912	20	14 36 31.15	2.3757	20 50 50.9	11.098
21	12 51 47.38	2.1003	10 26 52.5	14.869	21	14 38 53.89	2.3824	21 1 53.2	10.978
22	12 53 53.53	2.1047	10 41 43.4	14.825	22	14 41 17.04	2.3893	21 12 48.3	10.857
23	12 55 59.94	2.1092	10 56 31.5	14.778	23	14 43 40.60	2.3960	21 23 36.0	10.734
24	12 58 6.63	2.1138	S. 11 11 16.8	14.731	24	14 46 4.56	2.4028	S. 21 34 16.4	10.611

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 17.					**THURSDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	14 46 4.56	2.4028	S. 21 34 16.4	10.611	0	16 48 28.84	2.6660	S. 27 11 1.7	2.903
1	14 48 28.93	2.4096	21 44 49.3	10.484	1	16 51 8.89	2.6688	27 13 50.2	2.714
2	14 50 53.71	2.4164	21 55 14.5	10.356	2	16 53 49.10	2.6715	27 16 27.4	2.525
3	14 53 18.90	2.4232	22 5 32.0	10.228	3	16 56 29.47	2.6740	27 18 53.2	2.335
4	14 55 44.49	2.4299	22 15 41.8	10.097	4	16 59 9.98	2.6763	27 21 7.6	2.145
5	14 58 10.49	2.4367	22 25 43.6	9.963	5	17 1 50.63	2.6786	27 23 10.6	1.953
6	15 0 36.89	2.4434	22 35 37.4	9.829	6	17 4 31.41	2.6806	27 25 2.0	1.762
7	15 3 3.70	2.4502	22 45 23.1	9.694	7	17 7 12.30	2.6824	27 26 42.0	1.570
8	15 5 30.91	2.4568	22 55 0.7	9.558	8	17 9 53.30	2.6841	27 28 10.4	1.378
9	15 7 58.52	2.4635	23 4 30.0	9.418	9	17 12 34.39	2.6856	27 29 27.3	1.185
10	15 10 26.53	2.4702	23 13 50.9	9.278	10	17 15 15.57	2.6869	27 30 32.6	0.992
11	15 12 54.94	2.4768	23 23 3.3	9.135	11	17 17 56.82	2.6881	27 31 26.3	0.798
12	15 15 23.74	2.4833	23 32 7.1	8.991	12	17 20 38.14	2.6891	27 32 8.3	0.603
13	15 17 52.93	2.4898.	23 41 2.2	8.846	13	17 23 19.51	2.6899	27 32 38.7	0.410
14	15 20 22.52	2.4963	23 49 48.6	8.699	14	17 26 0.93	2.6906	27 32 57.5	0.216
15	15 22 52.49	2.5028	23 58 26.1	8.551	15	17 28 42.38	2.6911	27 33 4.6	—0.021
16	15 25 22.85	2.5092	24 6 54.7	8.401	16	17 31 23.86	2.6914	27 33 0.0	+0.173
17	15 27 53.59	2.5155	24 15 14.2	8.249	17	17 34 5.35	2.6914	27 32 43.8	0.368
18	15 30 24.71	2.5218	24 23 24.6	8.097	18	17 36 46.83	2.6913	27 32 15.9	0.562
19	15 32 56.20	2.5279	24 31 25.8	7.942	19	17 39 28.31	2.6912	27 31 36.4	0.756
20	15 35 28.06	2.5341	24 39 17.6	7.786	20	17 42 9.77	2.6908	27 30 45.2	0.950
21	15 38 0.29	2.5402	24 47 0.1	7.628	21	17 44 51.20	2.6902	27 29 42.4	1.144
22	15 40 32.88	2.5462	24 54 33.0	7.469	22	17 47 32.59	2.6894	27 28 27.9	1.338
23	15 43 5.83	2.5521	S. 25 1 56.4	7.309	23	17 50 13.93	2.6885	S. 27 27 1.8	1.533
	WEDNESDAY 18.					**FRIDAY 20.**			
0	15 45 39.13	2.5579	S. 25 9 10.1	7.148	0	17 52 55.21	2.6874	S. 27 25 24.0	1.727
1	15 48 12.78	2.5638	25 16 14.1	6.984	1	17 55 36.42	2.6862	27 23 34.6	1.919
2	15 50 46.78	2.5694	25 23 8.2	6.819	2	17 58 17.55	2.6847	27 21 33.7	2.112
3	15 53 21.11	2.5750	25 29 52.4	6.653	3	18 0 58.58	2.6830	27 19 21.2	2.304
4	15 55 55.78	2.5806	25 36 26.6	6.486	4	18 3 39.51	2.6813	27 16 57.2	2.496
5	15 58 30.78	2.5859	25 42 50.7	6.319	5	18 6 20.33	2.6793	27 14 21.7	2.688
6	16 1 6.09	2.5912	25 49 4.7	6.148	6	18 9 1.03	2.6772	27 11 34.7	2.878
7	16 3 41.72	2.5964	25 55 8.5	5.977	7	18 11 41.59	2.6748	27 8 36.3	3.069
8	16 6 17.66	2.6015	26 1 1.9	5.804	8	18 14 22.01	2.6724	27 5 26.4	3.259
9	16 8 53.90	2.6065	26 6 45.0	5.631	9	18 17 2.28	2.6698	27 2 5.2	3.448
10	16 11 30.44	2.6113	26 12 17.6	5.456	10	18 19 42.39	2.6671	26 58 32.6	3.637
11	16 14 7.26	2.6161	26 17 39.7	5.281	11	18 22 22.33	2.6642	26 54 48.8	3.824
12	16 16 44.37	2.6208	26 22 51.3	5.104	12	18 25 2.09	2.6611	26 50 53.7	4.012
13	16 19 21.76	2.6253	26 27 52.2	4.926	13	18 27 41.66	2.6578	26 46 47.4	4.198
14	16 21 59.41	2.6297	26 32 42.4	4.747	14	18 30 21.03	2.6544	26 42 30.0	4.383
15	16 24 37.32	2.6339	26 37 21.8	4.566	15	18 33 0.19	2.6508	26 38 1.5	4.568
16	16 27 15.48	2.6380	26 41 50.3	4.384	16	18 35 39.13	2.6471	26 33 21.9	4.751
17	16 29 53.88	2.6420	26 46 7.9	4.203	17	18 38 17.84	2.6433	26 28 31.4	4.933
18	16 32 32.52	2.6459	26 50 14.6	4.020	18	18 40 56.32	2.6393	26 23 29.9	5.116
19	16 35 11.39	2.6497	26 54 10.3	3.836	19	18 43 34.56	2.6353	26 18 17.5	5.297
20	16 37 50.48	2.6533	26 57 54.9	3.651	20	18 46 12.55	2.6310	26 12 54.3	5.476
21	16 40 29.78	2.6567	27 1 28.4	3.465	21	18 48 50.28	2.6266	26 7 20.4	5.654
22	16 43 9.28	2.6599	27 4 50.7	3.278	22	18 51 27.74	2.6221	26 1 35.8	5.832
23	16 45 48.97	2.6630	27 8 1.8	3.092	23	18 54 4.93	2.6174	25 55 40.6	6.008
24	16 48 28.84	2.6660	S. 27 11 1.7	2.903	24	18 56 41.83	2.6126	S. 25 49 34.8	6.184

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
SATURDAY 21.				
	h m s	s	° ′ ″	″
0	18 56 41.83	2.6126	S. 25 49 34.8	6.184
1	18 59 18.44	2.6078	25 43 18.5	6.358
2	19 1 54.76	2.6028	25 36 51.9	6.529
3	19 4 30.77	2.5976	25 30 15.0	6.701
4	19 7 6.47	2.5923	25 23 27.8	6.871
5	19 9 41.85	2.5870	25 16 30.5	7.039
6	19 12 16.91	2.5816	25 9 23.1	7.207
7	19 14 51.64	2.5761	25 2 5.7	7.373
8	19 17 26.04	2.5704	24 54 38.4	7.537
9	19 20 0.09	2.5647	24 47 1.3	7.700
10	19 22 33.80	2.5589	24 39 14.4	7.863
11	19 25 7.16	2.5530	24 31 17.8	8.023
12	19 27 40.16	2.5469	24 23 11.7	8.181
13	19 30 12.79	2.5408	24 14 56.1	8.338
14	19 32 45.06	2.5347	24 6 31.2	8.493
15	19 35 16.95	2.5284	23 57 56.9	8.648
16	19 37 48.47	2.5222	23 49 13.5	8.799
17	19 40 19.61	2.5158	23 40 21.0	8.950
18	19 42 50.37	2.5094	23 31 19.5	9.099
19	19 45 20.74	2.5028	23 22 9.1	9.247
20	19 47 50.71	2.4963	23 12 49.9	9.393
21	19 50 20.29	2.4897	23 3 22.0	9.537
22	19 52 49.47	2.4831	22 53 45.5	9.679
23	19 55 18.26	2.4764	S. 22 44 0.5	9.820
SUNDAY 22.				
0	19 57 46.64	2.4696	S. 22 34 7.1	9.959
1	20 0 14.61	2.4628	22 24 5.4	10.096
2	20 2 42.18	2.4561	22 13 55.6	10.231
3	20 5 9.34	2.4492	22 3 37.7	10.365
4	20 7 36.08	2.4423	21 53 11.8	10.498
5	20 10 2.41	2.4354	21 42 38.0	10.628
6	20 12 28.33	2.4285	21 31 56.5	10.756
7	20 14 53.83	2.4215	21 21 7.3	10.883
8	20 17 18.91	2.4146	21 10 10.6	11.008
9	20 19 43.58	2.4076	20 59 6.4	11.131
10	20 22 7.82	2.4006	20 47 54.9	11.252
11	20 24 31.65	2.3936	20 36 36.2	11.371
12	20 26 55.05	2.3866	20 25 10.4	11.488
13	20 29 18.04	2.3796	20 13 37.6	11.604
14	20 31 40.60	2.3726	20 1 57.9	11.718
15	20 34 2.75	2.3656	19 50 11.4	11.830
16	20 36 24.47	2.3586	19 38 18.3	11.940
17	20 38 45.78	2.3517	19 26 18.6	12.048
18	20 41 6.67	2.3447	19 14 12.5	12.155
19	20 43 27.14	2.3377	19 2 0.0	12.260
20	20 45 47.19	2.3307	18 49 41.3	12.363
21	20 48 6.82	2.3238	18 37 16.4	12.464
22	20 50 26.04	2.3169	18 24 45.6	12.563
23	20 52 44.85	2.3100	18 12 8.8	12.662
24	20 55 3.24	2.3031	S. 17 59 26.2	12.757

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
MONDAY 23.				
	h m s	s	° ′ ″	″
0	20 55 3.24	2.3031	S. 17 59 26.2	12.757
1	20 57 21.22	2.2963	17 46 38.0	12.850
2	20 59 38.79	2.2895	17 33 44.2	12.942
3	21 1 55.96	2.2828	17 20 45.0	13.032
4	21 4 12.72	2.2759	17 7 40.4	13.121
5	21 6 29.07	2.2693	16 54 30.5	13.208
6	21 8 45.03	2.2626	16 41 15.5	13.292
7	21 11 0.58	2.2559	16 27 55.5	13.374
8	21 13 15.74	2.2493	16 14 30.6	13.456
9	21 15 30.50	2.2428	16 1 0.8	13.536
10	21 17 44.87	2.2363	15 47 26.3	13.613
11	21 19 58.85	2.2298	15 33 47.2	13.688
12	21 22 12.45	2.2234	15 20 3.7	13.762
13	21 24 25.66	2.2170	15 6 15.8	13.834
14	21 26 38.49	2.2108	14 52 23.6	13.905
15	21 28 50.95	2.2045	14 38 27.2	13.973
16	21 31 3.03	2.1983	14 24 26.8	14.040
17	21 33 14.74	2.1921	14 10 22.4	14.106
18	21 35 26.08	2.1860	13 56 14.1	14.170
19	21 37 37.06	2.1800	13 42 2.0	14.232
20	21 39 47.68	2.1740	13 27 46.3	14.291
21	21 41 57.94	2.1681	13 13 27.1	14.349
22	21 44 7.85	2.1623	12 59 4.4	14.407
23	21 46 17.41	2.1564	S. 12 44 38.3	14.462
TUESDAY 24.				
0	21 48 26.62	2.1506	S. 12 30 9.0	14.515
1	21 50 35.48	2.1449	12 15 36.5	14.567
2	21 52 44.01	2.1393	12 1 1.0	14.616
3	21 54 52.20	2.1338	11 46 22.6	14.664
4	21 57 0.06	2.1283	11 31 41.3	14.711
5	21 59 7.60	2.1229	11 16 57.3	14.756
6	22 1 14.81	2.1175	11 2 10.6	14.800
7	22 3 21.70	2.1122	10 47 21.3	14.842
8	22 5 28.27	2.1069	10 32 29.6	14.882
9	22 7 34.53	2.1018	10 17 35.5	14.921
10	22 9 40.49	2.0968	10 2 39.1	14.958
11	22 11 46.14	2.0918	9 47 40.6	14.993
12	22 13 51.50	2.0868	9 32 39.9	15.028
13	22 15 56.56	2.0819	9 17 37.2	15.060
14	22 18 1.33	2.0772	9 2 32.7	15.090
15	22 20 5.82	2.0724	8 47 26.4	15.120
16	22 22 10.02	2.0678	8 32 18.3	15.148
17	22 24 13.95	2.0632	8 17 8.6	15.175
18	22 26 17.60	2.0587	8 1 57.3	15.200
19	22 28 20.99	2.0543	7 46 44.6	15.223
20	22 30 24.12	2.0499	7 31 30.6	15.245
21	22 32 26.98	2.0456	7 16 15.2	15.266
22	22 34 29.59	2.0414	7 0 58.7	15.284
23	22 36 31.95	2.0373	6 45 41.1	15.303
24	22 38 34.06	2.0332	S. 6 30 22.4	15.319

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 25.					FRIDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 38 34.06	2.0332	S. 6 30 22.4	15.319	0	0 12 55.31	1.9268	N. 5 39 25.9	14.646
1	22 40 35.93	2.0293	6 15 2.8	15.333	1	0 14 50.90	1.9263	5 54 3.5	14.606
2	22 42 37.57	2.0253	5 59 42.4	15.347	2	0 16 46.47	1.9259	6 8 38.6	14.564
3	22 44 38.97	2.0215	5 44 21.2	15.359	3	0 18 42.01	1.9256	6 23 11.2	14.523
4	22 46 40.15	2.0178	5 28 59.3	15.370	4	0 20 37.54	1.9253	6 37 41.3	14.479
5	22 48 41.10	2.0140	5 13 36.8	15.379	5	0 22 33.05	1.9252	6 52 8.7	14.435
6	22 50 41.83	2.0104	4 58 13.8	15.388	6	0 24 28.56	1.9251	7 6 33.5	14.390
7	22 52 42.35	2.0069	4 42 50.3	15.394	7	0 26 24.06	1.9250	7 20 55.5	14.344
8	22 54 42.66	2.0034	4 27 26.5	15.399	8	0 28 19.56	1.9250	7 35 14.7	14.297
9	22 56 42.76	2.0001	4 12 2.4	15.404	9	0 30 15.06	1.9251	7 49 31.1	14.249
10	22 58 42.67	1.9968	3 56 38.0	15.408	10	0 32 10.57	1.9253	8 3 44.6	14.201
11	23 0 42.38	1.9936	3 41 13.5	15.408	11	0 34 6.09	1.9255	8 17 55.2	14.152
12	23 2 41.90	1.9904	3 25 49.0	15.408	12	0 36 1.63	1.9258	8 32 2.8	14.101
13	23 4 41.23	1.9873	3 10 24.5	15.408	13	0 37 57.19	1.9262	8 46 7.3	14.048
14	23 6 40.38	1.9843	2 55 0.1	15.405	14	0 39 52.77	1.9265	9 0 8.7	13.996
15	23 8 39.35	1.9814	2 39 35.9	15.402	15	0 41 48.37	1.9269	9 14 7.0	13.944
16	23 10 38.15	1.9786	2 24 11.9	15.397	16	0 43 44.00	1.9275	9 28 2.0	13.890
17	23 12 36.78	1.9758	2 8 48.3	15.390	17	0 45 39.67	1.9282	9 41 53.8	13.836
18	23 14 35.25	1.9732	1 53 25.1	15.383	18	0 47 35.38	1.9288	9 55 42.3	13.781
19	23 16 33.56	1.9706	1 38 2.3	15.375	19	0 49 31.12	1.9294	10 9 27.5	13.724
20	23 18 31.72	1.9680	1 22 40.1	15.365	20	0 51 26.91	1.9303	10 23 9.2	13.667
21	23 20 29.72	1.9655	1 7 18.5	15.354	21	0 53 22.75	1.9311	10 36 47.5	13.608
22	23 22 27.58	1.9631	0 51 57.6	15.343	22	0 55 18.64	1.9319	10 50 22.2	13.549
23	23 24 25.29	1.9608	S. 0 36 37.4	15.329	23	0 57 14.58	1.9328	N. 11 3 53.4	13.489
	THURSDAY 26.					SATURDAY 28.			
0	23 26 22.87	1.9586	S. 0 21 18.1	15.314	0	0 59 10.58	1.9338	N. 11 17 21.0	13.429
1	23 28 20.32	1.9564	S. 0 5 59.7	15.299	1	1 1 6.64	1.9349	11 30 44.9	13.368
2	23 30 17.64	1.9543	N. 0 9 17.8	15.283	2	1 3 2.77	1.9361	11 44 5.1	13.306
3	23 32 14.84	1.9523	0 24 34.3	15.265	3	1 4 58.97	1.9373	11 57 21.6	13.243
4	23 34 11.92	1.9503	0 39 49.6	15.246	4	1 6 55.24	1.9384	12 10 34.3	13.180
5	23 36 8.88	1.9484	0 55 3.8	15.226	5	1 8 51.58	1.9397	12 23 43.2	13.115
6	23 38 5.73	1.9467	1 10 16.7	15.204	6	1 10 48.00	1.9410	12 36 48.1	13.049
7	23 40 2.48	1.9450	1 25 28.3	15.183	7	1 12 44.50	1.9424	12 49 49.1	12.983
8	23 41 59.13	1.9433	1 40 38.6	15.160	8	1 14 41.09	1.9438	13 2 46.1	12.917
9	23 43 55.68	1.9418	1 55 47.5	15.135	9	1 16 37.76	1.9453	13 15 39.1	12.849
10	23 45 52.14	1.9403	2 10 54.8	15.109	10	1 18 34.53	1.9469	13 28 28.0	12.781
11	23 47 48.51	1.9388	2 26 0.6	15.083	11	1 20 31.39	1.9485	13 41 12.8	12.712
12	23 49 44.80	1.9375	2 41 4.7	15.055	12	1 22 28.35	1.9502	13 53 53.4	12.642
13	23 51 41.01	1.9363	2 56 7.2	15.027	13	1 24 25.41	1.9518	14 6 29.8	12.571
14	23 53 37.15	1.9350	3 11 7.9	14.997	14	1 26 22.57	1.9536	14 19 1.9	12.499
15	23 55 33.21	1.9338	3 26 6.8	14.967	15	1 28 19.84	1.9553	14 31 29.7	12.428
16	23 57 29.21	1.9328	3 41 3.9	14.935	16	1 30 17.21	1.9572	14 43 53.2	12.354
17	23 59 25.14	1.9318	3 55 59.0	14.903	17	1 32 14.70	1.9592	14 56 12.2	12.280
18	0 1 21.02	1.9309	4 10 52.2	14.869	18	1 34 12.31	1.9611	15 8 26.8	12.206
19	0 3 16.85	1.9300	4 25 43.3	14.834	19	1 36 10.03	1.9630	15 20 36.9	12.131
20	0 5 12.62	1.9292	4 40 32.3	14.798	20	1 38 7.87	1.9650	15 32 42.5	12.055
21	0 7 8.35	1.9285	4 55 19.1	14.762	21	1 40 5.83	1.9671	15 44 43.5	11.978
22	0 9 4.04	1.9278	5 10 3.7	14.724	22	1 42 3.92	1.9692	15 56 39.9	11.901
23	0 10 59.69	1.9273	5 24 46.0	14.685	23	1 44 2.13	1.9713	16 8 31.6	11.823
24	0 12 55.31	1.9268	N. 5 39 25.9	14.646	24	1 46 0.48	1.9736	N. 16 20 18.6	11.744

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

SUNDAY 29.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	1 46 0.48	1.9736	N. 16 20 18.6	11.744
1	1 47 58.96	1.9758	16 32 0.9	11.664
2	1 49 57.57	1.9781	16 43 38.3	11.583
3	1 51 56.33	1.9804	16 55 10.9	11.503
4	1 53 55.22	1.9827	17 6 38.6	11.421
5	1 55 54.25	1.9851	17 18 1.4	11.338
6	1 57 53.43	1.9876	17 29 19.2	11.255
7	1 59 52.76	1.9900	17 40 32.0	11.172
8	2 1 52.23	1.9924	17 51 39.8	11.087
9	2 3 51.85	1.9950	18 2 42.4	11.001
10	2 5 51.63	1.9976	18 13 39.9	10.916
11	2 7 51.56	2.0002	18 24 32.3	10.829
12	2 9 51.65	2.0028	18 35 19.4	10.741
13	2 11 51.90	2.0055	18 46 1.2	10.653
14	2 13 52.31	2.0082	18 56 37.7	10.564
15	2 15 52.88	2.0108	19 7 8.9	10.475
16	2 17 53.61	2.0136	19 17 34.7	10.384
17	2 19 54.51	2.0163	19 27 55.0	10.293
18	2 21 55.57	2.0192	19 38 9.9	10.203
19	2 23 56.81	2.0221	19 48 19.3	10.110
20	2 25 58.22	2.0249	19 58 23.1	10.017
21	2 27 59.80	2.0278	20 8 21.3	9.923
22	2 30 1.55	2.0306	20 18 13.8	9.828
23	2 32 3.47	2.0335	N. 20 28 0.7	9.733

MONDAY 30.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	2 34 5.57	2.0365	N. 20 37 41.8	9.638
1	2 36 7.85	2.0394	20 47 17.2	9.542
2	2 38 10.30	2.0423	20 56 46.8	9.445
3	2 40 12.93	2.0453	21 6 10.6	9.348
4	2 42 15.74	2.0483	21 15 28.5	9.249
5	2 44 18.73	2.0514	21 24 40.5	9.150
6	2 46 21.91	2.0545	21 33 46.5	9.050
7	2 48 25.27	2.0575	21 42 46.5	8.950
8	2 50 28.81	2.0605	21 51 40.5	8.849
9	2 52 32.53	2.0636	22 0 28.4	8.748
10	2 54 36.44	2.0667	22 9 10.2	8.645
11	2 56 40.53	2.0697	22 17 45.8	8.543
12	2 58 44.80	2.0728	22 26 15.3	8.439
13	3 0 49.26	2.0759	22 34 38.5	8.335
14	3 2 53.91	2.0790	22 42 55.5	8.230
15	3 4 58.74	2.0821	22 51 6.1	8.124
16	3 7 3.76	2.0853	22 59 10.4	8.018
17	3 9 8.97	2.0883	23 7 8.3	7.912
18	3 11 14.36	2.0914	23 14 59.8	7.805
19	3 13 19.94	2.0945	23 22 44.9	7.698
20	3 15 25.70	2.0976	23 30 23.5	7.589
21	3 17 31.65	2.1007	23 37 55.6	7.480
22	3 19 37.78	2.1038	23 45 21.1	7.370
23	3 21 44.10	2.1068	23 52 40.0	7.259
24	3 23 50.60	2.1099	N. 23 59 52.2	7.148

TUESDAY 31.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	3 23 50.60	2.1099	N. 23 59 52.2	7.148
1	3 25 57.29	2.1130	24 6 57.8	7.038
2	3 28 4.16	2.1160	24 13 56.7	6.925
3	3 30 11.21	2.1190	24 20 48.8	6.813
4	3 32 18.44	2.1221	24 27 34.2	6.700
5	3 34 25.86	2.1251	24 34 12.8	6.586
6	3 36 33.45	2.1280	24 40 44.5	6.472
7	3 38 41.22	2.1310	24 47 9.4	6.358
8	3 40 49.17	2.1340	24 53 27.4	6.242
9	3 42 57.30	2.1369	24 59 38.4	6.125
10	3 45 5.60	2.1398	25 5 42.4	6.008
11	3 47 14.08	2.1428	25 11 39.4	5.892
12	3 49 22.73	2.1456	25 17 29.4	5.774
13	3 51 31.55	2.1484	25 23 12.3	5.656
14	3 53 40.54	2.1513	25 28 48.1	5.537
15	3 55 49.70	2.1541	25 34 16.7	5.418
16	3 57 59.03	2.1568	25 39 38.2	5.298
17	4 0 8.52	2.1595	25 44 52.5	5.178
18	4 2 18.17	2.1623	25 49 59.6	5.058
19	4 4 27.99	2.1649	25 54 59.4	4.936
20	4 6 37.96	2.1675	25 59 51.9	4.814
21	4 8 48.09	2.1702	26 4 37.1	4.692
22	4 10 58.38	2.1728	26 9 14.9	4.569
23	4 13 8.82	2.1753	N. 26 13 45.4	4.447

WEDNESDAY, SEPTEMBER 1.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	4 15 19.41	2.1778	N. 26 18 8.5	4.323

PHASES OF THE MOON.

			d	h	m
☾	Last Quarter	Aug.	2	9	27.3
●	New Moon		10	10	52.4
☽	First Quarter		17	14	17.4
○	Full Moon		24	9	40.5

			d	h
☾	Apogee	Aug.	4	14.6
☾	Perigee		20	2.2

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Added to / Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Wed.	1	10 38 29.48	9.079	N. 8 35 24.3	−54.15	15 52.85	64.40	0 13.07	0.775
Thur.	2	10 42 7.24	9.067	8 13 40.5	54.49	15 53.07	64.36	0 5.67	0.787
Fri.	3	10 45 44.73	9.056	7 51 48.6	54.82	15 53.29	64.32	0 24.68	0.798
Sat.	4	10 49 21.95	9.046	7 29 49.1	−55.14	15 53.52	64.28	0 43.96	0.809
SUN.	5	10 52 58.92	9.036	7 7 42.1	55.44	15 53.75	64.24	1 3.49	0.819
Mon.	6	10 56 35.67	9.027	6 45 28.0	55.73	15 53.99	64.21	1 23.25	0.828
Tues.	7	11 0 12.19	9.018	6 23 7.3	−56.00	15 54.23	64.18	1 43.22	0.836
Wed.	8	11 3 48.52	9.010	6 0 40.2	56.26	15 54.47	64.15	2 3.39	0.844
Thur.	9	11 7 24.67	9.003	5 38 7.0	56.50	15 54.71	64.12	2 23.74	0.852
Fri.	10	11 11 0.64	8.996	5 15 28.2	−56.73	15 54.96	64.09	2 44.26	0.859
Sat.	11	11 14 36.47	8.990	4 52 44.1	56.94	15 55.21	64.07	3 4.94	0.865
SUN.	12	11 18 12.15	8.984	4 29 55.1	57.14	15 55.47	64.05	3 25.75	0.870
Mon.	13	11 21 47.71	8.979	4 7 1.5	−57.32	15 55.73	64.04	3 46.69	0.875
Tues.	14	11 25 23.16	8.975	3 44 3.6	57.49	15 55.99	64.03	4 7.74	0.879
Wed.	15	11 28 58.52	8.972	3 21 1.9	57.64	15 56.25	64.02	4 28.87	0.882
Thur.	16	11 32 33.81	8.970	2 57 56.6	−57.78	15 56.51	64.01	4 50.08	0.885
Fri.	17	11 36 9.05	8.968	2 34 48.1	57.91	15 56.78	64.01	5 11.33	0.886
Sat.	18	11 39 44.25	8.967	2 11 36.7	58.03	15 57.05	64.01	5 32.62	0.887
SUN.	19	11 43 19.45	8.967	1 48 22.8	−58.13	15 57.31	64.01	5 53.92	0.887
Mon.	20	11 46 54.66	8.968	1 25 6.6	58.22	15 57.58	64.02	6 15.21	0.886
Tues.	21	11 50 29.90	8.970	1 1 48.4	58.29	15 57.85	64.03	6 36.46	0.884
Wed.	22	11 54 5.21	8.973	0 38 28.6	−58.35	15 58.12	64.04	6 57.64	0.881
Thur.	23	11 57 40.60	8.977	N. 0 15 7.4	58.40	15 58.40	64.06	7 18.75	0.877
Fri.	24	12 1 16.10	8.982	S. 0 8 14.8	58.44	15 58.67	64.08	7 39.75	0.872
Sat.	25	12 4 51.73	8.988	0 31 37.7	−58.46	15 58.94	64.10	8 0.61	0.866
SUN.	26	12 8 27.52	8.995	0 55 1.0	58.47	15 59.21	64.12	8 21.32	0.859
Mon.	27	12 12 3.48	9.003	1 18 24.4	58.47	15 59.47	64.14	8 41.86	0.851
Tues.	28	12 15 39.65	9.012	1 41 47.5	−58.45	15 59.74	64.17	9 2.19	0.843
Wed.	29	12 19 16.04	9.022	2 5 10.0	58.42	16 0.01	64.20	9 22.30	0.833
Thur.	30	12 22 52.68	9.033	2 28 31.7	58.37	16 0.28	64.23	9 42.16	0.822
Fri.	31	12 26 29.58	9.044	S. 2 51 52.0	−58.31	16 0.55	64.27	10 1.75	0.810

NOTE.—The mean time of semidiameter passing the meridian may be found by subtracting $0^s.18$ from the sidereal time.

The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Subtracted from / Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	10 38 29.45	9.081	N. 8 35 24.5	−54.16	0 13.08	0.775	10 38 16.37
Thur.	2	10 42 7.26	9.070	8 13 40.4	54.50	0 5.67	0.787	10 42 12.93
Fri.	3	10 45 44.79	9.059	7 51 48.3	54.82	0 24.69	0.798	10 46 9.48
Sat.	4	10 49 22.06	9.048	7 29 48.4	−55.14	0 43.97	0.809	10 50 6.03
SUN.	5	10 52 59.08	9.038	7 7 41.1	55.45	1 3.50	0.819	10 54 2.59
Mon.	6	10 56 35.88	9.029	6 45 26.8	55.74	1 23.27	0.828	10 57 59.14
Tues.	7	11 0 12.45	9.020	6 23 5.7	−56.01	1 43.24	0.836	11 1 55.70
Wed.	8	11 3 48.83	9.012	6 0 38.2	56.27	2 3.42	0.844	11 5 52.25
Thur.	9	11 7 25.03	9.005	5 38 4.8	56.51	2 23.77	0.852	11 9 48.80
Fri.	10	11 11 1.06	8.998	5 15 25.6	−56.74	2 44.30	0.859	11 13 45.36
Sat.	11	11 14 36.93	8.991	4 52 41.2	56.95	3 4.98	0.865	11 17 41.91
SUN.	12	11 18 12.66	8.986	4 29 51.8	57.15	3 25.80	0.870	11 21 38.46
Mon.	13	11 21 48.27	8.982	4 6 57.8	−57.34	3 46.74	0.875	11 25 35.02
Tues.	14	11 25 23.78	8.978	3 43 59.6	57.51	4 7.80	0.879	11 29 31.57
Wed.	15	11 28 59.19	8.974	3 20 57.6	57.66	4 28.94	0.882	11 33 28.13
Thur.	16	11 32 34.53	8.972	2 57 52.0	−57.80	4 50.15	0.885	11 37 24.68
Fri.	17	11 36 9.82	8.970	2 34 43.1	57.93	5 11.41	0.886	11 41 21.23
Sat.	18	11 39 45.08	8.969	2 11 31.4	58.04	5 32.70	0.887	11 45 17.79
SUN.	19	11 43 20.33	8.969	1 48 17.1	−58.14	5 54.01	0.887	11 49 14.34
Mon.	20	11 46 55.59	8.970	1 25 0.5	58.23	6 15.30	0.886	11 53 10.89
Tues.	21	11 50 30.89	8.972	1 1 42.0	58.31	6 36.55	0.884	11 57 7.45
Wed.	22	11 54 6.25	8.975	0 38 21.8	−58.37	6 57.75	0.881	12 1 4.00
Thur.	23	11 57 41.70	8.979	N. 0 15 0.3	58.42	7 18.86	0.877	12 5 0.55
Fri.	24	12 1 17.25	8.984	S. 0 8 22.2	58.45	7 39.86	0.872	12 8 57.11
Sat.	25	12 4 52.93	8.990	0 31 45.5	−58.48	8 0.73	0.866	12 12 53.66
SUN.	26	12 8 28.77	8.997	0 55 9.1	58.49	8 21.44	0.859	12 16 50.21
Mon.	27	12 12 4.79	9.005	1 18 32.8	58.48	8 41.98	0.851	12 20 46.77
Tues.	28	12 15 41.01	9.014	1 41 56.3	−58.46	9 2.32	0.843	12 24 43.32
Wed.	29	12 19 17.45	9.024	2 5 19.2	58.43	9 22.42	0.833	12 28 39.87
Thur.	30	12 22 54.14	9.035	2 28 41.1	58.39	9 42.29	0.822	12 32 36.43
Fri.	31	12 26 31.09	9.046	S. 2 52 1.7	−58.33	10 1.89	0.810	12 36 32.98

Note.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that north declinations are decreasing; south declinations increasing.

Diff. for 1 Hour, $+9^{s}.8565$. (Table III.)

C11037

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S True Longitude. λ	THE SUN'S True Longitude. λ′	Diff. for 1 Hour.	Latitude.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	244	157 57 46.4	57 0.5	145.18	+0.55	0.003 9239	−42.0	13 19 32.28
2	245	158 55 51.6	55 5.6	145.26	0.49	0.003 8226	42.5	13 15 36.38
3	246	159 53 58.7	53 12.6	145.34	0.40	0.003 7201	43.0	13 11 40.47
4	247	160 52 7.8	51 21.5	145.42	+0.30	0.003 6162	−43.5	13 7 44.56
5	248	161 50 18.9	49 32.5	145.50	0.19	0.003 5110	44.1	13 3 48.65
6	249	162 48 31.8	47 45.3	145.58	+0.06	0.003 4044	44.7	12 59 52.74
7	250	163 46 46.7	46 0.0	145.66	−0.07	0.003 2963	−45.4	12 55 56.84
8	251	164 45 3.4	44 16.7	145.74	0.21	0.003 1866	46.0	12 52 0.93
9	252	165 43 22.1	42 35.2	145.82	0.33	0.003 0754	46.7	12 48 5.02
10	253	166 41 42.5	40 55.5	145.89	−0.44	0.002 9626	−47.3	12 44 9.11
11	254	167 40 4.6	39 17.6	145.96	0.53	0.002 8483	47.9	12 40 13.20
12	255	168 38 28.5	37 41.3	146.03	0.59	0.002 7325	48.5	12 36 17.30
13	256	169 36 54.0	36 6.7	146.10	−0.62	0.002 6154	−49.0	12 32 21.39
14	257	170 35 21.1	34 33.7	146.16	0.63	0.002 4970	49.5	12 28 25.48
15	258	171 33 49.8	33 2.3	146.23	0.59	0.002 3776	49.9	12 24 29.57
16	259	172 32 20.1	31 32.5	146.30	−0.52	0.002 2574	−50.3	12 20 33.66
17	260	173 30 52.0	30 4.3	146.36	0.42	0.002 1364	50.5	12 16 37.76
18	261	174 29 25.5	28 37.6	146.43	0.30	0.002 0149	50.7	12 12 41.85
19	262	175 28 0.6	27 12.7	146.50	−0.17	0.001 8931	−50.8	12 8 45.94
20	263	176 26 37.5	25 49.4	146.57	−0.03	0.001 7710	50.9	12 4 50.04
21	264	177 25 16.1	24 27.9	146.65	+0.10	0.001 6490	50.9	12 0 54.13
22	265	178 23 56.5	23 8.3	146.73	+0.22	0.001 5269	−50.8	11 56 58.22
23	266	179 22 38.9	21 50.6	146.81	0.33	0.001 4049	50.8	11 53 2.31
24	267	180 21 23.3	20 34.8	146.89	0.41	0.001 2830	50.8	11 49 6.40
25	268	181 20 9.7	19 21.1	146.98	+0.47	0.001 1612	−50.7	11 45 10.50
26	269	182 18 58.2	18 9.6	147.07	0.51	0.001 0395	50.7	11 41 14.59
27	270	183 17 48.9	17 0.1	147.16	0.52	0.000 9179	50.7	11 37 18.68
28	271	184 16 41.8	15 52.9	147.25	+0.50	0.000 7963	−50.6	11 33 22.78
29	272	185 15 37.0	14 48.0	147.34	0.45	0.000 6747	50.6	11 29 26.87
30	273	186 14 34.4	13 45.3	147.44	0.37	0.000 5531	50.7	11 25 30.96
31	274	187 13 34.0	12 44.8	147.54	+0.27	0.000 4312	−50.8	11 21 35.05

NOTE.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour, $-9^s.8296$. (Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 48.5	14 48.3	54 14.99	−0.165	54 14.30	+0.050	18 14.1	2.12	21.5
2	14 48.8	14 50.0	54 16.20	+0.266	54 20.67	0.478	19 5.5	2.15	22.5
3	14 52.0	14 54.5	54 27.64	0.682	54 37.00	0.875	19 56.8	2.12	23.5
4	14 57.6	15 1.4	54 48.58	+1.051	55 2.17	+1.210	20 47.3	2.08	24.5
5	15 5.6	15 10.2	55 17.54	1.349	55 34.45	1.466	21 36.3	2.01	25.5
6	15 15.1	15 20.3	55 52.61	1.556	56 11.68	1.618	22 23.8	1.95	26.5
7	15 25.6	15 31.1	56 31.33	+1.651	56 51.19	+1.654	23 10.0	1.90	27.5
8	15 36.4	15 41.7	57 10.90	1.626	57 30.11	1.570	23 55.7	1.90	28.5
9	15 46.7	15 51.4	57 48.48	1.487	58 5.70	1.380	☌	. .	0.0
10	15 55.7	15 59.5	58 21.51	+1.252	58 35.69	+1.108	0 41.9	1.95	1.0
11	16 2.9	16 5.8	58 48.06	0.953	58 58.53	0.792	1 29.7	2.04	2.0
12	16 8.1	16 9.9	59 7.06	0.630	59 13.66	0.471	2 20.3	2.18	3.0
13	16 11.2	16 12.0	59 18.38	+0.317	59 21.31	+0.172	3 14.5	2.34	4.0
14	16 12.3	16 12.2	59 22.55	+0.036	59 22.23	−0.087	4 12.5	2.49	5.0
15	16 11.8	16 10.9	59 20.50	−0.200	59 17.46	0.305	5 13.7	2.59	6.0
16	16 9.8	16 8.3	59 13.21	−0.402	59 7.84	−0.492	6 16.1	2.59	7.0
17	16 6.6	16 4.5	59 1.42	0.578	58 53.97	0.663	7 17.1	2.48	8.0
18	16 2.2	15 59.6	58 45.50	0.748	58 36.02	0.832	8 14.9	2.32	9.0
19	15 56.8	15 53.6	58 25.54	−0.914	58 14.08	−0.996	9 8.5	2.15	10.0
20	15 50.3	15 46.6	58 1.65	1.076	57 48.26	1.154	9 58.2	2.00	11.0
21	15 42.7	15 38.6	57 33.98	1.224	57 18.91	1.286	10 44.8	1.89	12.0
22	15 34.3	15 29.9	57 3.16	−1.337	56 46.89	−1.373	11 29.3	1.83	13.0
23	15 25.4	15 20.8	56 30.28	1.392	56 13.55	1.393	12 13.0	1.82	14.0
24	15 16.3	15 11.8	55 56.93	1.374	55 40.66	1.333	12 56.7	1.84	15.0
25	15 7.6	15 3.6	55 25.02	−1.270	55 10.26	−1.186	13 41.5	1.89	16.0
26	14 59.8	14 56.5	54 56.64	1.081	54 44.40	0.956	14 27.8	1.97	17.0
27	14 53.6	14 51.2	54 33.78	0.811	54 25.01	0.648	15 15.9	2.04	18.0
28	14 49.4	14 48.2	54 18.28	−0.471	54 13.76	−0.281	16 5.7	2.10	19.0
29	14 47.6	14 47.6	54 11.59	−0.080	54 11.88	+0.130	16 56.6	2.13	20.0
30	14 48.4	14 49.9	54 14.73	+0.345	54 20.17	0.561	17 47.6	2.11	21.0
31	14 52.1	14 55.0	54 28.20	+0.777	54 38.81	+0.990	18 37.9	2.07	22.0

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 1.					FRIDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	4 15 19.41	2.1778	N. 26 18 8.5	4.323	0	6 1 47.17	2.2358	N. 27 16 46.1	1.965
1	4 17 30.15	2.1803	26 22 24.2	4.199	1	6 4 1.31	2.2355	27 14 44.2	2.099
2	4 19 41.04	2.1827	26 26 32.4	4.074	2	6 6 15.43	2.2352	27 12 34.2	2.233
3	4 21 52.07	2.1850	26 30 33.1	3.949	3	6 8 29.53	2.2348	27 10 16.2	2.367
4	4 24 3.24	2.1873	26 34 26.3	3.824	4	6 10 43.61	2.2343	27 7 50.2	2.501
5	4 26 14.55	2.1896	26 38 12.0	3.699	5	6 12 57.65	2.2338	27 5 16.1	2.635
6	4 28 25.99	2.1918	26 41 50.2	3.573	6	6 15 11.66	2.2332	27 2 34.0	2.768
7	4 30 37.57	2.1941	26 45 20.7	3.446	7	6 17 25.63	2.2325	26 59 43.9	2.902
8	4 32 49.28	2.1963	26 48 43.7	3.320	8	6 19 39.56	2.2318	26 56 45.8	3.035
9	4 35 1.12	2.1983	26 51 59.1	3.193	9	6 21 53.44	2.2309	26 53 39.7	3.168
10	4 37 13.08	2.2004	26 55 6.8	3.064	10	6 24 7.27	2.2301	26 50 25.6	3.302
11	4 39 25.17	2.2024	26 58 6.8	2.936	11	6 26 21.05	2.2292	26 47 3.5	3.434
12	4 41 37.37	2.2043	27 0 59.1	2.808	12	6 28 34.78	2.2283	26 43 33.5	3.567
13	4 43 49.69	2.2062	27 3 43.7	2.679	13	6 30 48.45	2.2273	26 39 55.5	3.699
14	4 46 2.12	2.2081	27 6 20.6	2.550	14	6 33 2.05	2.2262	26 36 9.6	3.832
15	4 48 14.66	2.2099	27 8 49.7	2.421	15	6 35 15.59	2.2251	26 32 15.7	3.964
16	4 50 27.31	2.2117	27 11 11.1	2.291	16	6 37 29.06	2.2238	26 28 13.9	4.096
17	4 52 40.06	2.2133	27 13 24.6	2.161	17	6 39 42.45	2.2226	26 24 4.2	4.225
18	4 54 52.91	2.2150	27 15 30.4	2.031	18	6 41 55.77	2.2213	26 19 46.6	4.358
19	4 57 5.86	2.2166	27 17 28.3	1.899	19	6 44 9.01	2.2200	26 15 21.2	4.489
20	4 59 18.90	2.2181	27 19 18.3	1.768	20	6 46 22.17	2.2186	26 10 47.9	4.620
21	5 1 32.03	2.2196	27 21 0.5	1.638	21	6 48 35.24	2.2172	26 6 6.8	4.751
22	5 3 45.25	2.2210	27 22 34.9	1.507	22	6 50 48.23	2.2157	26 1 17.8	4.882
23	5 5 58.55	2.2223	N. 27 24 1.3	1.374	23	6 53 1.12	2.2141	N. 25 56 21.0	5.011
	THURSDAY 2.					SATURDAY 4.			
0	5 8 11.93	2.2236	N. 27 25 19.8	1.243	0	6 55 13.92	2.2125	N. 25 51 16.5	5.140
1	5 10 25.38	2.2248	27 26 30.4	1.111	1	6 57 26.62	2.2108	25 46 4.2	5.269
2	5 12 38.91	2.2261	27 27 33.1	0.978	2	6 59 39.22	2.2092	25 40 44.2	5.398
3	5 14 52.51	2.2272	27 28 27.8	0.846	3	7 1 51.72	2.2074	25 35 16.4	5.527
4	5 17 6.17	2.2283	27 29 14.6	0.713	4	7 4 4.11	2.2057	25 29 40.9	5.655
5	5 19 19.90	2.2293	27 29 53.4	0.580	5	7 6 16.40	2.2038	25 23 57.8	5.783
6	5 21 33.68	2.2301	27 30 24.2	0.447	6	7 8 28.57	2.2019	25 18 7.0	5.910
7	5 23 47.51	2.2309	27 30 47.1	0.314	7	7 10 40.63	2.2000	25 12 8.6	6.036
8	5 26 1.39	2.2317	27 31 1.9	0.180	8	7 12 52.57	2.1981	25 6 2.7	6.16
9	5 28 15.32	2.2325	27 31 8.7	+0.047	9	7 15 4.40	2.1962	24 59 49.1	6.2
10	5 30 29.29	2.2332	27 31 7.5	−0.087	10	7 17 16.11	2.1941	24 53 28.0	6.414
11	5 32 43.30	2.2338	27 30 58.3	0.221	11	7 19 27.69	2.1920	24 46 59.4	6.539
12	5 34 57.35	2.2344	27 30 41.0	0.355	12	7 21 39.15	2.1900	24 40 23.3	6.66
13	5 37 11.43	2.2348	27 30 15.7	0.488	13	7 23 50.49	2.1878	24 33 39.7	6.7
14	5 39 25.53	2.2352	27 29 42.4	0.623	14	7 26 1.69	2.1856	24 26 48.7	6.91
15	5 41 39.65	2.2355	27 29 1.0	0.757	15	7 28 12.76	2.1834	24 19 50.3	7.034
16	5 43 53.79	2.2358	27 28 11.6	0.891	16	7 30 23.70	2.1812	24 12 44.6	7.157
17	5 46 7.95	2.2361	27 27 14.1	1.025	17	7 32 34.50	2.1789	24 5 31.5	7.2
18	5 48 22.12	2.2363	27 26 8.6	1.159	18	7 34 45.17	2.1767	23 58 11.0	7.4
19	5 50 36.30	2.2363	27 24 55.0	1.294	19	7 36 55.70	2.1743	23 50 43.3	7.5
20	5 52 50.48	2.2363	27 23 33.3	1.428	20	7 39 6.09	2.1720	23 43 8.4	7.64
21	5 55 4.66	2.2363	27 22 3.6	1.563	21	7 41 16.34	2.1697	23 35 26.2	7.76
22	5 57 18.84	2.2363	27 20 25.8	1.697	22	7 43 26.45	2.1673	23 27 36.8	7.88
23	5 59 33.01	2.2361	27 18 40.0	1.831	23	7 45 36.41	2.1648	23 19 40.3	8.00
24	6 1 47.17	2.2358	N. 27 16 46.1	1.965	24	7 47 46.23	2.1624	N. 23 11 36.7	8.11

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 5.			
	h m s	s	° ′ ″	″
0	7 47 46.23	2.1624	N. 23 11 36.7	8.119
1	7 49 55.90	2.1600	23 3 26.0	8.237
2	7 52 5.43	2.1576	22 55 8.2	8.354
3	7 54 14.81	2.1550	22 46 43.5	8.470
4	7 56 24.03	2.1525	22 38 11.8	8.587
5	7 58 33.11	2.1501	22 29 33.1	8.702
6	8 0 42.04	2.1476	22 20 47.6	8.816
7	8 2 50.82	2.1450	22 11 55.2	8.930
8	8 4 59.44	2.1424	22 2 56.0	9.043
9	8 7 7.91	2.1399	21 53 50.0	9.156
10	8 9 16.23	2.1374	21 44 37.3	9.268
11	8 11 24.40	2.1348	21 35 17.9	9.379
12	8 13 32.41	2.1323	21 25 51.8	9.490
13	8 15 40.27	2.1297	21 16 19.1	9.599
14	8 17 47.97	2.1271	21 6 39.9	9.708
15	8 19 55.52	2.1246	20 56 54.1	9.817
16	8 22 2.92	2.1220	20 47 1.8	9.925
17	8 24 10.16	2.1194	20 37 3.1	10.032
18	8 26 17.25	2.1168	20 26 58.0	10.138
19	8 28 24.18	2.1143	20 16 46.6	10.243
20	8 30 30.96	2.1118	20 6 28.8	10.348
21	8 32 37.59	2.1092	19 56 4.8	10.452
22	8 34 44.06	2.1066	19 45 34.6	10.555
23	8 36 50.38	2.1041	N. 19 34 58.2	10.657
	MONDAY 6.			
0	8 38 56.55	2.1016	N. 19 24 15.7	10.759
1	8 41 2.57	2.0991	19 13 27.1	10.860
2	8 43 8.44	2.0966	19 2 32.5	10.960
3	8 45 14.16	2.0941	18 51 31.9	11.059
4	8 47 19.73	2.0916	18 40 25.4	11.158
5	8 49 25.15	2.0892	18 29 13.0	11.256
6	8 51 30.43	2.0867	18 17 54.7	11.353
7	8 53 35.56	2.0843	18 6 30.7	11.448
8	8 55 40.55	2.0820	17 55 0.9	11.543
9	8 57 45.40	2.0796	17 43 25.5	11.637
10	8 59 50.10	2.0772	17 31 44.4	11.731
11	9 1 54.66	2.0748	17 19 57.8	11.823
12	9 3 59.08	2.0726	17 8 5.6	11.916
13	9 6 3.37	2.0703	16 56 7.9	12.007
14	9 8 7.52	2.0680	16 44 4.8	12.096
15	9 10 11.53	2.0658	16 31 56.4	12.185
16	9 12 15.41	2.0637	16 19 42.6	12.273
17	9 14 19.17	2.0615	16 7 23.6	12.360
18	9 16 22.79	2.0593	15 54 59.4	12.447
19	9 18 26.29	2.0572	15 42 30.0	12.533
20	9 20 29.66	2.0551	15 29 55.5	12.617
21	9 22 32.90	2.0531	15 17 16.0	12.700
22	9 24 36.03	2.0512	15 4 31.5	12.783
23	9 26 39.04	2.0492	14 51 42.0	12.865
24	9 28 41.93	2.0472	N. 14 38 47.7	12.945

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 7.			
	h m s	s	° ′ ″	″
0	9 28 41.93	2.0472	N. 14 38 47.7	12.945
1	9 30 44.71	2.0453	14 25 48.6	13.025
2	9 32 47.37	2.0435	14 12 44.7	13.104
3	9 34 49.93	2.0417	13 59 36.1	13.182
4	9 36 52.37	2.0398	13 46 22.8	13.259
5	9 38 54.71	2.0382	13 33 5.0	13.334
6	9 40 56.95	2.0365	13 19 42.7	13.409
7	9 42 59.09	2.0348	13 6 15.9	13.484
8	9 45 1.13	2.0333	12 52 44.6	13.557
9	9 47 3.08	2.0317	12 39 9.0	13.629
10	9 49 4.93	2.0302	12 25 29.1	13.700
11	9 51 6.70	2.0288	12 11 45.0	13.770
12	9 53 8.38	2.0273	11 57 56.7	13.839
13	9 55 9.98	2.0259	11 44 4.3	13.907
14	9 57 11.49	2.0246	11 30 7.9	13.973
15	9 59 12.93	2.0233	11 16 7.5	14.039
16	10 1 14.29	2.0221	11 2 3.2	14.104
17	10 3 15.58	2.0209	10 47 55.0	14.168
18	10 5 16.80	2.0198	10 33 43.0	14.231
19	10 7 17.96	2.0188	10 19 27.3	14.293
20	10 9 19.06	2.0178	10 5 7.9	14.353
21	10 11 20.10	2.0168	9 50 44.9	14.413
22	10 13 21.08	2.0158	9 36 18.4	14.471
23	10 15 22.00	2.0150	N. 9 21 48.4	14.528
	WEDNESDAY 8.			
0	10 17 22.88	2.0142	N. 9 7 15.0	14.584
1	10 19 23.71	2.0135	8 52 38.3	14.639
2	10 21 24.50	2.0128	8 37 58.3	14.693
3	10 23 25.25	2.0122	8 23 15.1	14.746
4	10 25 25.97	2.0117	8 8 28.8	14.798
5	10 27 26.65	2.0111	7 53 39.4	14.848
6	10 29 27.30	2.0107	7 38 47.0	14.898
7	10 31 27.93	2.0103	7 23 51.6	14.947
8	10 33 28.54	2.0100	7 8 53.3	14.994
9	10 35 29.13	2.0097	6 53 52.3	15.039
10	10 37 29.70	2.0095	6 38 48.6	15.085
11	10 39 30.27	2.0094	6 23 42.1	15.129
12	10 41 30.83	2.0093	6 8 33.1	15.171
13	10 43 31.39	2.0093	5 53 21.6	15.212
14	10 45 31.95	2.0093	5 38 7.6	15.252
15	10 47 32.51	2.0094	5 22 51.3	15.291
16	10 49 33.08	2.0097	5 7 32.7	15.329
17	10 51 33.67	2.0099	4 52 11.8	15.366
18	10 53 34.27	2.0102	4 36 48.8	15.401
19	10 55 34.89	2.0106	4 21 23.7	15.436
20	10 57 35.54	2.0111	4 5 56.5	15.469
21	10 59 36.22	2.0116	3 50 27.4	15.500
22	11 1 36.93	2.0121	3 34 56.5	15.530
23	11 3 37.67	2.0128	3 19 23.8	15.559
24	11 5 38.46	2.0136	N. 3 3 49.4	15.587

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 9.					SATURDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	11 5 38.46	2.0136	N. 3 3 49.4	15.587	0	12 44 28.55	2.1327	S. 9 31 0.4	15.314
1	11 7 39.30	2.0143	2 48 13.3	15.614	1	12 46 36.64	2.1369	9 46 18.0	15.272
2	11 9 40.18	2.0152	2 32 35.7	15.639	2	12 48 44.98	2.1412	10 1 33.0	15.228
3	11 11 41.12	2.0161	2 16 56.6	15.663	3	12 50 53.58	2.1456	10 16 45.4	15.183
4	11 13 42.11	2.0170	2 1 16.1	15.686	4	12 53 2.45	2.1501	10 31 55.0	15.136
5	11 15 43.16	2.0181	1 45 34.3	15.708	5	12 55 11.59	2.1546	10 47 1.7	15.087
6	11 17 44.28	2.0193	1 29 51.2	15.728	6	12 57 21.00	2.1592	11 2 5.4	15.037
7	11 19 45.47	2.0205	1 14 6.9	15.748	7	12 59 30.69	2.1638	11 17 6.1	14.985
8	11 21 46.74	2.0218	0 58 21.5	15.765	8	13 1 40.66	2.1685	11 32 3.6	14.932
9	11 23 48.08	2.0231	0 42 35.1	15.781	9	13 3 50.91	2.1733	11 46 57.9	14.877
10	11 25 49.51	2.0245	0 26 47.8	15.796	10	13 6 1.45	2.1782	12 1 48.8	14.820
11	11 27 51.02	2.0260	N. 0 10 59.6	15.810	11	13 8 12.29	2.1831	12 16 36.3	14.762
12	11 29 52.63	2.0276	S. 0 4 49.4	15.822	12	13 10 23.42	2.1880	12 31 20.2	14.702
13	11 31 54.33	2.0292	0 20 39.1	15.833	13	13 12 34.85	2.1930	12 46 0.5	14.640
14	11 33 56.13	2.0309	0 36 29.4	15.842	14	13 14 46.58	2.1981	13 0 37.0	14.576
15	11 35 58.04	2.0327	0 52 20.2	15.850	15	13 16 58.62	2.2033	13 15 9.6	14.511
16	11 38 0.05	2.0345	1 8 11.4	15.857	16	13 19 10.97	2.2085	13 29 38.3	14.444
17	11 40 2.18	2.0365	1 24 3.1	15.863	17	13 21 23.64	2.2137	13 44 2.9	14.376
18	11 42 4.43	2.0385	1 39 55.0	15.867	18	13 23 36.62	2.2190	13 58 23.4	14.306
19	11 44 6.80	2.0406	1 55 47.1	15.870	19	13 25 49.92	2.2244	14 12 39.6	14.233
20	11 46 9.30	2.0427	2 11 39.4	15.872	20	13 28 3.55	2.2298	14 26 51.4	14.160
21	11 48 11.92	2.0448	2 27 31.7	15.872	21	13 30 17.50	2.2353	14 40 58.8	14.085
22	11 50 14.68	2.0472	2 43 24.0	15.870	22	13 32 31.78	2.2408	14 55 1.6	14.008
23	11 52 17.58	2.0496	S. 2 59 16.1	15.867	23	13 34 46.39	2.2463	S. 15 8 59.8	13.930
	FRIDAY 10.					SUNDAY 12.			
0	11 54 20.63	2.0520	S. 3 15 8.0	15.863	0	13 37 1.34	2.2519	S. 15 22 53.2	13.849
1	11 56 23.82	2.0545	3 30 59.6	15.857	1	13 39 16.62	2.2576	15 36 41.7	13.768
2	11 58 27.17	2.0572	3 46 50.8	15.850	2	13 41 32.25	2.2633	15 50 25.3	13.684
3	12 0 30.68	2.0598	4 2 41.6	15.842	3	13 43 48.22	2.2690	16 4 3.8	13.598
4	12 2 34.35	2.0626	4 18 31.8	15.831	4	13 46 4.53	2.2748	16 17 37.1	13.511
5	12 4 38.19	2.0653	4 34 21.3	15.819	5	13 48 21.19	2.2806	16 31 5.1	13.422
6	12 6 42.19	2.0682	4 50 10.1	15.807	6	13 50 38.20	2.2865	16 44 27.7	13.332
7	12 8 46.37	2.0712	5 5 58.1	15.793	7	13 52 55.57	2.2924	16 57 44.9	13.240
8	12 10 50.73	2.0742	5 21 45.2	15.777	8	13 55 13.29	2.2983	17 10 56.5	13.146
9	12 12 55.28	2.0773	5 37 31.3	15.759	9	13 57 31.37	2.3043	17 24 2.4	13.050
10	12 15 0.01	2.0805	5 53 16.3	15.740	10	13 59 49.81	2.3103	17 37 2.5	12.952
11	12 17 4.94	2.0838	6 9 0.1	15.719	11	14 2 8.60	2.3163	17 49 56.7	12.853
12	12 19 10.07	2.0872	6 24 42.6	15.697	12	14 4 27.76	2.3223	18 2 44.9	12.752
13	12 21 15.40	2.0905	6 40 23.8	15.674	13	14 6 47.28	2.3284	18 15 27.0	12.650
14	12 23 20.93	2.0939	6 56 3.5	15.649	14	14 9 7.17	2.3345	18 28 2.9	12.546
15	12 25 26.67	2.0975	7 11 41.7	15.622	15	14 11 27.42	2.3406	18 40 32.5	12.439
16	12 27 32.63	2.1012	7 27 18.2	15.594	16	14 13 48.04	2.3467	18 52 55.6	12.332
17	12 29 38.81	2.1048	7 42 53.0	15.564	17	14 16 9.03	2.3529	19 5 12.3	12.223
18	12 31 45.21	2.1086	7 58 25.9	15.533	18	14 18 30.39	2.3591	19 17 22.4	12.112
19	12 33 51.84	2.1124	8 13 57.0	15.502	19	14 20 52.12	2.3653	19 29 25.7	11.998
20	12 35 58.70	2.1163	8 29 26.1	15.467	20	14 23 14.22	2.3714	19 41 22.2	11.884
21	12 38 5.80	2.1203	8 44 53.0	15.431	21	14 25 36.69	2.3777	19 53 11.8	11.768
22	12 40 13.14	2.1243	9 0 17.8	15.394	22	14 27 59.54	2.3838	20 4 54.4	11.651
23	12 42 20.72	2.1284	9 15 40.3	15.355	23	14 30 22.75	2.3900	20 16 29.9	11.531
24	12 44 28.55	2.1327	S. 9 31 0.4	15.314	24	14 32 46.34	2.3962	S. 20 27 58.1	11.409

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.				Diff. for 1 Min.
MONDAY 13.									
	h	m	s	s		°	′	″	″
0	14	32	46.34	2.3962	S.	20	27	58.1	11.409
1	14	35	10.30	2.4024		20	39	19.0	11.287
2	14	37	34.63	2.4086		20	50	32.5	11.163
3	14	39	59.33	2.4148		21	1	38.5	11.037
4	14	42	24.41	2.4210		21	12	36.9	10.908
5	14	44	49.85	2.4271		21	23	27.5	10.778
6	14	47	15.66	2.4333		21	34	10.3	10.647
7	14	49	41.84	2.4393		21	44	45.2	10.515
8	14	52	8.38	2.4454		21	55	12.1	10.381
9	14	54	35.29	2.4516		22	5	30.9	10.244
10	14	57	2.57	2.4577		22	15	41.4	10.107
11	14	59	30.21	2.4636		22	25	43.7	9.968
12	15	1	58.20	2.4695		22	35	37.6	9.827
13	15	4	26.55	2.4755		22	45	23.0	9.685
14	15	6	55.26	2.4814		22	54	59.8	9.542
15	15	9	24.32	2.4873		23	4	28.0	9.397
16	15	11	53.73	2.4931		23	13	47.4	9.250
17	15	14	23.49	2.4988		23	22	58.0	9.102
18	15	16	53.59	2.5045		23	31	59.6	8.952
19	15	19	24.03	2.5102		23	40	52.2	8.801
20	15	21	54.81	2.5158		23	49	35.7	8.648
21	15	24	25.92	2.5213		23	58	10.0	8.494
22	15	26	57.36	2.5268		24	6	35.0	8.338
23	15	29	29.13	2.5322	S.	24	14	50.6	8.182
TUESDAY 14.									
0	15	32	1.22	2.5375	S.	24	22	56.8	8.024
1	15	34	33.63	2.5427		24	30	53.5	7.865
2	15	37	6.35	2.5479		24	38	40.6	7.703
3	15	39	39.38	2.5530		24	46	17.9	7.541
4	15	42	12.71	2.5579		24	53	45.5	7.378
5	15	44	46.33	2.5628		25	1	3.3	7.213
6	15	47	20.25	2.5677		25	8	11.1	7.048
7	15	49	54.46	2.5725		25	15	9.0	6.881
8	15	52	28.95	2.5771		25	21	56.8	6.713
9	15	55	3.71	2.5816		25	28	34.5	6.543
10	15	57	38.74	2.5860		25	35	1.9	6.372
11	16	0	14.03	2.5903		25	41	19.1	6.201
12	16	2	49.58	2.5946		25	47	26.0	6.028
13	16	5	25.38	2.5987		25	53	22.5	5.854
14	16	8	1.42	2.6027		25	59	8.5	5.679
15	16	10	37.70	2.6066		26	4	44.0	5.504
16	16	13	14.21	2.6103		26	10	9.0	5.327
17	16	15	50.94	2.6140		26	15	23.3	5.149
18	16	18	27.89	2.6175		26	20	26.9	4.971
19	16	21	5.04	2.6208		26	25	19.8	4.792
20	16	23	42.39	2.6241		26	30	1.9	4.611
21	16	26	19.93	2.6272		26	34	33.1	4.430
22	16	28	57.65	2.6302		26	38	53.5	4.249
23	16	31	35.55	2.6331		26	43	3.0	4.067
24	16	34	13.62	2.6358	S.	26	47	1.5	3.883

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.				Diff. for 1 Min.
WEDNESDAY 15.									
	h	m	s	s		°	′	″	″
0	16	34	13.62	2.6358	S.	26	47	1.5	3.883
1	16	36	51.84	2.6383		26	50	49.0	3.699
2	16	39	30.22	2.6408		26	54	25.4	3.514
3	16	42	8.74	2.6431		26	57	50.7	3.329
4	16	44	47.39	2.6452		27	1	4.9	3.144
5	16	47	26.16	2.6472		27	4	8.0	2.958
6	16	50	5.05	2.6490		27	6	59.9	2.772
7	16	52	44.04	2.6507		27	9	40.6	2.585
8	16	55	23.13	2.6523		27	12	10.1	2.397
9	16	58	2.31	2.6537		27	14	28.3	2.209
10	17	0	41.57	2.6549		27	16	35.2	2.021
11	17	3	20.90	2.6559		27	18	30.8	1.833
12	17	6	0.28	2.6568		27	20	15.2	1.645
13	17	8	39.71	2.6576		27	21	48.2	1.455
14	17	11	19.19	2.6582		27	23	9.8	1.266
15	17	13	58.69	2.6585		27	24	20.1	1.077
16	17	16	38.21	2.6588		27	25	19.0	0.888
17	17	19	17.75	2.6590		27	26	6.6	0.698
18	17	21	57.29	2.6589		27	26	42.8	0.509
19	17	24	36.82	2.6587		27	27	7.7	0.320
20	17	27	16.33	2.6583		27	27	21.2	−0.131
21	17	29	55.82	2.6578		27	27	23.4	+0.058
22	17	32	35.27	2.6571		27	27	14.2	0.248
23	17	35	14.67	2.6563	S.	27	26	53.7	0.437
THURSDAY 16.									
0	17	37	54.02	2.6553	S.	27	26	21.8	0.626
1	17	40	33.31	2.6542		27	25	38.6	0.814
2	17	43	12.52	2.6528		27	24	44.1	1.002
3	17	45	51.64	2.6513		27	23	38.3	1.190
4	17	48	30.67	2.6497		27	22	21.3	1.377
5	17	51	9.60	2.6479		27	20	53.1	1.564
6	17	53	48.42	2.6459		27	19	13.6	1.752
7	17	56	27.11	2.6438		27	17	22.9	1.938
8	17	59	5.68	2.6417		27	15	21.1	2.123
9	18	1	44.11	2.6393		27	13	8.2	2.308
10	18	4	22.39	2.6367		27	10	44.2	2.493
11	18	7	0.51	2.6340		27	8	9.1	2.677
12	18	9	38.47	2.6312		27	5	23.0	2.860
13	18	12	16.25	2.6282		27	2	25.9	3.042
14	18	14	53.85	2.6250		26	59	17.9	3.224
15	18	17	31.25	2.6218		26	55	59.0	3.405
16	18	20	8.46	2.6184		26	52	29.3	3.585
17	18	22	45.46	2.6148		26	48	48.8	3.765
18	18	25	22.24	2.6112		26	44	57.5	3.944
19	18	27	58.80	2.6074		26	40	55.5	4.122
20	18	30	35.13	2.6035		26	36	42.9	4.298
21	18	33	11.22	2.5995		26	32	19.7	4.474
22	18	35	47.07	2.5953		26	27	46.0	4.649
23	18	38	22.66	2.5910		26	23	1.8	4.823
24	18	40	57.99	2.5866	S.	26	18	7.2	4.997

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 17.					SUNDAY 19.			
h	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	18 40 57.99	2.5866	S. 26 18 7.2	4.997	0	20 38 32.49	2.2961	S. 19 23 40.1	11.706
1	18 43 33.05	2.5821	26 13 2.2	5.168	1	20 40 50.06	2.2896	19 11 54.7	11.806
2	18 46 7.84	2.5775	26 7 47.0	5.338	2	20 43 7.24	2.2832	19 0 3.2	11.906
3	18 48 42.35	2.5727	26 2 21.6	5.508	3	20 45 24.04	2.2768	18 48 5.8	12.006
4	18 51 16.57	2.5678	25 56 46.0	5.677	4	20 47 40.45	2.2703	18 36 2.5	12.103
5	18 53 50.49	2.5629	25 51 0.3	5.845	5	20 49 56.47	2.2638	18 23 53.4	12.198
6	18 56 24.12	2.5579	25 45 4.6	6.011	6	20 52 12.11	2.2575	18 11 38.7	12.292
7	18 58 57.44	2.5527	25 38 59.0	6.176	7	20 54 27.37	2.2511	17 59 18.4	12.384
8	19 1 30.45	2.5475	25 32 43.5	6.340	8	20 56 42.24	2.2448	17 46 52.6	12.475
9	19 4 3.14	2.5422	25 26 18.2	6.503	9	20 58 56.74	2.2385	17 34 21.4	12.564
10	19 6 35.51	2.5368	25 19 43.2	6.663	10	21 1 10.86	2.2323	17 21 44.9	12.652
11	19 9 7.55	2.5313	25 12 58.6	6.823	11	21 3 24.61	2.2261	17 9 3.2	12.738
12	19 11 39.26	2.5257	25 6 4.4	6.982	12	21 5 37.99	2.2199	16 56 16.4	12.821
13	19 14 10.63	2.5200	24 59 0.7	7.140	13	21 7 51.00	2.2138	16 43 24.7	12.903
14	19 16 41.66	2.5143	24 51 47.6	7.295	14	21 10 3.65	2.2077	16 30 28.0	12.985
15	19 19 12.35	2.5085	24 44 25.3	7.449	15	21 12 15.93	2.2017	16 17 26.5	13.064
16	19 21 42.68	2.5026	24 36 53.7	7.603	16	21 14 27.85	2.1957	16 4 20.3	13.142
17	19 24 12.66	2.4967	24 29 12.9	7.756	17	21 16 39.42	2.1898	15 51 9.5	13.218
18	19 26 42.28	2.4906	24 21 23.0	7.906	18	21 18 50.63	2.1839	15 37 54.2	13.293
19	19 29 11.53	2.4845	24 13 24.2	8.054	19	21 21 1.49	2.1781	15 24 34.4	13.366
20	19 31 40.42	2.4785	24 5 16.5	8.202	20	21 23 12.00	2.1723	15 11 10.3	13.437
21	19 34 8.95	2.4723	23 57 0.0	8.348	21	21 25 22.17	2.1666	14 57 42.0	13.507
22	19 36 37.10	2.4660	23 48 34.8	8.493	22	21 27 31.99	2.1609	14 44 9.5	13.576
23	19 39 4.87	2.4598	S. 23 40 0.9	8.637	23	21 29 41.48	2.1553	S. 14 30 32.9	13.643
	SATURDAY 18.					MONDAY 20.			
0	19 41 32.27	2.4535	S. 23 31 18.4	8.778	0	21 31 50.63	2.1498	S. 14 16 52.4	13.708
1	19 43 59.29	2.4472	23 22 27.5	8.918	1	21 33 59.45	2.1443	14 3 8.0	13.772
2	19 46 25.93	2.4408	23 13 28.3	9.056	2	21 36 7.94	2.1388	13 49 19.8	13.834
3	19 48 52.18	2.4343	23 4 20.8	9.193	3	21 38 16.11	2.1334	13 35 27.9	13.895
4	19 51 18.04	2.4278	22 55 5.1	9.329	4	21 40 23.95	2.1281	13 21 32.4	13.954
5	19 53 43.52	2.4213	22 45 41.3	9.463	5	21 42 31.48	2.1228	13 7 33.4	14.012
6	19 56 8.60	2.4148	22 36 9.5	9.595	6	21 44 38.69	2.1176	12 53 31.0	14.068
7	19 58 33.29	2.4083	22 26 29.9	9.726	7	21 46 45.59	2.1125	12 39 25.3	14.123
8	20 0 57.59	2.4018	22 16 42.4	9.856	8	21 48 52.19	2.1074	12 25 16.3	14.177
9	20 3 21.50	2.3952	22 6 47.2	9.983	9	21 50 58.48	2.1023	12 11 4.1	14.228
10	20 5 45.01	2.3885	21 56 44.4	10.109	10	21 53 4.47	2.0974	11 56 48.9	14.278
11	20 8 8.12	2.3819	21 46 34.1	10.233	11	21 55 10.17	2.0926	11 42 30.7	14.327
12	20 10 30.84	2.3753	21 36 16.4	10.356	12	21 57 15.58	2.0878	11 28 9.6	14.375
13	20 12 53.16	2.3687	21 25 51.4	10.477	13	21 59 20.70	2.0830	11 13 45.7	14.420
14	20 15 15.08	2.3621	21 15 19.1	10.597	14	22 1 25.54	2.0783	10 59 19.1	14.465
15	20 17 36.61	2.3555	21 4 39.7	10.715	15	22 3 30.10	2.0737	10 44 49.9	14.506
16	20 19 57.74	2.3488	20 53 53.3	10.832	16	22 5 34.38	2.0691	10 30 18.2	14.548
17	20 22 18.47	2.3422	20 42 59.9	10.947	17	22 7 38.39	2.0647	10 15 44.0	14.590
18	20 24 38.80	2.3356	20 31 59.7	11.060	18	22 9 42.14	2.0602	10 1 7.4	14.628
19	20 26 58.74	2.3290	20 20 52.7	11.172	19	22 11 45.62	2.0558	9 46 28.5	14.666
20	20 29 18.28	2.3223	20 9 39.1	11.281	20	22 13 48.84	2.0516	9 31 47.4	14.702
21	20 31 37.42	2.3157	19 58 19.0	11.389	21	22 15 51.81	2.0474	9 17 4.1	14.736
22	20 33 56.17	2.3092	19 46 52.4	11.497	22	22 17 54.53	2.0433	9 2 18.8	14.772
23	20 36 14.53	2.3027	19 35 19.4	11.603	23	22 19 57.00	2.0392	8 47 31.6	14.806
24	20 38 32.49	2.2961	S. 19 23 40.1	11.706	24	22 21 59.23	2.0352	S. 8 32 42.5	14.838

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 21.					THURSDAY 23.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	22 21 59.23	2.0352	S. 8 32 42.5	14.833	0	23 56 26.44	1.9277	N. 3 30 17.2	14.833
1	22 24 1.22	2.0313	8 17 51.6	14.862	1	23 58 22.09	1.9272	3 45 6.4	14.806
2	22 26 2.98	2.0274	8 2 59.0	14.891	2	0 0 17.71	1.9267	3 59 53.9	14.777
3	22 28 4.51	2.0236	7 48 4.7	14.918	3	0 2 13.30	1.9263	4 14 39.6	14.747
4	22 30 5.81	2.0199	7 33 8.9	14.942	4	0 4 8.87	1.9260	4 29 23.5	14.716
5	22 32 6.90	2.0163	7 18 11.7	14.966	5	0 6 4.42	1.9258	4 44 5.5	14.683
6	22 34 7.77	2.0128	7 3 13.0	14.989	6	0 7 59.96	1.9256	4 58 45.5	14.650
7	22 36 8.43	2.0093	6 48 13.0	15.010	7	0 9 55.49	1.9254	5 13 23.5	14.617
8	22 38 8.88	2.0058	6 33 11.8	15.030	8	0 11 51.01	1.9253	5 27 59.5	14.583
9	22 40 9.13	2.0024	6 18 9.4	15.048	9	0 13 46.53	1.9253	5 42 33.4	14.546
10	22 42 9.17	1.9991	6 3 6.0	15.066	10	0 15 42.05	1.9253	5 57 5.0	14.508
11	22 44 9.02	1.9960	5 48 1.5	15.083	11	0 17 37.57	1.9254	6 11 34.4	14.471
12	22 46 8.69	1.9929	5 32 56.1	15.097	12	0 19 33.10	1.9256	6 26 1.5	14.432
13	22 48 8.17	1.9898	5 17 49.9	15.110	13	0 21 28.64	1.9258	6 40 26.2	14.392
14	22 50 7.46	1.9868	5 2 42.9	15.122	14	0 23 24.20	1.9262	6 54 48.5	14.351
15	22 52 6.58	1.9839	4 47 35.2	15.133	15	0 25 19.78	1.9266	7 9 8.3	14.308
16	22 54 5.53	1.9811	4 32 26.9	15.143	16	0 27 15.39	1.9270	7 23 25.5	14.265
17	22 56 4.31	1.9783	4 17 18.1	15.151	17	0 29 11.02	1.9274	7 37 40.1	14.222
18	22 58 2.92	1.9756	4 2 8.8	15.158	18	0 31 6.68	1.9279	7 51 52.1	14.177
19	23 0 1.38	1.9730	3 46 59.1	15.164	19	0 33 2.37	1.9285	8 6 1.3	14.131
20	23 1 59.68	1.9704	3 31 49.1	15.169	20	0 34 58.10	1.9292	8 20 7.8	14.084
21	23 3 57.83	1.9679	3 16 38.8	15.173	21	0 36 53.87	1.9299	8 34 11.4	14.037
22	23 5 55.83	1.9655	3 1 28.3	15.176	22	0 38 49.69	1.9307	8 48 12.2	13.988
23	23 7 53.69	1.9632	S. 2 46 17.7	15.177	23	0 40 45.55	1.9315	N. 9 2 10.0	13.938
	WEDNESDAY 22.					FRIDAY 24.			
0	23 9 51.41	1.9609	S. 2 31 7.1	15.176	0	0 42 41.47	1.9324	N. 9 16 4.8	13.887
1	23 11 49.00	1.9588	2 15 56.6	15.175	1	0 44 37.44	1.9333	9 29 56.5	13.836
2	23 13 46.46	1.9567	2 0 46.1	15.173	2	0 46 33.47	1.9343	9 43 45.1	13.784
3	23 15 43.80	1.9546	1 45 35.8	15.169	3	0 48 29.56	1.9353	9 57 30.6	13.731
4	23 17 41.01	1.9526	1 30 25.8	15.164	4	0 50 25.71	1.9364	10 11 12.8	13.677
5	23 19 38.11	1.9507	1 15 16.1	15.158	5	0 52 21.93	1.9376	10 24 51.8	13.622
6	23 21 35.10	1.9488	1 0 6.8	15.152	6	0 54 18.22	1.9388	10 38 27.4	13.565
7	23 23 31.97	1.9470	0 44 57.9	15.143	7	0 56 14.58	1.9400	10 51 59.6	13.508
8	23 25 28.74	1.9454	0 29 49.6	15.133	8	0 58 11.02	1.9413	11 5 28.3	13.450
9	23 27 25.42	1.9438	S. 0 14 41.9	15.123	9	1 0 7.54	1.9427	11 18 53.6	13.392
10	23 29 22.00	1.9422	N. 0 0 25.2	15.112	10	1 2 4.14	1.9441	11 32 15.3	13.332
11	23 31 18.48	1.9407	0 15 31.6	15.099	11	1 4 0.83	1.9456	11 45 33.4	13.272
12	23 33 14.88	1.9393	0 30 37.1	15.085	12	1 5 57.61	1.9471	11 58 47.9	13.210
13	23 35 11.20	1.9380	0 45 41.8	15.070	13	1 7 54.48	1.9486	12 11 58.6	13.148
14	23 37 7.44	1.9368	1 0 45.5	15.053	14	1 9 51.44	1.9502	12 25 5.6	13.084
15	23 39 3.61	1.9356	1 15 48.2	15.037	15	1 11 48.50	1.9518	12 38 8.7	13.020
16	23 40 59.71	1.9344	1 30 49.9	15.019	16	1 13 45.66	1.9536	12 51 8.0	12.956
17	23 42 55.74	1.9333	1 45 50.5	14.999	17	1 15 42.93	1.9553	13 4 3.4	12.890
18	23 44 51.71	1.9323	2 0 49.8	14.978	18	1 17 40.30	1.9571	13 16 54.8	12.823
19	23 46 47.62	1.9313	2 15 47.9	14.957	19	1 19 37.78	1.9589	13 29 42.2	12.756
20	23 48 43.47	1.9305	2 30 44.6	14.934	20	1 21 35.37	1.9608	13 42 25.5	12.687
21	23 50 39.28	1.9297	2 45 40.0	14.912	21	1 23 33.07	1.9627	13 55 4.6	12.618
22	23 52 35.04	1.9290	3 0 34.0	14.887	22	1 25 30.89	1.9647	14 7 39.6	12.548
23	23 54 30.76	1.9283	3 15 26.4	14.860	23	1 27 28.83	1.9667	14 20 10.3	12.477
24	23 56 26.44	1.9277	N. 3 30 17.2	14.833	24	1 29 26.89	1.9688	N. 14 32 36.8	12.405

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 25.			
	h m s	s	° ′ ″	″
0	1 29 26.89	1.9688	N. 14 32 36.8	12.405
1	1 31 25.08	1.9708	14 44 58.9	12.333
2	1 33 23.39	1.9729	14 57 16.7	12.259
3	1 35 21.83	1.9751	15 9 30.0	12.184
4	1 37 20.40	1.9773	15 21 38.8	12.109
5	1 39 19.10	1.9795	15 33 43.1	12.033
6	1 41 17.94	1.9818	15 45 42.8	11.957
7	1 43 16.92	1.9842	15 57 37.9	11.879
8	1 45 16.04	1.9865	16 9 28.3	11.801
9	1 47 15.30	1.9888	16 21 14.0	11.722
10	1 49 14.70	1.9912	16 32 54.9	11.641
11	1 51 14.25	1.9937	16 44 30.9	11.560
12	1 53 13.94	1.9961	16 56 2.1	11.479
13	1 55 13.78	1.9987	17 7 28.4	11.397
14	1 57 13.78	2.0012	17 18 49.7	11.313
15	1 59 13.93	2.0037	17 30 6.0	11.229
16	2 1 14.23	2.0063	17 41 17.2	11.144
17	2 3 14.69	2.0090	17 52 23.3	11.059
18	2 5 15.31	2.0116	18 3 24.3	10.973
19	2 7 16.08	2.0142	18 14 20.1	10.886
20	2 9 17.01	2.0169	18 25 10.6	10.798
21	2 11 18.11	2.0197	18 35 55.8	10.709
22	2 13 19.37	2.0224	18 46 35.7	10.620
23	2 15 20.80	2.0252	N. 18 57 10.2	10.530
	SUNDAY 26.			
0	2 17 22.39	2.0279	N. 19 7 39.3	10.439
1	2 19 24.15	2.0307	19 18 2.9	10.347
2	2 21 26.07	2.0335	19 28 21.0	10.255
3	2 23 28.17	2.0364	19 38 33.5	10.162
4	2 25 30.44	2.0392	19 48 40.4	10.068
5	2 27 32.87	2.0420	19 58 41.6	9.973
6	2 29 35.48	2.0449	20 8 37.1	9.878
7	2 31 38.26	2.0478	20 18 26.9	9.782
8	2 33 41.21	2.0507	20 28 10.9	9.685
9	2 35 44.34	2.0536	20 37 49.1	9.587
10	2 37 47.64	2.0565	20 47 21.4	9.489
11	2 39 51.12	2.0594	20 56 47.8	9.391
12	2 41 54.77	2.0623	21 6 8.3	9.291
13	2 43 58.60	2.0653	21 15 22.7	9.190
14	2 46 2.61	2.0683	21 24 31.1	9.089
15	2 48 6.79	2.0712	21 33 33.4	8.987
16	2 50 11.15	2.0741	21 42 29.6	8.885
17	2 52 15.68	2.0770	21 51 19.6	8.782
18	2 54 20.39	2.0800	22 0 3.5	8.679
19	2 56 25.28	2.0830	22 8 41.1	8.574
20	2 58 30.35	2.0859	22 17 12.4	8.469
21	3 0 35.59	2.0888	22 25 37.4	8.364
22	3 2 41.01	2.0918	22 33 56.1	8.258
23	3 4 46.60	2.0947	22 42 8.3	8.150
24	3 6 52.37	2.0976	N. 22 50 14.1	8.043

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 27.			
	h m s	s	° ′ ″	″
0	3 6 52.37	2.0976	N. 22 50 14.1	8.043
1	3 8 58.31	2.1005	22 58 13.4	7.935
2	3 11 4.43	2.1034	23 6 6.3	7.827
3	3 13 10.72	2.1063	23 13 52.6	7.717
4	3 15 17.19	2.1092	23 21 32.3	7.607
5	3 17 23.83	2.1121	23 29 5.4	7.496
6	3 19 30.64	2.1149	23 36 31.8	7.384
7	3 21 37.62	2.1178	23 43 51.5	7.272
8	3 23 44.77	2.1206	23 51 4.5	7.160
9	3 25 52.09	2.1234	23 58 10.7	7.047
10	3 27 59.58	2.1262	24 5 10.1	6.933
11	3 30 7.23	2.1289	24 12 2.7	6.819
12	3 32 15.05	2.1317	24 18 48.4	6.704
13	3 34 23.03	2.1344	24 25 27.2	6.589
14	3 36 31.18	2.1372	24 31 59.1	6.473
15	3 38 39.49	2.1398	24 38 24.0	6.357
16	3 40 47.96	2.1424	24 44 41.9	6.240
17	3 42 56.58	2.1450	24 50 52.8	6.122
18	3 45 5.36	2.1477	24 56 56.6	6.004
19	3 47 14.30	2.1503	25 2 53.3	5.886
20	3 49 23.39	2.1528	25 8 42.9	5.767
21	3 51 32.63	2.1553	25 14 25.3	5.648
22	3 53 42.02	2.1577	25 20 0.6	5.528
23	3 55 51.55	2.1601	N. 25 25 28.7	5.407
	TUESDAY 28.			
0	3 58 1.23	2.1625	N. 25 30 49.5	5.286
1	4 0 11.05	2.1649	25 36 3.0	5.165
2	4 2 21.02	2.1672	25 41 9.3	5.044
3	4 4 31.12	2.1695	25 46 8.3	4.922
4	4 6 41.36	2.1717	25 50 59.9	4.798
5	4 8 51.73	2.1739	25 55 44.1	4.675
6	4 11 2.23	2.1761	26 0 20.9	4.552
7	4 13 12.86	2.1782	26 4 50.3	4.428
8	4 15 23.62	2.1803	26 9 12.3	4.303
9	4 17 34.50	2.1823	26 13 26.7	4.178
10	4 19 45.50	2.1843	26 17 33.7	4.054
11	4 21 56.62	2.1863	26 21 33.2	3.928
12	4 24 7.86	2.1882	26 25 25.1	3.803
13	4 26 19.21	2.1901	26 29 9.5	3.677
14	4 28 30.67	2.1918	26 32 46.3	3.550
15	4 30 42.23	2.1936	26 36 15.5	3.423
16	4 32 53.90	2.1953	26 39 37.1	3.296
17	4 35 5.67	2.1970	26 42 51.0	3.168
18	4 37 17.54	2.1986	26 45 57.3	3.041
19	4 39 29.50	2.2002	26 48 55.9	2.913
20	4 41 41.56	2.2017	26 51 46.8	2.784
21	4 43 53.70	2.2030	26 54 30.0	2.656
22	4 46 5.92	2.2044	26 57 5.5	2.527
23	4 48 18.23	2.2058	26 59 33.2	2.398
24	4 50 30.62	2.2071	N. 27 1 53.2	2.268

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

our.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 29.			
	h m s	s	° ′ ″	″
0	4 50 30.62	2.2071	N. 27 1 53.2	2.268
1	4 52 43.08	2.2083	27 4 5.4	2.139
2	4 54 55.62	2.2095	27 6 9.9	2.010
3	4 57 8.22	2.2106	27 8 6.6	1.880
4	4 59 20.89	2.2117	27 9 55.5	1.749
5	5 1 33.62	2.2126	27 11 36.5	1.618
6	5 3 46.40	2.2135	27 13 9.7	1.488
7	5 5 59.24	2.2144	27 14 35.1	1.358
8	5 8 12.13	2.2152	27 15 52.6	1.227
9	5 10 25.07	2.2160	27 17 2.3	1.096
10	5 12 38.05	2.2167	27 18 4.1	0.964
11	5 14 51.07	2.2173	27 18 58.0	0.833
12	5 17 4.12	2.2178	27 19 44.1	0.702
13	5 19 17.21	2.2184	27 20 22.3	0.571
14	5 21 30.33	2.2188	27 20 52.6	0.439
15	5 23 43.47	2.2192	27 21 15.0	0.308
16	5 25 56.64	2.2196	27 21 29.5	0.176
17	5 28 9.82	2.2198	27 21 36.1	+0.044
18	5 30 23.01	2.2200	27 21 34.8	−0.087
19	5 32 36.22	2.2202	27 21 25.6	0.219
20	5 34 49.44	2.2203	27 21 8.5	0.351
21	5 37 2.66	2.2203	27 20 43.5	0.483
22	5 39 15.88	2.2203	27 20 10.6	0.614
23	5 41 29.09	2.2202	N. 27 19 29.8	0.746
	THURSDAY 30.			
0	5 43 42.30	2.2201	N. 27 18 41.1	0.878
1	5 45 55.50	2.2198	27 17 44.4	1.010
2	5 48 8.68	2.2195	27 16 39.9	1.141
3	5 50 21.84	2.2192	27 15 27.5	1.273
4	5 52 34.98	2.2188	27 14 7.2	1.405
5	5 54 48.09	2.2183	27 12 38.9	1.537
6	5 57 1.18	2.2179	27 11 2.8	1.668
7	5 59 14.24	2.2173	27 9 18.8	1.798
8	6 1 27.26	2.2167	27 7 27.0	1.929
9	6 3 40.24	2.2160	27 5 27.3	2.061
10	6 5 53.18	2.2153	27 3 19.7	2.192
11	6 8 6.07	2.2145	27 1 4.3	2.323
12	6 10 18.92	2.2137	26 58 41.0	2.453
13	6 12 31.71	2.2128	26 56 9.9	2.583
14	6 14 44.45	2.2118	26 53 31.0	2.713
15	6 16 57.13	2.2108	26 50 44.3	2.843
16	6 19 9.74	2.2097	26 47 49.8	2.973
17	6 21 22.29	2.2086	26 44 47.5	3.103
18	6 23 34.77	2.2074	26 41 37.4	3.233
19	6 25 47.18	2.2062	26 38 19.6	3.362
20	6 27 59.51	2.2049	26 34 54.0	3.491
21	6 30 11.77	2.2037	26 31 20.7	3.619
22	6 32 23.95	2.2023	26 27 39.7	3.748
23	6 34 36.04	2.2008	26 23 50.9	3.877
24	6 36 48.05	2.1994	N. 26 19 54.5	4.004

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY, OCTOBER 1.			
	h m s	s	° ′ ″	″
0	6 36 48.05	2.1994	N. 26 19 54.5	4.004

PHASES OF THE MOON.

			d	h	m
☾	Last Quarter	Sept.	1	2	56.6
●	New Moon		8	22	52.7
☽	First Quarter		15	19	21.3
○	Full Moon		22	21	35.2
☾	Last Quarter		30	21	44.3

			d	h
☾	Apogee	Sept.	1	9.2
☾	Perigee		14	3.3
☾	Apogee		29	4.8

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.	Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hou
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Fri.	1	12 26 29.58	9.044	S. 2 51 52.0	−58.31	16 0.55	64.27	10 1.75	0.81
Sat.	2	12 30 6.77	9.056	3 15 10.6	58.24	16 0.82	64.31	10 21.06	0.79
SUN.	3	12 33 44.28	9.069	3 38 27.3	58.15	16 1.09	64.36	10 40.06	0.78
Mon.	4	12 37 22.10	9.084	4 1 41.6	−58.04	16 1.36	64.41	10 58.73	0.77
Tues.	5	12 41 0.28	9.099	4 24 53.2	57.92	16 1.63	64.46	11 17.06	0.75
Wed.	6	12 44 38.83	9.114	4 48 1.7	57.78	16 1.90	64.51	11 35.02	0.74
Thur.	7	12 48 17.76	9.130	5 11 6.7	−57.63	16 2.18	64.57	11 52.60	0.72
Fri.	8	12 51 57.09	9.147	5 34 7.8	57.46	16 2.46	64.63	12 9.77	0.70
Sat.	9	12 55 36.83	9.165	5 57 4.6	57.27	16 2.73	64.69	12 26.53	0.68
SUN.	10	12 59 17.01	9.183	6 19 56.7	−57.06	16 3.01	64.76	12 42.86	0.67
Mon.	11	13 2 57.63	9.202	6 42 43.7	56.84	16 3.29	64.83	12 58.75	0.65
Tues.	12	13 6 38.72	9.222	7 5 25.2	56.61	16 3.57	64.90	13 14.18	0.63
Wed.	13	13 10 20.28	9.242	7 28 0.9	−56.36	16 3.85	64.97	13 29.13	0.61
Thur.	14	13 14 2.33	9.263	7 50 30.3	56.09	16 4.13	65.05	13 43.59	0.59
Fri.	15	13 17 44.90	9.285	8 12 53.0	55.80	16 4.41	65.13	13 57.54	0.57
Sat.	16	13 21 27.98	9.307	8 35 8.7	−55.50	16 4.70	65.21	14 10.97	0.54
SUN.	17	13 25 11.62	9.330	8 57 17.0	55.19	16 4.99	65.29	14 23.86	0.52
Mon.	18	13 28 55.82	9.354	9 19 17.6	54.86	16 5.27	65.38	14 36.18	0.50
Tues.	19	13 32 40.60	9.379	9 41 10.0	−54.51	16 5.54	65.47	14 47.92	0.47
Wed.	20	13 36 25.98	9.404	10 2 54.0	54.15	16 5.81	65.56	14 59.06	0.45
Thur.	21	13 40 11.99	9.430	10 24 29.2	53.77	16 6.08	65.65	15 9.58	0.42
Fri.	22	13 43 58.64	9.457	10 45 55.1	−53.38	16 6.35	65.75	15 19.45	0.39
Sat.	23	13 47 45.95	9.485	11 7 11.4	52.97	16 6.62	65.85	15 28.67	0.37
SUN.	24	13 51 33.95	9.514	11 28 17.8	52.55	16 6.88	65.95	15 37.21	0.34
Mon.	25	13 55 22.64	9.544	11 49 13.9	−52.11	16 7.14	66.05	15 45.06	0.31
Tues.	26	13 59 12.04	9.574	12 9 59.3	51.66	16 7.41	66.15	15 52.18	0.28
Wed.	27	14 3 2.18	9.605	12 30 33.5	51.19	16 7.67	66.26	15 58.58	0.25
Thur.	28	14 6 53.06	9.636	12 50 56.3	−50.70	16 7.93	66.36	16 4.24	0.21
Fri.	29	14 10 44.71	9.668	13 11 7.1	50.20	16 8.18	66.47	16 9.13	0.18
Sat.	30	14 14 37.14	9.701	13 31 5.7	49.68	16 8.43	66.58	16 13.25	0.15
SUN.	31	14 18 30.35	9.734	13 50 51.6	49.14	16 8.67	66.69	16 16.58	0.12
Mon.	32	14 22 24.37	9.768	S. 14 10 24.3	−48.58	16 8.92	66.80	16 19.11	0.08

Note.—The mean time of semidiameter passing the meridian may be found by subtracting $0^s.18$ from the sidereal time.

The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

ay of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
ri.	1	12 26 31.09	9.046	S. 2 52 1.7	−58.33	10 1.89	0.810	12 36 32.98
at.	2	12 30 8.34	9.058	3 15 20.7	58.25	10 21.20	0.798	12 40 29.53
UN.	3	12 33 45.89	9.071	3 38 37.7	58.16	10 40.20	0.785	12 44 26.09
on.	4	12 37 23.77	9.085	4 1 52.3	−58.05	10 58.87	0.771	12 48 22.64
ues.	5	12 41 2.00	9.100	4 25 4.1	57.93	11 17.20	0.756	12 52 19.20
ed.	6	12 44 40.59	9.116	4 48 12.9	57.79	11 35.16	0.740	12 56 15.75
hur.	7	12 48 19.56	9.132	5 11 18.1	−57.64	11 52.74	0.724	13 0 12.30
ri.	8	12 51 58.94	9.149	5 34 19.4	57.47	12 9.91	0.707	13 4 8.86
at.	9	12 55 38.73	9.167	5 57 16.4	57.28	12 26.68	0.689	13 8 5.41
UN.	10	12 59 18.96	9.185	6 20 8.8	−57.07	12 43.01	0.671	13 12 1.96
on.	11	13 2 59.62	9.204	6 42 56.0	56.85	12 58.89	0.652	13 15 58.52
ues.	12	13 6 40.75	9.224	7 5 37.7	56.61	13 14.32	0.633	13 19 55.07
ed.	13	13 10 22.36	9.244	7 28 13.5	−56.36	13 29.27	0.613	13 23 51.62
hur.	14	13 14 4.45	9.265	7 50 43.1	56.09	13 43.73	0.592	13 27 48.18
ri.	15	13 17 47.06	9.286	8 13 6.0	55.81	13 57.68	0.570	13 31 44.73
at.	16	13 21 30.18	9.308	8 35 21.8	−55.51	14 11.10	0.548	13 35 41.29
UN.	17	13 25 13.86	9.331	8 57 30.2	55.19	14 23.98	0.525	13 39 37.84
on.	18	13 28 58.09	9.355	9 19 30.9	54.86	14 36.30	0.501	13 43 34.40
ues.	19	13 32 42.91	9.380	9 41 23.5	−54.51	14 48.04	0.476	13 47 30.95
ed.	20	13 36 28.33	9.406	10 3 7.5	54.14	14 59.17	0.451	13 51 27.50
hur.	21	13 40 14.38	9.432	10 24 42.8	53.76	15 9.68	0.425	13 55 24.06
ri.	22	13 44 1.06	9.459	10 46 8.7	−53.38	15 19.56	0.398	13 59 20.61
at.	23	13 47 48.40	9.487	11 7 25.1	52.98	15 28.77	0.370	14 3 17.17
UN.	24	13 51 36.42	9.515	11 28 31.5	52.55	15 37.30	0.341	14 7 13.72
on.	25	13 55 25.14	9.545	11 49 27.6	−52.11	15 45.14	0.312	14 11 10.28
ues.	26	13 59 14.57	9.575	12 10 12.9	51.66	15 52.26	0.282	14 15 6.83
ed.	27	14 3 4.74	9.606	12 30 47.2	51.18	15 58.65	0.251	14 19 3.39
hur.	28	14 6 55.65	9.637	12 51 9.8	−50.69	16 4.30	0.219	14 22 59.94
ri.	29	14 10 47.32	9.669	13 11 20.6	50.19	16 9.18	0.187	14 26 56.50
at.	30	14 14 39.76	9.702	13 31 19.1	49.67	16 13.29	0.155	14 30 53.05
UN.	31	14 18 32.99	9.735	13 51 4.9	49.13	16 16.62	0.122	14 34 49.61
on.	32	14 22 27.02	9.768	S. 14 10 37.5	−48.57	16 19.14	0.088	14 38 46.16

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign — prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour, $+9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S True Longitude. λ	THE SUN'S True Longitude. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S Latitude.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	274	187 13 34.0	12 44.8	147.54	+0.27	0.000 4312	−50.8	11 21 35.0
2	275	188 12 36.0	11 46.7	147.63	0.17	0.000 3092	50.9	11 17 39.1
3	276	189 11 40.3	10 50.9	147.73	+0.05	0.000 1869	51.0	11 13 43.2
4	277	190 10 46.9	9 57.4	147.82	−0.08	0.000 0643	−51.2	11 9 47.3
5	278	191 9 55.7	9 6.1	147.92	0.22	9.999 9413	51.4	11 5 51.4
6	279	192 9 6.8	8 17.1	148.01	0.35	9.999 8178	51.6	11 1 55.5
7	280	193 8 20.1	7 30.3	148.10	−0.45	9.999 6937	−51.8	10 57 59.6
8	281	194 7 35.6	6 45.6	148.19	0.53	9.999 5691	52.0	10 54 3.7
9	282	195 6 53.1	6 3.0	148.27	0.59	9.999 4439	52.3	10 50 7.7
10	283	196 6 12.6	5 22.5	148.35	−0.63	9.999 3182	−52.5	10 46 11.8
11	284	197 5 34.1	4 43.8	148.43	0.64	9.999 1919	52.7	10 42 15.9
12	285	198 4 57.4	4 7.0	148.51	0.61	9.999 0653	52.8	10 38 20.0
13	286	199 4 22.5	3 32.0	148.59	−0.55	9.998 9384	−52.9	10 34 24.1
14	287	200 3 49.4	2 58.8	148.66	0.46	9.998 8115	52.9	10 30 28.2
15	288	201 3 18.0	2 27.3	148.73	0.34	9.998 6847	52.8	10 26 32.3
16	289	202 2 48.4	1 57.5	148.80	−0.21	9.998 5582	−52.6	10 22 36.4
17	290	203 2 20.4	1 29.4	148.87	−0.08	9.998 4322	52.4	10 18 40.5
18	291	204 1 54.2	1 3.1	148.95	+0.05	9.998 3068	52.1	10 14 44.6
19	292	205 1 29.8	0 38.6	149.02	+0.18	9.998 1823	−51.7	10 10 48.7
20	293	206 1 7.2	0 15.8	149.10	0.29	9.998 0587	51.3	10 6 52.8
21	294	206 60 46.4	59 55.0	149.18	0.37	9.997 9361	50.8	10 2 56.8
22	295	207 60 27.6	59 36.0	149.26	+0.43	9.997 8146	−50.3	9 59 0.9
23	296	208 60 10.8	59 19.0	149.34	0.47	9.997 6943	49.9	9 55 5.0
24	297	209 59 55.9	59 4.1	149.42	0.48	9.997 5752	49.4	9 51 9.1
25	298	210 59 43.1	58 51.2	149.51	+0.46	9.997 4572	−48.9	9 47 13.2
26	299	211 59 32.4	58 40.3	149.60	0.42	9.997 3404	48.4	9 43 17.3
27	300	212 59 23.8	58 31.6	149.69	0.36	9.997 2248	48.0	9 39 21.4
28	301	213 59 17.4	58 25.0	149.78	+0.27	9.997 1102	−47.5	9 35 25.5
29	302	214 59 13.0	58 20.5	149.87	0.17	9.996 9968	47.1	9 31 29.6
30	303	215 59 10.9	58 18.3	149.96	+0.06	9.996 8844	46.7	9 27 33.7
31	304	216 59 10.9	58 18.2	150.05	−0.07	9.996 7729	46.3	9 23 37.8
32	305	217 59 13.1	58 20.2	150.14	−0.20	9.996 6623	−45.9	9 19 41.8

Note.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,
—9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	14 52.1	14 55.0	54 28.20	+0.777	54 38.81	+0.990	18 37.9	2.07	22.0
2	14 58.6	15 2.8	54 51.94	1.196	55 7.46	1.388	19 26.8	2.01	23.0
3	15 7.6	15 13.0	55 25.19	1.564	55 44.92	1.720	20 14.3	1.95	24.0
4	15 18.9	15 25.1	56 6.38	+1.851	56 29.23	+1.951	21 0.5	1.91	25.0
5	15 31.6	15 38.2	56 53.08	2.018	57 17.51	2.047	21 46.3	1.91	26.0
6	15 44.9	15 51.5	57 42.04	2.034	58 6.15	1.978	22 32.5	1.95	27.0
7	15 57.8	16 3.7	58 29.33	+1.878	58 51.06	+1.736	23 20.2	2.04	28.0
8	16 9.1	16 13.8	59 10.84	1.554	59 28.21	1.336	6	. .	29.0
9	16 17.8	16 21.0	59 42.80	1.091	59 54.32	0.826	0 10.7	2.18	0.6
0	16 23.2	16 24.6	60 2.59	+0.550	60 7.52	+0.272	1 5.0	2.35	1.6
1	16 25.0	16 24.6	60 9.15	+0.002	60 7.63	−0.251	2 3.5	2.52	2.6
2	16 23.4	16 21.5	60 3.20	−0.483	59 56.13	0.691	3 5.6	2.63	3.6
3	16 18.9	16 15.8	59 46.74	−0.868	59 35.43	−1.012	4 9.2	2.64	4.6
4	16 12.3	16 8.5	59 22.56	1.128	59 8.47	1.215	5 11.6	2.54	5.6
5	16 4.4	16 0.2	58 53.49	1.277	58 37.90	1.317	6 10.6	2.37	6.6
6	15 55.8	15 51.4	58 21.95	−1.339	58 5.81	−1.349	7 5.0	2.18	7.6
17	15 47.0	15 42.6	57 49.63	1.346	57 33.55	1.333	7 55.1	2.00	8.6
18	15 38.3	15 34.0	57 17.65	1.317	57 1.96	1.298	8 41.7	1.88	9.6
19	15 29.8	15 25.6	56 46.50	−1.277	56 31.32	−1.252	9 26.0	1.81	10.6
20	15 21.6	15 17.6	56 16.46	1.224	56 1.95	1.194	10 9.2	1.79	11.6
21	15 13.8	15 10.1	55 47.81	1.162	55 34.09	1.123	10 52.3	1.81	12.6
22	15 6.5	15 3.0	55 20.88	−1.077	55 8.27	−1.023	11 36.3	1.86	13.6
23	14 59.8	14 56.8	54 56.37	0.959	54 45.29	0.885	12 21.9	1.94	14.6
24	14 54.0	14 51.6	54 35.19	0.797	54 26.22	0.696	13 9.4	2.02	15.6
25	14 49.5	14 47.8	54 18.53	−0.582	54 12.30	−0.454	13 58.7	2.08	16.6
26	14 46.5	14 45.8	54 7.70	−0.311	54 4.90	−0.155	14 49.3	2.12	17.6
27	14 45.5	14 45.9	54 4.04	+0.014	54 5.28	+0.195	15 40.1	2.10	18.6
28	14 46.8	14 48.4	54 8.75	+0.385	54 14.56	+0.585	16 30.2	2.06	19.6
29	14 50.6	14 53.6	54 22.81	0.791	54 33.55	1.000	17 18.9	2.00	20.6
30	14 57.2	15 1.5	54 46.80	1.208	55 2.54	1.414	18 6.0	1.92	21.6
31	15 6.4	15 12.0	55 20.71	1.612	55 41.19	1.799	18 51.5	1.88	22.6
32	15 18.2	15 24.8	56 3.82	+1.969	56 28.35	+2.115	19 36.3	1.86	23.6

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

FRIDAY 1.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	6 36 48.05	2.1994	N. 26 19 54.5	4.004
1	6 38 59.97	2.1979	26 15 50.4	4.132
2	6 41 11.80	2.1963	26 11 38.7	4.259
3	6 43 23.53	2.1947	26 7 19.3	4.386
4	6 45 35.16	2.1931	26 2 52.4	4.513
5	6 47 46.70	2.1914	25 58 17.8	4.639
6	6 49 58.13	2.1897	25 53 35.7	4.765
7	6 52 9.46	2.1879	25 48 46.0	4.892
8	6 54 20.68	2.1862	25 43 48.7	5.017
9	6 56 31.80	2.1843	25 38 44.0	5.141
10	6 58 42.80	2.1824	25 33 31.8	5.266
11	7 0 53.69	2.1805	25 28 12.1	5.391
12	7 3 4.46	2.1786	25 22 44.9	5.515
13	7 5 15.12	2.1767	25 17 10.3	5.638
14	7 7 25.66	2.1746	25 11 28.4	5.760
15	7 9 36.07	2.1725	25 5 39.1	5.883
16	7 11 46.36	2.1705	24 59 42.4	6.006
17	7 13 56.53	2.1684	24 53 38.4	6.127
18	7 16 6.57	2.1663	24 47 27.1	6.248
19	7 18 16.49	2.1642	24 41 8.6	6.369
20	7 20 26.27	2.1619	24 34 42.8	6.490
21	7 22 35.92	2.1598	24 28 9.8	6.611
22	7 24 45.44	2.1576	24 21 29.5	6.731
23	7 26 54.83	2.1553	N. 24 14 42.1	6.849

SATURDAY 2.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	7 29 4.08	2.1531	N. 24 7 47.6	6.968
1	7 31 13.20	2.1508	24 0 46.0	7.086
2	7 33 22.18	2.1485	23 53 37.3	7.204
3	7 35 31.02	2.1462	23 46 21.5	7.322
4	7 37 39.72	2.1438	23 38 58.7	7.438
5	7 39 48.28	2.1415	23 31 28.9	7.554
6	7 41 56.70	2.1392	23 23 52.2	7.669
7	7 44 4.98	2.1368	23 16 8.6	7.784
8	7 46 13.11	2.1343	23 8 18.1	7.899
9	7 48 21.10	2.1320	23 0 20.7	8.013
10	7 50 28.95	2.1297	22 52 16.5	8.127
11	7 52 36.66	2.1273	22 44 5.5	8.240
12	7 54 44.22	2.1248	22 35 47.7	8.352
13	7 56 51.64	2.1224	22 27 23.2	8.464
14	7 58 58.91	2.1200	22 18 52.0	8.575
15	8 1 6.04	2.1176	22 10 14.2	8.686
16	8 3 13.02	2.1152	22 1 29.7	8.796
17	8 5 19.86	2.1128	21 52 38.7	8.905
18	8 7 26.56	2.1104	21 43 41.1	9.014
19	8 9 33.11	2.1080	21 34 37.0	9.123
20	8 11 39.52	2.1056	21 25 26.4	9.231
21	8 13 45.78	2.1032	21 16 9.3	9.338
22	8 15 51.90	2.1007	21 6 45.9	9.444
23	8 17 57.87	2.0983	20 57 16.0	9.551
24	8 20 3.70	2.0960	N. 20 47 39.8	9.656

SUNDAY 3.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	8 20 3.70	2.0960	N. 20 47 39.8	[illegible]
1	8 22 9.39	2.0937	20 37 57.3	[illegible]
2	8 24 14.94	2.0913	20 28 8.6	[illegible]
3	8 26 20.35	2.0890	20 18 13.6	[illegible]
4	8 28 25.62	2.0867	20 8 12.4	[illegible]
5	8 30 30.75	2.0843	19 58 5.1	[illegible]
6	8 32 35.74	2.0820	19 47 51.7	[illegible]
7	8 34 40.59	2.0798	19 37 32.2	[illegible]
8	8 36 45.31	2.0775	19 27 6.7	[illegible]
9	8 38 49.89	2.0753	19 16 35.3	[illegible]
10	8 40 54.34	2.0731	19 5 57.9	[illegible]
11	8 42 58.66	2.0709	18 55 14.5	[illegible]
12	8 45 2.85	2.0688	18 44 25.3	[illegible]
13	8 47 6.91	2.0666	18 33 30.3	[illegible]
14	8 49 10.84	2.0644	18 22 29.5	[illegible]
15	8 51 14.64	2.0623	18 11 23.0	[illegible]
16	8 53 18.32	2.0603	18 0 10.8	[illegible]
17	8 55 21.88	2.0583	17 48 52.9	[illegible]
18	8 57 25.31	2.0562	17 37 29.4	[illegible]
19	8 59 28.62	2.0543	17 26 0.4	[illegible]
20	9 1 31.82	2.0523	17 14 25.8	[illegible]
21	9 3 34.90	2.0504	17 2 45.8	[illegible]
22	9 5 37.87	2.0485	16 51 0.3	[illegible]
23	9 7 40.72	2.0466	N. 16 39 9.5	11.890

MONDAY 4.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	9 9 43.46	2.0448	N. 16 27 13.3	11.981
1	9 11 46.09	2.0430	16 15 11.8	12.068
2	9 13 48.62	2.0413	16 3 5.1	12.155
3	9 15 51.05	2.0397	15 50 53.2	12.241
4	9 17 53.38	2.0380	15 38 36.1	12.328
5	9 19 55.61	2.0363	15 26 13.9	12.413
6	9 21 57.74	2.0347	15 13 46.6	12.497
7	9 23 59.78	2.0332	15 1 14.3	12.579
8	9 26 1.72	2.0317	14 48 37.1	12.662
9	9 28 3.58	2.0302	14 35 54.9	12.743
10	9 30 5.35	2.0288	14 23 7.9	12.823
11	9 32 7.04	2.0275	14 10 16.1	12.903
12	9 34 8.65	2.0262	13 57 19.5	12.983
13	9 36 10.18	2.0249	13 44 18.2	13.061
14	9 38 11.64	2.0237	13 31 12.2	13.138
15	9 40 13.02	2.0224	13 18 1.6	13.215
16	9 42 14.33	2.0213	13 4 46.4	13.291
17	9 44 15.58	2.0203	12 51 26.7	13.366
18	9 46 16.77	2.0193	12 38 2.5	13.440
19	9 48 17.89	2.0183	12 24 33.9	13.513
20	9 50 18.96	2.0174	12 11 0.9	13.585
21	9 52 19.98	2.0165	11 57 23.7	13.656
22	9 54 20.94	2.0156	11 43 42.2	13.727
23	9 56 21.85	2.0148	11 29 56.5	13.797
24	9 58 22.72	2.0142	N. 11 16 6.6	13.865

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

TUESDAY 5.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	9 58 22.72	2.0142	N. 11 16 6.6	13.865
1	10 0 23.55	2.0135	11 2 12.7	13.932
2	10 2 24.34	2.0129	10 48 14.7	13.999
3	10 4 25.10	2.0123	10 34 12.8	14.065
4	10 6 25.82	2.0118	10 20 6.9	14.130
5	10 8 26.52	2.0114	10 5 57.2	14.193
6	10 10 27.19	2.0110	9 51 43.7	14.257
7	10 12 27.84	2.0108	9 37 26.4	14.318
8	10 14 28.48	2.0105	9 23 5.5	14.379
9	10 16 29.10	2.0103	9 8 40.9	14.440
10	10 18 29.71	2.0102	8 54 12.7	14.499
11	10 20 30.32	2.0102	8 39 41.0	14.557
12	10 22 30.93	2.0102	8 25 5.9	14.613
13	10 24 31.54	2.0102	8 10 27.4	14.670
14	10 26 32.15	2.0103	7 55 45.5	14.725
15	10 28 32.78	2.0106	7 41 0.4	14.778
16	10 30 33.42	2.0108	7 26 12.1	14.832
17	10 32 34.07	2.0111	7 11 20.6	14.883
18	10 34 34.75	2.0115	6 56 26.1	14.934
19	10 36 35.45	2.0119	6 41 28.5	14.985
20	10 38 36.18	2.0124	6 26 27.9	15.033
21	10 40 36.94	2.0130	6 11 24.5	15.081
22	10 42 37.74	2.0137	5 56 18.2	15.128
23	10 44 38.58	2.0143	N. 5 41 9.2	15.173

WEDNESDAY 6.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	10 46 39.46	2.0151	N. 5 25 57.5	15.217
1	10 48 40.39	2.0160	5 10 43.2	15.260
2	10 50 41.38	2.0170	4 55 26.3	15.302
3	10 52 42.43	2.0180	4 40 7.0	15.343
4	10 54 43.54	2.0190	4 24 45.2	15.383
5	10 56 44.71	2.0201	4 9 21.1	15.421
6	10 58 45.95	2.0213	3 53 54.7	15.458
7	11 0 47.27	2.0226	3 38 26.1	15.494
8	11 2 48.66	2.0239	3 22 55.4	15.529
9	11 4 50.14	2.0254	3 7 22.6	15.563
10	11 6 51.71	2.0269	2 51 47.8	15.596
11	11 8 53.37	2.0284	2 36 11.1	15.627
12	11 10 55.12	2.0301	2 20 32.6	15.657
13	11 12 56.98	2.0318	2 4 52.3	15.686
14	11 14 58.94	2.0336	1 49 10.3	15.713
15	11 17 1.01	2.0354	1 33 26.7	15.739
16	11 19 3.19	2.0373	1 17 41.6	15.764
17	11 21 5.49	2.0394	1 1 55.0	15.788
18	11 23 7.92	2.0415	0 46 7.1	15.809
19	11 25 10.47	2.0436	0 30 17.9	15.831
20	11 27 13.15	2.0458	N. 0 14 27.4	15.851
21	11 29 15.97	2.0482	S. 0 1 24.2	15.869
22	11 31 18.93	2.0506	0 17 16.9	15.886
23	11 33 22.04	2.0531	0 33 10.5	15.901
24	11 35 25.30	2.0556	S. 0 49 5.0	15.915

THURSDAY 7.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	11 35 25.30	2.0556	S. 0 49 5.0	15.915
1	11 37 28.71	2.0582	1 5 0.3	15.928
2	11 39 32.28	2.0609	1 20 56.4	15.940
3	11 41 36.02	2.0637	1 36 53.1	15.949
4	11 43 39.92	2.0665	1 52 50.3	15.958
5	11 45 44.00	2.0695	2 8 48.0	15.965
6	11 47 48.26	2.0725	2 24 46.1	15.971
7	11 49 52.70	2.0755	2 40 44.5	15.975
8	11 51 57.32	2.0786	2 56 43.1	15.978
9	11 54 2.13	2.0818	3 12 41.8	15.979
10	11 56 7.14	2.0852	3 28 40.6	15.979
11	11 58 12.35	2.0886	3 44 39.3	15.977
12	12 0 17.77	2.0920	4 0 37.8	15.973
13	12 2 23.39	2.0955	4 16 36.1	15.968
14	12 4 29.23	2.0992	4 32 34.0	15.962
15	12 6 35.29	2.1028	4 48 31.5	15.954
16	12 8 41.57	2.1066	5 4 28.5	15.944
17	12 10 48.08	2.1104	5 20 24.8	15.933
18	12 12 54.82	2.1143	5 36 20.4	15.920
19	12 15 1.80	2.1183	5 52 15.2	15.906
20	12 17 9.02	2.1224	6 8 9.1	15.890
21	12 19 16.49	2.1266	6 24 2.0	15.873
22	12 21 24.21	2.1308	6 39 53.8	15.853
23	12 23 32.18	2.1350	S. 6 55 44.4	15.832

FRIDAY 8.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	12 25 40.41	2.1394	S. 7 11 33.6	15.808
1	12 27 48.91	2.1438	7 27 21.4	15.784
2	12 29 57.67	2.1483	7 43 7.7	15.758
3	12 32 6.70	2.1529	7 58 52.4	15.731
4	12 34 16.02	2.1576	8 14 35.4	15.702
5	12 36 25.61	2.1623	8 30 16.6	15.671
6	12 38 35.49	2.1671	8 45 55.9	15.638
7	12 40 45.66	2.1719	9 1 33.1	15.603
8	12 42 56.12	2.1768	9 17 8.2	15.566
9	12 45 6.88	2.1818	9 32 41.0	15.528
10	12 47 17.94	2.1869	9 48 11.5	15.488
11	12 49 29.31	2.1921	10 3 39.5	15.445
12	12 51 40.99	2.1973	10 19 4.9	15.402
13	12 53 52.98	2.2025	10 34 27.7	15.357
14	12 56 5.29	2.2078	10 49 47.7	15.309
15	12 58 17.92	2.2133	11 5 4.8	15.260
16	13 0 30.88	2.2188	11 20 18.9	15.209
17	13 2 44.17	2.2243	11 35 29.9	15.156
18	13 4 57.79	2.2298	11 50 37.6	15.101
19	13 7 11.75	2.2355	12 5 42.0	15.045
20	13 9 26.05	2.2412	12 20 43.0	14.987
21	13 11 40.69	2.2469	12 35 40.4	14.927
22	13 13 55.68	2.2527	12 50 34.2	14.864
23	13 16 11.02	2.2586	13 5 24.1	14.799
24	13 18 26.71	2.2645	S. 13 20 10.1	14.733

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 9.			
	h m s	s	° ′ ″	″
0	13 18 26.71	2.2645	S. 13 20 10.1	14.733
1	13 20 42.76	2.2705	13 34 52.1	14.666
2	13 22 59.17	2.2765	13 49 30.0	14.596
3	13 25 15.94	2.2825	14 4 3.6	14.524
4	13 27 33.07	2.2886	14 18 32.9	14.451
5	13 29 50.57	2.2948	14 32 57.7	14.375
6	13 32 8.45	2.3011	14 47 17.9	14.297
7	13 34 26.70	2.3073	15 1 33.3	14.217
8	13 36 45.33	2.3136	15 15 43.9	14.136
9	13 39 4.33	2.3199	15 29 49.6	14.053
10	13 41 23.72	2.3263	15 43 50.2	13.967
11	13 43 43.49	2.3327	15 57 45.6	13.879
12	13 46 3.64	2.3391	16 11 35.7	13.790
13	13 48 24.18	2.3456	16 25 20.4	13.698
14	13 50 45.11	2.3521	16 38 59.5	13.605
15	13 53 6.43	2.3586	16 52 33.0	13.510
16	13 55 28.14	2.3652	17 6 0.7	13.413
17	13 57 50.25	2.3718	17 19 22.5	13.313
18	14 0 12.75	2.3783	17 32 38.3	13.212
19	14 2 35.65	2.3849	17 45 47.9	13.108
20	14 4 58.94	2.3915	17 58 51.3	13.003
21	14 7 22.63	2.3982	18 11 48.3	12.896
22	14 9 46.72	2.4048	18 24 38.8	12.787
23	14 12 11.21	2.4115	S. 18 37 22.7	12.675
	SUNDAY 10.			
0	14 14 36.10	2.4181	S. 18 49 59.8	12.562
1	14 17 1.38	2.4248	19 2 30.1	12.448
2	14 19 27.07	2.4315	19 14 53.5	12.331
3	14 21 53.16	2.4381	19 27 9.8	12.212
4	14 24 19.64	2.4447	19 39 18.9	12.091
5	14 26 46.52	2.4513	19 51 20.7	11.968
6	14 29 13.80	2.4580	20 3 15.0	11.843
7	14 31 41.48	2.4646	20 15 1.8	11.717
8	14 34 9.55	2.4712	20 26 41.0	11.588
9	14 36 38.02	2.4778	20 38 12.4	11.458
10	14 39 6.88	2.4843	20 49 35.9	11.325
11	14 41 36.13	2.4908	21 0 51.4	11.191
12	14 44 5.77	2.4973	21 11 58.8	11.055
13	14 46 35.80	2.5037	21 22 58.0	10.917
14	14 49 6.21	2.5101	21 33 48.8	10.777
15	14 51 37.01	2.5165	21 44 31.2	10.636
16	14 54 8.19	2.5228	21 55 5.1	10.493
17	14 56 39.75	2.5291	22 5 30.3	10.348
18	14 59 11.68	2.5353	22 15 46.8	10.201
19	15 1 43.98	2.5414	22 25 54.4	10.052
20	15 4 16.65	2.5476	22 35 53.1	9.902
21	15 6 49.69	2.5536	22 45 42.7	9.750
22	15 9 23.08	2.5595	22 55 23.1	9.596
23	15 11 56.83	2.5654	23 4 54.2	9.441
24	15 14 30.93	2.5713	S. 23 14 16.0	9.284

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 11.			
	h m s	s	° ′ ″	″
0	15 14 30.93	2.5713	S. 23 14 16.0	9.23
1	15 17 5.38	2.5771	23 23 28.3	9.12
2	15 19 40.18	2.5828	23 32 31.0	8.96
3	15 22 15.31	2.5883	23 41 24.1	8.80
4	15 24 50.77	2.5938	23 50 7.4	8.64
5	15 27 26.56	2.5993	23 58 40.9	8.47
6	15 30 2.68	2.6046	24 7 4.4	8.30
7	15 32 39.11	2.6098	24 15 17.9	8.14
8	15 35 15.85	2.6149	24 23 21.3	7.97
9	15 37 52.90	2.6200	24 31 14.5	7.80
10	15 40 30.25	2.6248	24 38 57.4	7.63
11	15 43 7.88	2.6296	24 46 30.0	7.45
12	15 45 45.80	2.6343	24 53 52.1	7.28
13	15 48 24.00	2.6389	25 1 3.7	7.10
14	15 51 2.47	2.6433	25 8 4.7	6.92
15	15 53 41.20	2.6477	25 14 55.0	6.74
16	15 56 20.19	2.6519	25 21 34.6	6.57
17	15 58 59.43	2.6559	25 28 3.4	6.38
18	16 1 38.90	2.6598	25 34 21.3	6.20
19	16 4 18.60	2.6636	25 40 28.2	6.02
20	16 6 58.53	2.6673	25 46 24.2	5.84
21	16 9 38.68	2.6708	25 52 9.1	5.65
22	16 12 19.03	2.6742	25 57 42.9	5.47
23	16 14 59.58	2.6773	S. 26 3 5.5	5.28
	TUESDAY 12.			
0	16 17 40.31	2.6803	S. 26 8 16.9	5.09
1	16 20 21.22	2.6833	26 13 17.0	4.90
2	16 23 2.31	2.6861	26 18 5.8	4.71
3	16 25 43.55	2.6887	26 22 43.2	4.52
4	16 28 24.95	2.6912	26 27 9.2	4.33
5	16 31 6.49	2.6934	26 31 23.7	4.14
6	16 33 48.16	2.6955	26 35 26.8	3.95
7	16 36 29.95	2.6974	26 39 18.3	3.76
8	16 39 11.85	2.6992	26 42 58.2	3.56
9	16 41 53.85	2.7008	26 46 26.6	3.37
10	16 44 35.94	2.7023	26 49 43.4	3.18
11	16 47 18.12	2.7036	26 52 48.5	2.98
12	16 50 0.37	2.7047	26 55 41.9	2.79
13	16 52 42.68	2.7056	26 58 23.6	2.59
14	16 55 25.04	2.7063	27 0 53.6	2.40
15	16 58 7.44	2.7068	27 3 11.9	2.20
16	17 0 49.86	2.7072	27 5 18.5	2.01
17	17 3 32.30	2.7075	27 7 13.4	1.81
18	17 6 14.76	2.7076	27 8 56.5	1.62
19	17 8 57.21	2.7074	27 10 27.8	1.42
20	17 11 39.65	2.7072	27 11 47.4	1.22
21	17 14 22.07	2.7067	27 12 55.2	1.03
22	17 17 4.45	2.7059	27 13 51.3	0.83
23	17 19 46.78	2.7051	27 14 35.7	0.64
24	17 22 29.06	2.7041	S. 27 15 8.3	0.44

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 13.					FRIDAY 15.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	17 22 29.06	2.7041	S. 27 15 8.3	0.446	0	19 28 8.65	2.4841	S. 24 4 27.3	7.974
1	17 25 11.27	2.7028	27 15 29.2	0.251	1	19 30 37.49	2.4771	23 56 24.5	8.118
2	17 27 53.40	2.7015	27 15 38.4	−0.056	2	19 33 5.90	2.4701	23 48 13.1	8.261
3	17 30 35.45	2.7000	27 15 35.9	+0.138	3	19 35 33.90	2.4631	23 39 53.2	8.402
4	17 33 17.40	2.6983	27 15 21.8	0.332	4	19 38 1.47	2.4560	23 31 24.9	8.541
5	17 35 59.24	2.6963	27 14 56.1	0.526	5	19 40 28.62	2.4489	23 22 48.3	8.678
6	17 38 40.96	2.6943	27 14 18.7	0.720	6	19 42 55.34	2.4417	23 14 3.6	8.813
7	17 41 22.56	2.6921	27 13 29.7	0.913	7	19 45 21.62	2.4345	23 5 10.7	8.948
8	17 44 4.01	2.6897	27 12 29.2	1.104	8	19 47 47.48	2.4273	22 56 9.8	9.080
9	17 46 45.32	2.6872	27 11 17.2	1.296	9	19 50 12.90	2.4201	22 47 1.1	9.211
10	17 49 26.47	2.6844	27 9 53.7	1.488	10	19 52 37.89	2.4129	22 37 44.5	9.341
11	17 52 7.45	2.6815	27 8 18.7	1.678	11	19 55 2.45	2.4057	22 28 20.2	9.468
12	17 54 48.25	2.6784	27 6 32.3	1.868	12	19 57 26.57	2.3983	22 18 48.3	9.594
13	17 57 28.86	2.6752	27 4 34.6	2.057	13	19 59 50.25	2.3911	22 9 8.9	9.718
14	18 0 9.27	2.6718	27 2 25.5	2.246	14	20 2 13.50	2.3839	21 59 22.1	9.841
15	18 2 49.48	2.6683	27 0 5.1	2.433	15	20 4 36.32	2.3767	21 49 28.0	9.962
16	18 5 29.47	2.6646	26 57 33.5	2.619	16	20 6 58.70	2.3693	21 39 26.7	10.081
17	18 8 9.23	2.6608	26 54 50.8	2.805	17	20 9 20.64	2.3621	21 29 18.3	10.199
18	18 10 48.76	2.6568	26 51 56.9	2.990	18	20 11 42.15	2.3549	21 19 2.8	10.316
19	18 13 28.04	2.6526	26 48 52.0	3.174	19	20 14 3.23	2.3477	21 8 40.4	10.430
20	18 16 7.07	2.6484	26 45 36.0	3.357	20	20 16 23.87	2.3404	20 58 11.2	10.543
21	18 18 45.85	2.6441	26 42 9.1	3.539	21	20 18 44.08	2.3332	20 47 35.3	10.654
22	18 21 24.36	2.6395	26 38 31.3	3.720	22	20 21 3.85	2.3260	20 36 52.7	10.763
23	18 24 2.59	2.6348	S. 26 34 42.7	3.900	23	20 23 23.20	2.3188	S. 20 26 3.7	10.871
	THURSDAY 14.					SATURDAY 16.			
0	18 26 40.53	2.6299	S. 26 30 43.3	4.079	0	20 25 42.11	2.3116	S. 20 15 8.2	10.978
1	18 29 18.18	2.6250	26 26 33.2	4.257	1	20 28 0.59	2.3045	20 4 6.4	11.082
2	18 31 55.53	2.6199	26 22 12.5	4.433	2	20 30 18.65	2.2975	19 52 58.4	11.185
3	18 34 32.57	2.6148	26 17 41.3	4.608	3	20 32 36.29	2.2904	19 41 44.2	11.287
4	18 37 9.30	2.6095	26 12 59.6	4.783	4	20 34 53.50	2.2833	19 30 24.0	11.386
5	18 39 45.71	2.6041	26 8 7.4	4.956	5	20 37 10.29	2.2763	19 18 57.9	11.484
6	18 42 21.79	2.5986	26 3 4.9	5.127	6	20 39 26.66	2.2693	19 7 25.9	11.581
7	18 44 57.54	2.5929	25 57 52.2	5.297	7	20 41 42.61	2.2623	18 55 48.2	11.676
8	18 47 32.94	2.5872	25 52 29.3	5.466	8	20 43 58.14	2.2554	18 44 4.8	11.769
9	18 50 8.00	2.5814	25 46 56.3	5.633	9	20 46 13.26	2.2486	18 32 15.9	11.861
10	18 52 42.71	2.5755	25 41 13.3	5.800	10	20 48 27.97	2.2418	18 20 21.5	11.952
11	18 55 17.06	2.5694	25 35 20.3	5.965	11	20 50 42.28	2.2351	18 8 21.7	12.040
12	18 57 51.04	2.5633	25 29 17.5	6.128	12	20 52 56.18	2.2283	17 56 16.7	12.127
13	19 0 24.65	2.5571	25 23 4.9	6.290	13	20 55 9.68	2.2216	17 44 6.5	12.213
14	19 2 57.89	2.5508	25 16 42.7	6.451	14	20 57 22.77	2.2149	17 31 51.2	12.297
15	19 5 30.74	2.5443	25 10 10.8	6.610	15	20 59 35.47	2.2084	17 19 30.9	12.378
16	19 8 3.21	2.5379	25 3 29.5	6.768	16	21 1 47.78	2.2018	17 7 5.8	12.459
17	19 10 35.29	2.5314	24 56 38.7	6.924	17	21 3 59.69	2.1953	16 54 35.8	12.539
18	19 13 6.98	2.5248	24 49 38.6	7.078	18	21 6 11.22	2.1890	16 42 1.1	12.617
19	19 15 38.27	2.5182	24 42 29.3	7.232	19	21 8 22.37	2.1826	16 29 21.8	12.693
20	19 18 9.16	2.5115	24 35 10.8	7.383	20	21 10 33.13	2.1763	16 16 38.0	12.768
21	19 20 39.65	2.5048	24 27 43.3	7.533	21	21 12 43.52	2.1701	16 3 49.7	12.841
22	19 23 9.73	2.4979	24 20 6.8	7.682	22	21 14 53.54	2.1638	15 50 57.1	12.913
23	19 25 39.40	2.4910	24 12 21.4	7.829	23	21 17 3.18	2.1577	15 38 0.2	12.983
24	19 28 8.65	2.4841	S. 24 4 27.3	7.974	24	21 19 12.46	2.1517	S. 15 24 59.1	13.052

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 17.					**TUESDAY 19.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 19 12.46	2.1517	S. 15 24 59.1	13.052	0	22 56 49.52	1.9446	S. 4 5 2.8	14.79
1	21 21 21.38	2.1457	15 11 54.0	13.119	1	22 58 46.12	1.9422	3 50 15.0	14.80
2	21 23 29.94	2.1397	14 58 44.8	13.186	2	23 0 42.58	1.9398	3 35 26.8	14.80
3	21 25 38.14	2.1338	14 45 31.7	13.250	3	23 2 38.90	1.9375	3 20 38.3	14.81
4	21 27 45.99	2.1280	14 32 14.8	13.313	4	23 4 35.08	1.9353	3 5 49.5	14.81
5	21 29 53.50	2.1223	14 18 54.2	13.374	5	23 6 31.13	1.9331	2 51 0.6	14.81
6	21 32 0.66	2.1165	14 5 29.9	13.435	6	23 8 27.05	1.9310	2 36 11.6	14.81
7	21 34 7.48	2.1109	13 52 2.0	13.493	7	23 10 22.85	1.9291	2 21 22.5	14.81
8	21 36 13.97	2.1054	13 38 30.7	13.551	8	23 12 18.54	1.9272	2 6 33.3	14.81
9	21 38 20.13	2.0999	13 24 55.9	13.608	9	23 14 14.11	1.9253	1 51 44.3	14.81
10	21 40 25.96	2.0945	13 11 17.8	13.662	10	23 16 9.58	1.9236	1 36 55.4	14.81
11	21 42 31.47	2.0892	12 57 36.5	13.715	11	23 18 4.94	1.9218	1 22 6.7	14.81
12	21 44 36.66	2.0839	12 43 52.0	13.767	12	23 20 0.20	1.9202	1 7 18.2	14.80
13	21 46 41.54	2.0788	12 30 4.4	13.817	13	23 21 55.36	1.9187	0 52 30.1	14.79
14	21 48 46.11	2.0736	12 16 13.9	13.866	14	23 23 50.44	1.9172	0 37 42.4	14.79
15	21 50 50.37	2.0685	12 2 20.5	13.914	15	23 25 45.43	1.9158	0 22 55.1	14.78
16	21 52 54.33	2.0636	11 48 24.2	13.962	16	23 27 40.34	1.9145	S. 0 8 8.3	14.77
17	21 54 58.00	2.0587	11 34 25.1	14.007	17	23 29 35.17	1.9133	N. 0 6 37.9	14.76
18	21 57 1.37	2.0538	11 20 23.4	14.050	18	23 31 29.93	1.9121	0 21 23.5	14.75
19	21 59 4.46	2.0491	11 6 19.1	14.092	19	23 33 24.62	1.9109	0 36 8.4	14.74
20	22 1 7.26	2.0444	10 52 12.3	14.134	20	23 35 19.24	1.9098	0 50 52.5	14.72
21	22 3 9.79	2.0398	10 38 3.0	14.175	21	23 37 13.80	1.9089	1 5 35.8	14.71
22	22 5 12.04	2.0353	10 23 51.3	14.213	22	23 39 8.31	1.9081	1 20 18.3	14.70
23	22 7 14.02	2.0308	S. 10 9 37.4	14.250	23	23 41 2.77	1.9073	N. 1 34 59.8	14.68
	MONDAY 18.					**WEDNESDAY 20.**			
0	22 9 15.74	2.0265	S. 9 55 21.3	14.286	0	23 42 57.18	1.9065	N. 1 49 40.4	14.667
1	22 11 17.20	2.0222	9 41 3.1	14.321	1	23 44 51.55	1.9058	2 4 19.9	14.649
2	22 13 18.40	2.0179	9 26 42.8	14.355	2	23 46 45.88	1.9052	2 18 58.3	14.630
3	22 15 19.35	2.0138	9 12 20.5	14.387	3	23 48 40.17	1.9046	2 33 35.5	14.609
4	22 17 20.05	2.0097	8 57 56.3	14.418	4	23 50 34.43	1.9042	2 48 11.4	14.588
5	22 19 20.51	2.0057	8 43 30.3	14.448	5	23 52 28.67	1.9038	3 2 46.1	14.567
6	22 21 20.74	2.0018	8 29 2.5	14.477	6	23 54 22.88	1.9034	3 17 19.4	14.543
7	22 23 20.73	1.9979	8 14 33.1	14.504	7	23 56 17.08	1.9032	3 31 51.3	14.520
8	22 25 20.49	1.9942	8 0 2.0	14.531	8	23 58 11.26	1.9029	3 46 21.8	14.495
9	22 27 20.03	1.9905	7 45 29.4	14.556	9	0 0 5.43	1.9028	4 0 50.7	14.469
10	22 29 19.35	1.9869	7 30 55.3	14.580	10	0 1 59.59	1.9027	4 15 18.1	14.442
11	22 31 18.46	1.9834	7 16 19.8	14.603	11	0 3 53.75	1.9027	4 29 43.8	14.414
12	22 33 17.36	1.9800	7 1 43.0	14.624	12	0 5 47.92	1.9028	4 44 7.8	14.386
13	22 35 16.06	1.9766	6 47 4.9	14.644	13	0 7 42.09	1.9029	4 58 30.1	14.357
14	22 37 14.55	1.9733	6 32 25.7	14.663	14	0 9 36.27	1.9031	5 12 50.6	14.326
15	22 39 12.85	1.9701	6 17 45.3	14.682	15	0 11 30.46	1.9033	5 27 9.2	14.293
16	22 41 10.96	1.9669	6 3 3.8	14.699	16	0 13 24.67	1.9037	5 41 25.8	14.261
17	22 43 8.88	1.9638	5 48 21.4	14.714	17	0 15 18.90	1.9040	5 55 40.5	14.228
18	22 45 6.62	1.9609	5 33 38.1	14.729	18	0 17 13.15	1.9044	6 9 53.1	14.193
19	22 47 4.19	1.9580	5 18 53.9	14.742	19	0 19 7.43	1.9050	6 24 3.7	14.158
20	22 49 1.58	1.9551	5 4 9.0	14.754	20	0 21 1.75	1.9056	6 38 12.1	14.122
21	22 50 58.80	1.9523	4 49 23.4	14.766	21	0 22 56.10	1.9062	6 52 18.3	14.084
22	22 52 55.86	1.9497	4 34 37.1	14.777	22	0 24 50.49	1.9069	7 6 22.2	14.046
23	22 54 52.77	1.9472	4 19 50.2	14.786	23	0 26 44.93	1.9077	7 20 23.8	14.007
24	22 56 49.52	1.9446	S. 4 5 2.8	14.793	24	0 28 39.41	1.9084	N. 7 34 23.0	13.967

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

our.	Right Ascension.			Diff. for 1 Min.	Declination.			Diff. for 1 Min.
THURSDAY 21.								
	h	m	s	s	°	′	″	″
0	0	28	39.41	1.9084	N. 7	34	23.0	13.967
1	0	30	33.94	1.9093	7	48	19.8	13.926
2	0	32	28.53	1.9103	8	2	14.1	13.883
3	0	34	23.18	1.9113	8	16	5.8	13.841
4	0	36	17.88	1.9123	8	29	55.0	13.798
5	0	38	12.65	1.9134	8	43	41.5	13.753
6	0	40	7.49	1.9146	8	57	25.3	13.707
7	0	42	2.40	1.9158	9	11	6.3	13.660
8	0	43	57.38	1.9170	9	24	44.5	13.613
9	0	45	52.44	1.9183	9	38	19.8	13.564
10	0	47	47.58	1.9197	9	51	52.2	13.515
11	0	49	42.81	1.9212	10	5	21.6	13.465
12	0	51	38.13	1.9227	10	18	48.0	13.414
13	0	53	33.54	1.9242	10	32	11.3	13.362
14	0	55	29.04	1.9257	10	45	31.4	13.308
15	0	57	24.63	1.9273	10	58	48.3	13.255
16	0	59	20.32	1.9291	11	12	2.0	13.200
17	1	1	16.12	1.9308	11	25	12.3	13.144
18	1	3	12.02	1.9327	11	38	19.3	13.088
19	1	5	8.04	1.9345	11	51	22.9	13.031
20	1	7	4.16	1.9363	12	4	23.0	12.972
21	1	9	0.40	1.9383	12	17	19.5	12.913
22	1	10	56.76	1.9403	12	30	12.5	12.853
23	1	12	53.24	1.9423	N. 12	43	1.8	12.791
FRIDAY 22.								
0	1	14	49.84	1.9444	N. 12	55	47.4	12.729
1	1	16	46.57	1.9465	13	8	29.3	12.667
2	1	18	43.42	1.9486	13	21	7.4	12.603
3	1	20	40.40	1.9508	13	33	41.6	12.538
4	1	22	37.52	1.9532	13	46	11.9	12.473
5	1	24	34.78	1.9554	13	58	38.3	12.406
6	1	26	32.17	1.9577	14	11	0.6	12.338
7	1	28	29.70	1.9600	14	23	18.9	12.270
8	1	30	27.37	1.9624	14	35	33.0	12.201
9	1	32	25.19	1.9649	14	47	43.0	12.132
10	1	34	23.16	1.9674	14	59	48.8	12.061
11	1	36	21.28	1.9698	15	11	50.3	11.989
12	1	38	19.54	1.9723	15	23	47.5	11.917
13	1	40	17.96	1.9750	15	35	40.3	11.843
14	1	42	16.54	1.9776	15	47	28.7	11.769
15	1	44	15.27	1.9802	15	59	12.6	11.694
16	1	46	14.16	1.9828	16	10	52.0	11.618
17	1	48	13.21	1.9855	16	22	26.8	11.541
18	1	50	12.42	1.9883	16	33	56.9	11.463
19	1	52	11.80	1.9911	16	45	22.4	11.385
20	1	54	11.35	1.9939	16	56	43.1	11.306
21	1	56	11.07	1.9967	17	7	59.1	11.226
22	1	58	10.95	1.9994	17	19	10.2	11.144
23	2	0	11.00	2.0023	17	30	16.4	11.062
24	2	2	11.23	2.0053	N. 17	41	17.7	10.980

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.			Diff. for 1 Min.
SATURDAY 23.								
	h	m	s	s	°	′	″	″
0	2	2	11.23	2.0053	N. 17	41	17.7	10.980
1	2	4	11.63	2.0082	17	52	14.0	10.896
2	2	6	12.21	2.0111	18	3	5.2	10.812
3	2	8	12.96	2.0140	18	13	51.4	10.727
4	2	10	13.89	2.0170	18	24	32.4	10.641
5	2	12	15.00	2.0199	18	35	8.3	10.554
6	2	14	16.28	2.0229	18	45	38.9	10.466
7	2	16	17.75	2.0260	18	56	4.2	10.377
8	2	18	19.40	2.0290	19	6	24.2	10.288
9	2	20	21.23	2.0321	19	16	38.8	10.198
10	2	22	23.25	2.0352	19	26	47.9	10.107
11	2	24	25.45	2.0382	19	36	51.6	10.015
12	2	26	27.83	2.0413	19	46	49.7	9.922
13	2	28	30.40	2.0443	19	56	42.3	9.829
14	2	30	33.15	2.0474	20	6	29.2	9.735
15	2	32	36.09	2.0505	20	16	10.5	9.640
16	2	34	39.21	2.0536	20	25	46.0	9.544
17	2	36	42.52	2.0568	20	35	15.8	9.447
18	2	38	46.02	2.0598	20	44	39.7	9.350
19	2	40	49.70	2.0629	20	53	57.8	9.252
20	2	42	53.57	2.0661	21	3	10.0	9.154
21	2	44	57.63	2.0692	21	12	16.3	9.055
22	2	47	1.87	2.0723	21	21	16.6	8.954
23	2	49	6.30	2.0754	N. 21	30	10.8	8.853
SUNDAY 24.								
0	2	51	10.92	2.0785	N. 21	38	59.0	8.752
1	2	53	15.72	2.0816	21	47	41.0	8.649
2	2	55	20.71	2.0847	21	56	16.9	8.547
3	2	57	25.88	2.0878	22	4	46.6	8.443
4	2	59	31.24	2.0908	22	13	10.0	8.338
5	3	1	36.78	2.0939	22	21	27.2	8.233
6	3	3	42.51	2.0969	22	29	38.0	8.127
7	3	5	48.41	2.0999	22	37	42.4	8.020
8	3	7	54.50	2.1030	22	45	40.4	7.912
9	3	10	0.77	2.1060	22	53	31.9	7.804
10	3	12	7.22	2.1090	23	1	16.9	7.696
11	3	14	13.85	2.1119	23	8	55.4	7.587
12	3	16	20.65	2.1148	23	16	27.3	7.477
13	3	18	27.63	2.1178	23	23	52.6	7.366
14	3	20	34.78	2.1207	23	31	11.2	7.254
15	3	22	42.11	2.1236	23	38	23.1	7.142
16	3	24	49.61	2.1264	23	45	28.3	7.030
17	3	26	57.28	2.1292	23	52	26.7	6.917
18	3	29	5.12	2.1320	23	59	18.3	6.803
19	3	31	13.12	2.1348	24	6	3.1	6.689
20	3	33	21.29	2.1375	24	12	41.0	6.574
21	3	35	29.62	2.1402	24	19	12.0	6.458
22	3	37	38.11	2.1428	24	25	36.0	6.342
23	3	39	46.76	2.1455	24	31	53.1	6.226
24	3	41	55.57	2.1482	N. 24	38	3.1	6.108

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 25.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	3 41 55.57	2.1482	N. 24 38 3.1	6.108
1	3 44 4.54	2.1507	24 44 6.1	5.991
2	3 46 13.65	2.1532	24 50 2.0	5.873
3	3 48 22.92	2.1557	24 55 50.8	5.754
4	3 50 32.33	2.1581	25 1 32.5	5.635
5	3 52 41.89	2.1606	25 7 7.0	5.515
6	3 54 51.60	2.1629	25 12 34.3	5.395
7	3 57 1.44	2.1652	25 17 54.4	5.274
8	3 59 11.42	2.1675	25 23 7.2	5.153
9	4 1 21.54	2.1697	25 28 12.7	5.031
10	4 3 31.79	2.1719	25 33 10.9	4.908
11	4 5 42.17	2.1740	25 38 1.7	4.786
12	4 7 52.67	2.1761	25 42 45.2	4.663
13	4 10 3.30	2.1782	25 47 21.3	4.540
14	4 12 14.05	2.1802	25 51 50.0	4.416
15	4 14 24.92	2.1821	25 56 11.2	4.291
16	4 16 35.90	2.1840	26 0 24.9	4.167
17	4 18 47.00	2.1858	26 4 31.2	4.042
18	4 20 58.20	2.1875	26 8 30.0	3.917
19	4 23 9.50	2.1892	26 12 21.2	3.791
20	4 25 20.91	2.1909	26 16 4.9	3.665
21	4 27 32.41	2.1925	26 19 41.0	3.538
22	4 29 44.01	2.1941	26 23 9.5	3.412
23	4 31 55.70	2.1956	N. 26 26 30.4	3.285

TUESDAY 26.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	4 34 7.48	2.1970	N. 26 29 43.7	3.158
1	4 36 19.34	2.1983	26 32 49.3	3.030
2	4 38 31.28	2.1997	26 35 47.3	2.903
3	4 40 43.30	2.2010	26 38 37.7	2.775
4	4 42 55.40	2.2022	26 41 20.3	2.646
5	4 45 7.56	2.2033	26 43 55.2	2.518
6	4 47 19.79	2.2043	26 46 22.4	2.389
7	4 49 32.08	2.2053	26 48 41.9	2.260
8	4 51 44.43	2.2062	26 50 53.6	2.131
9	4 53 56.83	2.2071	26 52 57.6	2.002
10	4 56 9.28	2.2079	26 54 53.8	1.873
11	4 58 21.78	2.2087	26 56 42.3	1.743
12	5 0 34.32	2.2093	26 58 23.0	1.613
13	5 2 46.90	2.2099	26 59 55.9	1.483
14	5 4 59.51	2.2105	27 1 21.0	1.353
15	5 7 12.16	2.2110	27 2 38.3	1.223
16	5 9 24.83	2.2114	27 3 47.8	1.093
17	5 11 37.53	2.2118	27 4 49.5	0.963
18	5 13 50.25	2.2121	27 5 43.3	0.833
19	5 16 2.98	2.2123	27 6 29.4	0.703
20	5 18 15.72	2.2124	27 7 7.7	0.573
21	5 20 28.47	2.2125	27 7 38.1	0.442
22	5 22 41.22	2.2125	27 8 0.7	0.312
23	5 24 53.97	2.2125	27 8 15.5	0.181
24	5 27 6.72	2.2124	N. 27 8 22.4	0.050

WEDNESDAY 27.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	5 27 6.72	2.2124	N. 27 8 22.4	+0.050
1	5 29 19.46	2.2122	27 8 21.5	−0.080
2	5 31 32.19	2.2120	27 8 12.8	0.210
3	5 33 44.90	2.2117	27 7 56.3	0.340
4	5 35 57.59	2.2113	27 7 32.0	0.470
5	5 38 10.25	2.2108	27 6 59.9	0.601
6	5 40 22.89	2.2103	27 6 19.9	0.731
7	5 42 35.49	2.2098	27 5 32.2	0.860
8	5 44 48.06	2.2092	27 4 36.7	0.990
9	5 47 0.59	2.2085	27 3 33.4	1.120
10	5 49 13.08	2.2077	27 2 22.3	1.250
11	5 51 25.52	2.2069	27 1 3.4	1.379
12	5 53 37.91	2.2060	26 59 36.8	1.508
13	5 55 50.24	2.2051	26 58 2.4	1.637
14	5 58 2.52	2.2041	26 56 20.3	1.766
15	6 0 14.73	2.2029	26 54 30.5	1.894
16	6 2 26.87	2.2018	26 52 32.9	2.023
17	6 4 38.95	2.2007	26 50 27.7	2.151
18	6 6 50.95	2.1994	26 48 14.8	2.279
19	6 9 2.88	2.1982	26 45 54.2	2.407
20	6 11 14.73	2.1968	26 43 25.9	2.535
21	6 13 26.49	2.1953	26 40 50.0	2.662
22	6 15 38.17	2.1939	26 38 6.5	2.788
23	6 17 49.76	2.1924	N. 26 35 15.4	2.916

THURSDAY 28.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	6 20 1.26	2.1909	N. 26 32 16.6	3.042
1	6 22 12.67	2.1893	26 29 10.3	3.168
2	6 24 23.97	2.1876	26 25 56.4	3.294
3	6 26 35.18	2.1859	26 22 35.0	3.419
4	6 28 46.28	2.1841	26 19 6.1	3.545
5	6 30 57.27	2.1823	26 15 29.6	3.670
6	6 33 8.15	2.1804	26 11 45.7	3.794
7	6 35 18.92	2.1785	26 7 54.3	3.918
8	6 37 29.57	2.1766	26 3 55.5	4.042
9	6 39 40.11	2.1746	25 59 49.3	4.166
10	6 41 50.52	2.1725	25 55 35.6	4.289
11	6 44 0.81	2.1705	25 51 14.6	4.411
12	6 46 10.98	2.1684	25 46 46.3	4.533
13	6 48 21.02	2.1663	25 42 10.6	4.655
14	6 50 30.93	2.1641	25 37 27.7	4.776
15	6 52 40.71	2.1618	25 32 37.5	4.897
16	6 54 50.35	2.1595	25 27 40.0	5.018
17	6 56 59.85	2.1573	25 22 35.3	5.138
18	6 59 9.22	2.1550	25 17 23.4	5.258
19	7 1 18.45	2.1526	25 12 4.4	5.377
20	7 3 27.53	2.1502	25 6 38.2	5.496
21	7 5 36.47	2.1478	25 1 4.9	5.614
22	7 7 45.27	2.1454	24 55 24.5	5.732
23	7 9 53.92	2.1429	24 49 37.1	5.849
24	7 12 2.42	2.1404	N. 24 43 42.6	5.967

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.				Diff. for 1 Min.
FRIDAY 29.									
	h	m	s	s		°	′	″	″
0	7	12	2.42	2.1404	N.	24	43	42.6	5.967
1	7	14	10.77	2.1379		24	37	41.1	6.083
2	7	16	18.97	2.1353		24	31	32.7	6.198
3	7	18	27.01	2.1328		24	25	17.3	6.314
4	7	20	34.90	2.1303		24	18	55.0	6.428
5	7	22	42.64	2.1277		24	12	25.9	6.543
6	7	24	50.22	2.1250		24	5	49.9	6.657
7	7	26	57.64	2.1223		23	59	7.1	6.770
8	7	29	4.90	2.1197		23	52	17.5	6.883
9	7	31	12.00	2.1171		23	45	21.1	6.996
10	7	33	18.95	2.1144		23	38	18.0	7.107
11	7	35	25.73	2.1117		23	31	8.2	7.218
12	7	37	32.35	2.1090		23	23	51.8	7.328
13	7	39	38.81	2.1063		23	16	28.8	7.439
14	7	41	45.11	2.1036		23	8	59.1	7.549
15	7	43	51.24	2.1008		23	1	22.9	7.658
16	7	45	57.21	2.0982		22	53	40.2	7.767
17	7	48	3.02	2.0955		22	45	50.9	7.875
18	7	50	8.67	2.0928		22	37	55.2	7.982
19	7	52	14.15	2.0900		22	29	53.1	8.088
20	7	54	19.47	2.0873		22	21	44.6	8.194
21	7	56	24.63	2.0847		22	13	29.8	8.300
22	7	58	29.63	2.0820		22	5	8.6	8.405
23	8	0	34.47	2.0793	N.	21	56	41.2	8.509
SATURDAY 30.									
0	8	2	39.15	2.0767	N.	21	48	7.5	8.613
1	8	4	43.67	2.0739		21	39	27.6	8.716
2	8	6	48.02	2.0712		21	30	41.6	8.818
3	8	8	52.21	2.0685		21	21	49.4	8.921
4	8	10	56.24	2.0659		21	12	51.1	9.023
5	8	13	0.12	2.0633		21	3	46.7	9.123
6	8	15	3.84	2.0607		20	54	36.3	9.223
7	8	17	7.40	2.0580		20	45	19.9	9.323
8	8	19	10.80	2.0554		20	35	57.6	9.422
9	8	21	14.05	2.0529		20	26	29.3	9.521
10	8	23	17.15	2.0503		20	16	55.1	9.618
11	8	25	20.09	2.0478		20	7	15.1	9.715
12	8	27	22.88	2.0453		19	57	29.3	9.812
13	8	29	25.52	2.0428		19	47	37.7	9.908
14	8	31	28.01	2.0403		19	37	40.4	10.003
15	8	33	30.35	2.0378		19	27	37.4	10.097
16	8	35	32.55	2.0355		19	17	28.8	10.191
17	8	37	34.61	2.0331		19	7	14.5	10.285
18	8	39	36.52	2.0307		18	56	54.6	10.378
19	8	41	38.29	2.0283		18	46	29.2	10.470
20	8	43	39.92	2.0261		18	35	58.2	10.562
21	8	45	41.42	2.0238		18	25	21.8	10.652
22	8	47	42.78	2.0216		18	14	40.0	10.742
23	8	49	44.01	2.0193		18	3	52.8	10.832
24	8	51	45.10	2.0172	N.	17	53	0.2	10.921

Hour.	Right Ascension.			Diff. for 1 Min.	Declination.				Diff. for 1 Min.
SUNDAY 31.									
	h	m	s	s		°	′	″	″
0	8	51	45.10	2.0172	N.	17	53	0.2	10.921
1	8	53	46.07	2.0151		17	42	2.3	11.008
2	8	55	46.91	2.0129		17	30	59.2	11.096
3	8	57	47.62	2.0108		17	19	50.8	11.183
4	8	59	48.21	2.0088		17	8	37.2	11.269
5	9	1	48.68	2.0069		16	57	18.5	11.354
6	9	3	49.04	2.0050		16	45	54.7	11.439
7	9	5	49.28	2.0030		16	34	25.8	11.523
8	9	7	49.40	2.0011		16	22	51.9	11.607
9	9	9	49.41	1.9993		16	11	13.0	11.690
10	9	11	49.32	1.9976		15	59	29.1	11.772
11	9	13	49.12	1.9958		15	47	40.3	11.854
12	9	15	48.82	1.9942		15	35	46.6	11.935
13	9	17	48.42	1.9925		15	23	48.1	12.015
14	9	19	47.92	1.9909		15	11	44.8	12.094
15	9	21	47.33	1.9893		14	59	36.8	12.173
16	9	23	46.64	1.9878		14	47	24.1	12.251
17	9	25	45.87	1.9864		14	35	6.7	12.328
18	9	27	45.01	1.9850		14	22	44.7	12.405
19	9	29	44.07	1.9837		14	10	18.1	12.482
20	9	31	43.05	1.9824		13	57	46.9	12.557
21	9	33	41.96	1.9812		13	45	11.3	12.631
22	9	35	40.79	1.9799		13	32	31.2	12.705
23	9	37	39.55	1.9788	N.	13	19	46.7	12.778
MONDAY, NOVEMBER 1.									
0	9	39	38.25	1.9778	N.	13	6	57.8	12.851

PHASES OF THE MOON.

			d	h	m
●	New Moon	Oct.	8	9	42.1
☽	First Quarter		15	1	51.5
○	Full Moon		22	12	15.5
☾	Last Quarter		30	16	39.8

			d	h
☾	Perigee	Oct.	11	0.1
☾	Apogee		26	23.1

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S					Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Subtracted from Apparent Time.	Diff. for 1 Hour.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.	Semidiameter.			
		h m s	s	° ′ ″	″	′ ″	s	m s	s
Mon.	1	14 22 24.37	9.768	S.14 10 24.3	−48.58	16 8.92	66.80	16 19.11	0.088
Tues.	2	14 26 19.20	9.802	14 29 43.5	48.01	16 9.17	66.92	16 20.84	0.054
Wed.	3	14 30 14.84	9.836	14 48 48.8	47.42	16 9.41	67.03	16 21.74	0.020
Thur.	4	14 34 11.32	9.870	15 7 39.7	−46.81	16 9.65	67.15	16 21.83	0.015
Fri.	5	14 38 8.62	9.905	15 26 15.7	46.18	16 9.89	67.26	16 21.08	0.049
Sat.	6	14 42 6.77	9.940	15 44 36.6	45.54	16 10.13	67.38	16 19.49	0.084
SUN.	7	14 46 5.75	9.975	16 2 41.8	−44.88	16 10.37	67.50	16 17.07	0.119
Mon.	8	14 50 5.57	10.010	16 20 30.9	44.20	16 10.61	67.62	16 13.81	0.154
Tues.	9	14 54 6.24	10.045	16 38 3.4	43.50	16 10.84	67.74	16 9.72	0.188
Wed.	10	14 58 7.73	10.080	16 55 19.0	−42.79	16 11.08	67.86	16 4.79	0.223
Thur.	11	15 2 10.06	10.114	17 12 17.2	42.06	16 11.31	67.98	15 59.04	0.258
Fri.	12	15 6 13.22	10.149	17 28 57.7	41.31	16 11.54	68.10	15 52.44	0.292
Sat.	13	15 10 17.22	10.184	17 45 20.0	−40.54	16 11.77	68.22	15 45.03	0.327
SUN.	14	15 14 22.05	10.218	18 1 23.7	39.76	16 12.00	68.34	15 36.78	0.361
Mon.	15	15 18 27.71	10.253	18 17 8.5	38.96	16 12.22	68.46	15 27.70	0.396
Tues.	16	15 22 34.20	10.288	18 32 34.0	−38.15	16 12.44	68.58	15 17.80	0.430
Wed.	17	15 26 41.51	10.322	18 47 39.8	37.32	16 12.66	68.70	15 7.07	0.465
Thur.	18	15 30 49.66	10.356	19 2 25.5	36.47	16 12.87	68.82	14 55.51	0.499
Fri.	19	15 34 58.62	10.391	19 16 50.9	−35.61	16 13.08	68.94	14 43.14	0.533
Sat.	20	15 39 8.41	10.425	19 30 55.4	34.74	16 13.28	69.05	14 29.94	0.567
SUN.	21	15 43 19.02	10.459	19 44 38.8	33.86	16 13.48	69.16	14 15.93	0.601
Mon.	22	15 47 30.43	10.493	19 58 0.7	−32.96	16 13.67	69.27	14 1.11	0.634
Tues.	23	15 51 42.66	10.526	20 11 0.8	32.04	16 13.86	69.38	13 45.49	0.668
Wed.	24	15 55 55.68	10.559	20 23 38.7	31.11	16 14.04	69.48	13 29.07	0.701
Thur.	25	16 0 9.49	10.592	20 35 54.0	−30.16	16 14.22	69.59	13 11.87	0.733
Fri.	26	16 4 24.08	10.624	20 47 46.4	29.20	16 14.40	69.69	12 53.88	0.765
Sat.	27	16 8 39.43	10.656	20 59 15.6	28.23	16 14.57	69.80	12 35.14	0.797
SUN.	28	16 12 55.54	10.687	21 10 21.2	−27.24	16 14.74	69.90	12 15.64	0.828
Mon.	29	16 17 12.39	10.717	21 21 3.0	26.23	16 14.90	70.00	11 55.40	0.858
Tues.	30	16 21 29.96	10.747	21 31 20.5	25.22	16 15.05	70.09	11 34.45	0.888
Wed.	31	16 25 48.24	10.776	S.21 41 13.5	−24.19	16 15.20	70.18	11 12.79	0.917

Note.—The mean time of semidiameter passing the meridian may be found by subtracting $0^s.18$ from the sidereal time.

The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S				Equation of Time, to be Added to Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		Apparent Right Ascension.	Diff. for 1 Hour.	Apparent Declination.	Diff. for 1 Hour.			
		h m s	s	° ′ ″	″	m s	s	h m s
Mon.	1	14 22 27.02	9.768	S. 14 10 37.5	−48.57	16 19.14	0.088	14 38 46.16
Tues.	2	14 26 21.87	9.802	14 29 56.6	48.00	16 20.85	0.054	14 42 42.72
Wed.	3	14 30 17.52	9.836	14 49 1.7	47.41	16 21.75	0.020	14 46 39.27
Thur.	4	14 34 14.01	9.870	15 7 52.4	−46.80	16 21.82	0.015	14 50 35.83
Fri.	5	14 38 11.32	9.905	15 26 28.3	46.18	16 21.06	0.049	14 54 32.38
Sat.	6	14 42 9.47	9.940	15 44 49.0	45.54	16 19.47	0.084	14 58 28.94
SUN.	7	14 46 8.46	9.975	16 2 54.0	−44.87	16 17.04	0.119	15 2 25.50
Mon.	8	14 50 8.28	10.010	16 20 42.8	44.19	16 13.77	0.154	15 6 22.05
Tues.	9	14 54 8.94	10.045	16 38 15.2	43.49	16 9.67	0.188	15 10 18.61
Wed.	10	14 58 10.43	10.080	16 55 30.5	−42.78	16 4.73	0.223	15 14 15.16
Thur.	11	15 2 12.76	10.114	17 12 28.5	42.04	15 58.97	0.258	15 18 11.72
Fri.	12	15 6 15.91	10.149	17 29 8.6	41.29	15 52.37	0.292	15 22 8.28
Sat.	13	15 10 19.90	10.183	17 45 30.6	−40.53	15 44.94	0.327	15 26 4.84
SUN.	14	15 14 24.71	10.218	18 1 34.1	39.75	15 36.68	0.361	15 30 1.39
Mon.	15	15 18 30.35	10.252	18 17 18.5	38.95	15 27.60	0.396	15 33 57.95
Tues.	16	15 22 36.82	10.287	18 32 43.7	−38.14	15 17.69	0.430	15 37 54.51
Wed.	17	15 26 44.11	10.321	18 47 49.2	37.31	15 6.95	0.465	15 41 51.06
Thur.	18	15 30 52.23	10.356	19 2 34.6	36.47	14 55.39	0.499	15 45 47.62
Fri.	19	15 35 1.17	10.390	19 16 59.6	−35.61	14 43.01	0.533	15 49 44.18
Sat.	20	15 39 10.93	10.424	19 31 3.8	34.74	14 29.81	0.567	15 53 40.73
SUN.	21	15 43 21.50	10.457	19 44 46.9	33.85	14 15.79	0.601	15 57 37.29
Mon.	22	15 47 32.88	10.491	19 58 8.4	−32.95	14 0.96	0.634	16 1 33.85
Tues.	23	15 51 45.07	10.524	20 11 8.1	32.03	13 45.34	0.668	16 5 30.41
Wed.	24	15 55 58.05	10.557	20 23 45.7	31.10	13 28.91	0.701	16 9 26.96
Thur.	25	16 0 11.82	10.590	20 36 0.6	−30.15	13 11.70	0.733	16 13 23.52
Fri.	26	16 4 26.36	10.622	20 47 52.7	29.19	12 53.72	0.765	16 17 20.08
Sat.	27	16 8 41.67	10.653	20 59 21.5	28.21	12 34.97	0.797	16 21 16.64
SUN.	28	16 12 57.72	10.684	21 10 26.8	−27.22	12 15.47	0.828	16 25 13.20
Mon.	29	16 17 14.52	10.715	21 21 8.2	26.22	11 55.23	0.858	16 29 9.75
Tues.	30	16 21 32.04	10.745	21 31 25.3	25.21	11 34.28	0.888	16 33 6.31
Wed.	31	16 25 50.25	10.773	S. 21 41 18.0	−24.18	11 12.62	0.917	16 37 2.87

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing.

Diff. for 1 Hour, $+9^s.8565$. (Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S							Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.		
		True Longitude.					Diff. for 1 Hour.	Latitude.					
		λ			λ′								
		°	′	″	′	″	″	″			h	m	s
1	305	217	59	13.1	58	20.2	150.14	−0.20	9.996 6623	−45.9	9	19	41.89
2	306	218	59	17.4	58	24.4	150.23	0.32	9.996 5525	45.6	9	15	45.98
3	307	219	59	23.9	58	30.7	150.31	0.42	9.996 4435	45.3	9	11	50.07
4	308	220	59	32.4	58	39.1	150.40	−0.50	9.996 3350	−45.1	9	7	54.16
5	309	221	59	43.0	58	49.5	150.48	0.56	9.996 2272	44.9	9	3	58.25
6	310	222	59	55.5	59	1.9	150.56	0.60	9.996 1197	44.6	9	0	2.34
7	311	223	60	9.8	59	16.1	150.63	−0.62	9.996 0128	−44.4	8	56	6.43
8	312	224	60	26.0	59	32.0	150.70	0.60	9.995 9063	44.2	8	52	10.52
9	313	225	60	43.8	59	49.7	150.77	0.54	9.995 8004	44.0	8	48	14.61
10	314	227	1	3.1	0	8.9	150.84	−0.45	9.995 6951	−43.7	8	44	18.70
11	315	228	1	23.9	0	29.6	150.90	0.35	9.995 5906	43.4	8	40	22.79
12	316	229	1	46.2	0	51.7	150.96	0.22	9.995 4870	43.0	8	36	26.88
13	317	230	2	9.8	1	15.2	151.02	−0.08	9.995 3845	−42.5	8	32	30.97
14	318	231	2	34.8	1	40.0	151.08	+0.05	9.995 2833	41.9	8	28	35.06
15	319	232	3	1.1	2	6.1	151.14	0.17	9.995 1835	41.2	8	24	39.15
16	320	233	3	28.8	2	33.6	151.19	+0.28	9.995 0854	−40.5	8	20	43.24
17	321	234	3	57.7	3	2.4	151.24	0.37	9.994 9890	39.8	8	16	47.33
18	322	235	4	28.0	3	32.6	151.30	0.44	9.994 8945	39.0	8	12	51.42
19	323	236	4	59.7	4	4.1	151.35	+0.48	9.994 8020	−38.2	8	8	55.50
20	324	237	5	32.8	4	37.0	151.41	0.49	9.994 7116	37.3	8	4	59.59
21	325	238	6	7.3	5	11.4	151.47	0.47	9.994 6232	36.4	8	1	3.68
22	326	239	6	43.3	5	47.2	151.53	+0.43	9.994 5370	−35.5	7	57	7.77
23	327	240	7	20.8	6	24.4	151.59	0.37	9.994 4529	34.6	7	53	11.86
24	328	241	7	59.7	7	3.1	151.65	0.28	9.994 3710	33.7	7	49	15.95
25	329	242	8	40.1	7	43.4	151.72	+0.17	9.994 2913	−32.8	7	45	20.04
26	330	243	9	22.1	8	25.2	151.78	+0.05	9.994 2137	31.9	7	41	24.12
27	331	244	10	5.6	9	8.5	151.84	−0.07	9.994 1381	31.1	7	37	28.21
28	332	245	10	50.6	9	53.4	151.90	−0.19	9.994 0646	−30.2	7	33	32.30
29	333	246	11	37.2	10	39.8	151.97	0.31	9.993 9930	29.4	7	29	36.39
30	334	247	12	25.2	11	27.6	152.03	0.41	9.993 9233	28.7	7	25	40.48
31	335	248	13	14.8	12	17.0	152.09	−0.50	9.993 8554	−28.0	7	21	44.56

Note.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour, $-9^{s}.8296$. (Table II.)

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 18.2	15 24.8	56 3.82	+1.969	56 28.35	+2.115	19 36.3	1.86	23.6
2	15 32.0	15 39.4	56 54.47	2.232	57 21.78	2.313	20 21.2	1.89	24.6
3	15 47.0	15 54.7	57 49.82	2.353	58 18.06	2.345	21 7.4	1.97	25.6
4	16 2.3	16 9.6	58 45.90	+2.286	59 12.70	+2.171	21 56.3	2.11	26.6
5	16 16.5	16 22.6	59 37.78	1.999	60 0.46	1.772	22 49.0	2.30	27.6
6	16 28.0	16 32.4	60 20.10	1.494	60 36.14	1.174	23 46.7	2.51	28.6
7	16 35.6	16 37.7	60 48.15	+0.823	60 55.80	+0.449	☌	. .	0.2
8	16 38.6	16 38.2	60 58.91	+0.070	60 57.51	−0.301	0 49.1	2.68	1.2
9	16 36.6	16 34.0	60 51.77	−0.651	60 42.00	0.970	1 54.6	2.75	2.2
10	16 30.3	16 25.8	60 28.64	−1.249	60 12.21	−1.481	3 0.2	2.68	3.2
11	16 20.7	16 15.0	59 53.29	1.664	59 32.46	1.799	4 2.7	2.51	4.2
12	16 9.0	16 2.7	59 10.31	1.886	58 47.36	1.932	5 0.2	2.28	5.2
13	15 56.4	15 50.1	58 24.10	−1.939	58 0.96	−1.913	5 52.4	2.07	6.2
14	15 43.9	15 37.9	57 38.28	1.864	57 16.31	1.795	6 40.3	1.92	7.2
15	15 32.2	15 26.7	56 55.26	1.711	56 35.30	1.616	7 25.1	1.82	8.2
16	15 21.6	15 16.8	56 16.51	−1.515	55 58.95	−1.411	8 8.1	1.78	9.2
17	15 12.4	15 8.3	55 42.65	1.306	55 27.59	1.204	8 50.7	1.78	10.2
18	15 4.5	15 1.1	55 13.75	1.103	55 1.11	1.004	9 33.9	1.82	11.2
19	14 57.9	14 55.1	54 49.63	−0.910	54 39.26	−0.818	10 18.4	1.89	12.2
20	14 52.6	14 50.4	54 29.99	0.726	54 21.83	0.633	11 5.0	1.98	13.2
21	14 48.4	14 46.8	54 14.80	0.538	54 8.92	0.441	11 53.6	2.06	14.2
22	14 45.6	14 44.6	54 4.22	−0.341	54 0.76	−0.234	12 43.8	2.11	15.2
23	14 44.0	14 43.9	53 58.64	−0.119	53 57.94	+0.003	13 34.6	2.12	16.2
24	14 44.1	14 44.8	53 58.75	+0.134	54 1.20	0.276	14 25.0	2.08	17.2
25	14 45.9	14 47.6	54 5.41	+0.427	54 11.49	+0.588	15 14.0	2.00	18.2
26	14 49.8	14 52.5	54 19.55	0.757	54 29.69	0.934	16 1.0	1.92	19.2
27	14 55.9	14 59.8	54 41.99	1.117	54 56.51	1.304	16 46.2	1.85	20.2
28	15 4.4	15 9.6	55 13.29	+1.492	55 32.31	+1.677	17 30.0	1.81	21.2
29	15 15.4	15 21.7	55 53.50	1.854	56 16.76	2.020	18 13.4	1.81	22.2
30	15 28.5	15 35.8	56 41.91	2.168	57 8.69	2.291	18 57.3	1.86	23.2
31	15 43.5	15 51.4	57 36.77	+2.383	58 5.73	+2.437	19 43.2	1.98	24.2

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	MONDAY 1.					WEDNESDAY 3.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 39 38.25	1.9778	N. 13 6 57.8	12.851	0	11 14 33.02	2.0043	N. 1 41 44.7	15.363
1	9 41 36.89	1.9768	12 54 4.6	12.923	1	11 16 33.35	2.0067	1 26 22.0	15.39
2	9 43 35.47	1.9758	12 41 7.1	12.993	2	11 18 33.82	2.0091	1 10 57.7	15.42
3	9 45 33.99	1.9749	12 28 5.4	13.063	3	11 20 34.44	2.0117	0 55 31.7	15.44
4	9 47 32.46	1.9741	12 14 59.5	13.133	4	11 22 35.22	2.0143	0 40 4.2	15.471
5	9 49 30.88	1.9733	12 1 49.5	13.201	5	11 24 36.16	2.0170	0 24 35.2	15.49
6	9 51 29.25	1.9725	11 48 35.4	13.269	6	11 26 37.26	2.0198	N. 0 9 4.7	15.520
7	9 53 27.58	1.9719	11 35 17.2	13.337	7	11 28 38.54	2.0228	S. 0 6 27.2	15.541
8	9 55 25.88	1.9713	11 21 55.0	13.403	8	11 30 39.99	2.0258	0 22 0.3	15.562
9	9 57 24.14	1.9708	11 8 28.8	13.469	9	11 32 41.63	2.0288	0 37 34.6	15.582
10	9 59 22.37	1.9703	10 54 58.7	13.534	10	11 34 43.45	2.0319	0 53 10.1	15.601
11	10 1 20.57	1.9698	10 41 24.7	13.598	11	11 36 45.46	2.0352	1 8 46.7	15.618
12	10 3 18.75	1.9695	10 27 46.9	13.662	12	11 38 47.67	2.0385	1 24 24.2	15.633
13	10 5 16.91	1.9693	10 14 5.3	13.724	13	11 40 50.08	2.0419	1 40 2.6	15.648
14	10 7 15.06	1.9690	10 0 20.0	13.786	14	11 42 52.70	2.0454	1 55 41.9	15.660
15	10 9 13.19	1.9688	9 46 31.0	13.847	15	11 44 55.53	2.0489	2 11 22.0	15.674
16	10 11 11.32	1.9688	9 32 38.4	13.907	16	11 46 58.57	2.0526	2 27 2.8	15.684
17	10 13 9.45	1.9688	9 18 42.2	13.967	17	11 49 1.84	2.0563	2 42 44.1	15.693
18	10 15 7.57	1.9688	9 4 42.4	14.025	18	11 51 5.33	2.0602	2 58 25.9	15.701
19	10 17 5.70	1.9689	8 50 39.2	14.083	19	11 53 9.06	2.0641	3 14 8.2	15.708
20	10 19 3.84	1.9691	8 36 32.5	14.140	20	11 55 13.02	2.0681	3 29 50.8	15.713
21	10 21 1.99	1.9693	8 22 22.4	14.196	21	11 57 17.23	2.0722	3 45 33.7	15.717
22	10 23 0.15	1.9696	8 8 9.0	14.251	22	11 59 21.68	2.0763	4 1 16.8	15.719
23	10 24 58.34	1.9701	N. 7 53 52.3	14.306	23	12 1 26.39	2.0807	S. 4 17 0.0	15.720
	TUESDAY 2.					THURSDAY 4.			
0	10 26 56.56	1.9706	N. 7 39 32.3	14.359	0	12 3 31.36	2.0850	S. 4 32 43.2	15.719
1	10 28 54.81	1.9711	7 25 9.2	14.412	1	12 5 36.59	2.0894	4 48 26.3	15.718
2	10 30 53.09	1.9717	7 10 42.9	14.464	2	12 7 42.09	2.0939	5 4 9.3	15.714
3	10 32 51.41	1.9723	6 56 13.5	14.515	3	12 9 47.86	2.0985	5 19 52.0	15.709
4	10 34 49.77	1.9731	6 41 41.1	14.564	4	12 11 53.91	2.1033	5 35 34.4	15.703
5	10 36 48.18	1.9739	6 27 5.8	14.613	5	12 14 0.25	2.1080	5 51 16.3	15.694
6	10 38 46.64	1.9748	6 12 27.5	14.662	6	12 16 6.87	2.1128	6 6 57.7	15.684
7	10 40 45.15	1.9758	5 57 46.3	14.709	7	12 18 13.78	2.1178	6 22 38.4	15.673
8	10 42 43.73	1.9768	5 43 2.4	14.755	8	12 20 21.00	2.1228	6 38 18.5	15.662
9	10 44 42.37	1.9779	5 28 15.7	14.801	9	12 22 28.52	2.1279	6 53 57.8	15.647
10	10 46 41.08	1.9792	5 13 26.3	14.845	10	12 24 36.35	2.1331	7 9 36.1	15.631
11	10 48 39.87	1.9805	4 58 34.3	14.888	11	12 26 44.49	2.1384	7 25 13.5	15.613
12	10 50 38.74	1.9818	4 43 39.7	14.932	12	12 28 52.96	2.1438	7 40 49.7	15.593
13	10 52 37.69	1.9833	4 28 42.5	14.973	13	12 31 1.75	2.1492	7 56 24.7	15.573
14	10 54 36.73	1.9848	4 13 42.9	15.013	14	12 33 10.86	2.1547	8 11 58.4	15.550
15	10 56 35.86	1.9863	3 58 40.9	15.053	15	12 35 20.31	2.1603	8 27 30.7	15.526
16	10 58 35.09	1.9880	3 43 36.6	15.092	16	12 37 30.10	2.1660	8 43 1.5	15.500
17	11 0 34.42	1.9898	3 28 29.9	15.129	17	12 39 40.23	2.1718	8 58 30.7	15.473
18	11 2 33.86	1.9916	3 13 21.1	15.165	18	12 41 50.71	2.1776	9 13 58.2	15.443
19	11 4 33.41	1.9935	2 58 10.1	15.202	19	12 44 1.54	2.1835	9 29 23.9	15.412
20	11 6 33.08	1.9955	2 42 56.9	15.237	20	12 46 12.73	2.1895	9 44 47.6	15.378
21	11 8 32.87	1.9976	2 27 41.7	15.269	21	12 48 24.28	2.1956	10 0 9.3	15.343
22	11 10 32.79	1.9998	2 12 24.6	15.301	22	12 50 36.20	2.2018	10 15 28.8	15.307
23	11 12 32.84	2.0019	1 57 5.6	15.333	23	12 52 48.49	2.2080	10 30 46.1	15.268
24	11 14 33.02	2.0043	N. 1 41 44.7	15.363	24	12 55 1.16	2.2143	S. 10 46 1.0	15.228

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

our.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 5.			
	h m s	s	° ′ ″	″
0	12 55 1.16	2.2143	S. 10 46 1.0	15.228
1	12 57 14.21	2.2207	11 1 13.4	15.185
2	12 59 27.64	2.2271	11 16 23.2	15.141
3	13 1 41.46	2.2337	11 31 30.3	15.095
4	13 3 55.68	2.2403	11 46 34.6	15.047
5	13 6 10.29	2.2468	12 1 35.9	14.997
6	13 8 25.30	2.2536	12 16 34.2	14.945
7	13 10 40.72	2.2604	12 31 29.3	14.891
8	13 12 56.55	2.2673	12 46 21.1	14.835
9	13 15 12.80	2.2743	13 1 9.5	14.777
10	13 17 29.46	2.2813	13 15 54.3	14.716
11	13 19 46.55	2.2883	13 30 35.4	14.654
12	13 22 4.06	2.2954	13 45 12.8	14.591
13	13 24 22.00	2.3026	13 59 46.3	14.525
14	13 26 40.37	2.3098	14 14 15.8	14.457
15	13 28 59.18	2.3171	14 28 41.1	14.387
16	13 31 18.42	2.3244	14 43 2.2	14.314
17	13 33 38.11	2.3318	14 57 18.8	14.239
18	13 35 58.24	2.3393	15 11 30.9	14.163
19	13 38 18.82	2.3468	15 25 38.4	14.085
20	13 40 39.85	2.3543	15 39 41.1	14.004
21	13 43 1.33	2.3618	15 53 38.9	13.921
22	13 45 23.27	2.3694	16 7 31.6	13.836
23	13 47 45.66	2.3770	S. 16 21 19.2	13.748
	SATURDAY 6.			
0	13 50 8.51	2.3847	S. 16 35 1.4	13.658
1	13 52 31.82	2.3924	16 48 38.2	13.567
2	13 54 55.60	2.4002	17 2 9.4	13.473
3	13 57 19.84	2.4079	17 15 35.0	13.378
4	13 59 44.55	2.4158	17 28 54.7	13.279
5	14 2 9.73	2.4235	17 42 8.5	13.178
6	14 4 35.37	2.4313	17 55 16.1	13.075
7	14 7 1.49	2.4393	18 8 17.5	12.971
8	14 9 28.08	2.4470	18 21 12.6	12.864
9	14 11 55.13	2.4548	18 34 1.2	12.754
10	14 14 22.66	2.4628	18 46 43.1	12.643
11	14 16 50.66	2.4707	18 59 18.3	12.529
12	14 19 19.14	2.4786	19 11 46.6	12.413
13	14 21 48.09	2.4864	19 24 7.9	12.295
14	14 24 17.51	2.4943	19 36 22.0	12.174
15	14 26 47.40	2.5021	19 48 28.8	12.052
16	14 29 17.76	2.5100	20 0 28.2	11.927
17	14 31 48.60	2.5178	20 12 20.0	11.800
18	14 34 19.90	2.5256	20 24 4.2	11.671
19	14 36 51.67	2.5333	20 35 40.5	11.538
20	14 39 23.90	2.5411	20 47 8.8	11.405
21	14 41 56.60	2.5488	20 58 29.1	11.269
22	14 44 29.76	2.5565	21 9 41.1	11.131
23	14 47 3.38	2.5641	21 20 44.8	10.991
24	14 49 37.45	2.5717	S. 21 31 40.0	10.848

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 7.			
	h m s	s	° ′ ″	″
0	14 49 37.45	2.5717	S. 21 31 40.0	10.848
1	14 52 11.98	2.5793	21 42 26.6	10.704
2	14 54 46.96	2.5868	21 53 4.5	10.558
3	14 57 22.39	2.5941	22 3 33.5	10.409
4	14 59 58.25	2.6014	22 13 53.6	10.258
5	15 2 34.56	2.6088	22 24 4.5	10.105
6	15 5 11.31	2.6160	22 34 6.2	9.951
7	15 7 48.48	2.6231	22 43 58.6	9.794
8	15 10 26.08	2.6302	22 53 41.5	9.635
9	15 13 4.10	2.6371	23 3 14.8	9.474
10	15 15 42.53	2.6439	23 12 38.4	9.312
11	15 18 21.37	2.6508	23 21 52.2	9.147
12	15 21 0.62	2.6575	23 30 56.0	8.980
13	15 23 40.27	2.6641	23 39 49.8	8.812
14	15 26 20.31	2.6706	23 48 33.4	8.641
15	15 29 0.74	2.6769	23 57 6.7	8.468
16	15 31 41.54	2.6832	24 5 29.6	8.295
17	15 34 22.72	2.6893	24 13 42.1	8.120
18	15 37 4.26	2.6953	24 21 44.0	7.942
19	15 39 46.15	2.7012	24 29 35.1	7.763
20	15 42 28.40	2.7069	24 37 15.5	7.583
21	15 45 10.98	2.7125	24 44 45.0	7.400
22	15 47 53.90	2.7180	24 52 3.5	7.216
23	15 50 37.14	2.7233	S. 24 59 10.9	7.031
	MONDAY 8.			
0	15 53 20.70	2.7286	S. 25 6 7.2	6.844
1	15 56 4.57	2.7336	25 12 52.2	6.656
2	15 58 48.73	2.7384	25 19 25.9	6.466
3	16 1 33.18	2.7431	25 25 48.1	6.274
4	16 4 17.90	2.7476	25 31 58.8	6.082
5	16 7 2.89	2.7520	25 37 57.9	5.888
6	16 9 48.14	2.7562	25 43 45.4	5.694
7	16 12 33.63	2.7602	25 49 21.2	5.498
8	16 15 19.36	2.7640	25 54 45.2	5.301
9	16 18 5.31	2.7676	25 59 57.3	5.102
10	16 20 51.47	2.7711	26 4 57.4	4.903
11	16 23 37.84	2.7744	26 9 45.6	4.703
12	16 26 24.40	2.7775	26 14 21.8	4.502
13	16 29 11.14	2.7804	26 18 45.8	4.299
14	16 31 58.05	2.7831	26 22 57.7	4.097
15	16 34 45.11	2.7855	26 26 57.4	3.893
16	16 37 32.31	2.7878	26 30 44.8	3.688
17	16 40 19.65	2.7900	26 34 20.0	3.483
18	16 43 7.11	2.7918	26 37 42.8	3.278
19	16 45 54.67	2.7934	26 40 53.3	3.072
20	16 48 42.32	2.7949	26 43 51.4	2.865
21	16 51 30.06	2.7963	26 46 37.1	2.658
22	16 54 17.87	2.7973	26 49 10.4	2.451
23	16 57 5.73	2.7981	26 51 31.2	2.243
24	16 59 53.64	2.7987	S. 26 53 39.6	2.035

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min
	TUESDAY 9.					THURSDAY 11.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	16 59 53.64	2.7987	S. 26 53 39.6	2.035	0	19 11 4.97	2.6009	S. 24 39 56.5	7.21
1	17 2 41.58	2.7991	26 55 35.4	1.827	1	19 13 40.79	2.5933	24 32 38.7	7.37
2	17 5 29.53	2.7993	26 57 18.8	1.618	2	19 16 16.16	2.5856	24 25 11.4	7.53
3	17 8 17.49	2.7993	26 58 49.6	1.410	3	19 18 51.06	2.5778	24 17 34.7	7.69
4	17 11 5.44	2.7990	27 0 8.0	1.202	4	19 21 25.49	2.5699	24 9 48.6	7.84
5	17 13 53.37	2.7985	27 1 13.8	0.993	5	19 23 59.45	2.5621	24 1 53.3	7.99
6	17 16 41.26	2.7978	27 2 7.1	0.785	6	19 26 32.94	2.5541	23 53 48.9	8.14
7	17 19 29.11	2.7970	27 2 48.0	0.578	7	19 29 5.94	2.5460	23 45 35.5	8.29
8	17 22 16.90	2.7958	27 3 16.4	0.369	8	19 31 38.46	2.5379	23 37 13.1	8.44
9	17 25 4.61	2.7945	27 3 32.3	−0.162	9	19 34 10.49	2.5298	23 28 42.0	8.59
10	17 27 52.24	2.7930	27 3 35.8	+0.046	10	19 36 42.03	2.5216	23 20 2.3	8.73
11	17 30 39.77	2.7913	27 3 26.8	0.253	11	19 39 13.08	2.5134	23 11 14.0	8.87
12	17 33 27.19	2.7893	27 3 5.4	0.460	12	19 41 43.64	2.5052	23 2 17.3	9.01
13	17 36 14.48	2.7871	27 2 31.6	0.666	13	19 44 13.70	2.4968	22 53 12.3	9.15
14	17 39 1.64	2.7848	27 1 45.5	0.871	14	19 46 43.26	2.4886	22 43 59.1	9.28
15	17 41 48.65	2.7822	27 0 47.1	1.076	15	19 49 12.33	2.4803	22 34 37.8	9.42
16	17 44 35.50	2.7793	26 59 36.4	1.280	16	19 51 40.89	2.4719	22 25 8.6	9.55
17	17 47 22.17	2.7763	26 58 13.5	1.483	17	19 54 8.96	2.4636	22 15 31.5	9.68
18	17 50 8.66	2.7732	26 56 38.4	1.687	18	19 56 36.52	2.4552	22 5 46.7	9.81
19	17 52 54.95	2.7698	26 54 51.1	1.889	19	19 59 3.58	2.4468	21 55 54.3	9.95
20	17 55 41.04	2.7663	26 52 51.7	2.090	20	20 1 30.14	2.4385	21 45 54.3	10.08
21	17 58 26.90	2.7624	26 50 40.3	2.291	21	20 3 56.20	2.4301	21 35 47.0	10.1
22	18 1 12.53	2.7585	26 48 16.8	2.491	22	20 6 21.75	2.4217	21 25 32.4	10.3
23	18 3 57.92	2.7544	S. 26 45 41.4	2.688	23	20 8 46.80	2.4133	S. 21 15 10.6	10.4
	WEDNESDAY 10.					FRIDAY 12.			
0	18 6 43.06	2.7501	S. 26 42 54.2	2.886	0	20 11 11.35	2.4049	S. 21 4 41.8	10.5
1	18 9 27.93	2.7455	26 39 55.1	3.083	1	20 13 35.39	2.3966	20 54 6.1	10.65
2	18 12 12.52	2.7408	26 36 44.3	3.278	2	20 15 58.94	2.3883	20 43 23.5	10.7
3	18 14 56.82	2.7359	26 33 21.8	3.472	3	20 18 21.99	2.3800	20 32 34.3	10.87
4	18 17 40.83	2.7309	26 29 47.7	3.664	4	20 20 44.54	2.3718	20 21 38.5	10.98
5	18 20 24.53	2.7258	26 26 2.1	3.856	5	20 23 6.60	2.3635	20 10 36.2	11.09
6	18 23 7.92	2.7204	26 22 5.0	4.046	6	20 25 28.16	2.3552	19 59 27.5	11.19
7	18 25 50.98	2.7148	26 17 56.6	4.235	7	20 27 49.22	2.3469	19 48 12.6	11.30
8	18 28 33.70	2.7092	26 13 36.8	4.423	8	20 30 9.79	2.3388	19 36 51.5	11.40
9	18 31 16.08	2.7034	26 9 5.8	4.609	9	20 32 29.88	2.3308	19 25 24.4	11.50
10	18 33 58.11	2.6975	26 4 23.7	4.794	10	20 34 49.48	2.3226	19 13 51.4	11.59
11	18 36 39.78	2.6913	25 59 30.5	4.978	11	20 37 8.59	2.3145	19 2 12.5	11.69
12	18 39 21.07	2.6850	25 54 26.3	5.160	12	20 39 27.22	2.3065	18 50 28.0	11.78
13	18 42 1.98	2.6787	25 49 11.3	5.340	13	20 41 45.37	2.2985	18 38 37.8	11.8
14	18 44 42.51	2.6722	25 43 45.5	5.519	14	20 44 3.04	2.2906	18 26 42.1	11.97
15	18 47 22.64	2.6655	25 38 9.0	5.696	15	20 46 20.24	2.2828	18 14 41.1	12.06
16	18 50 2.37	2.6588	25 32 22.0	5.872	16	20 48 36.97	2.2749	18 2 34.8	12.14
17	18 52 41.69	2.6519	25 26 24.4	6.046	17	20 50 53.23	2.2671	17 50 23.3	12.23
18	18 55 20.60	2.6449	25 20 16.5	6.218	18	20 53 9.02	2.2593	17 38 6.8	12.31
19	18 57 59.08	2.6378	25 13 58.3	6.388	19	20 55 24.35	2.2517	17 25 45.3	12.39
20	19 0 37.14	2.6307	25 7 29.9	6.558	20	20 57 39.22	2.2441	17 13 19.0	12.47
21	19 3 14.76	2.6233	25 0 51.4	6.725	21	20 59 53.64	2.2366	17 0 48.0	12.55
22	19 5 51.94	2.6160	24 54 2.9	6.890	22	21 2 7.61	2.2291	16 48 12.3	12.63
23	19 8 28.68	2.6086	24 47 4.6	7.053	23	21 4 21.13	2.2216	16 35 32.1	12.70
24	19 11 4.97	2.6009	S. 24 39 56.5	7.216	24	21 6 34.20	2.2143	S. 16 22 47.4	12.78

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

our.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
SATURDAY 13.					MONDAY 15.				
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	21 6 34.20	2.2143	S. 16 22 47.4	12.782	0	22 45 50.37	1.9541	S. 5 13 2.8	14.614
1	21 8 46.84	2.2070	16 9 58.3	12.853	1	22 47 47.51	1.9508	4 58 25.7	14.623
2	21 10 59.04	2.1998	15 57 5.0	12.923	2	22 49 44.46	1.9476	4 43 48.1	14.629
3	21 13 10.81	2.1926	15 44 7.5	12.992	3	22 51 41.22	1.9444	4 29 10.2	14.635
4	21 15 22.15	2.1855	15 31 6.0	13.058	4	22 53 37.79	1.9413	4 14 31.9	14.640
5	21 17 33.07	2.1785	15 18 0.5	13.124	5	22 55 34.18	1.9383	3 59 53.4	14.643
6	21 19 43.57	2.1716	15 4 51.1	13.188	6	22 57 30.39	1.9354	3 45 14.7	14.647
7	21 21 53.66	2.1648	14 51 37.9	13.250	7	22 59 26.43	1.9326	3 30 35.8	14.649
8	21 24 3.34	2.1579	14 38 21.1	13.310	8	23 1 22.30	1.9298	3 15 56.8	14.650
9	21 26 12.61	2.1512	14 25 0.7	13.369	9	23 3 18.01	1.9272	3 1 17.8	14.650
10	21 28 21.48	2.1445	14 11 36.8	13.427	10	23 5 13.56	1.9247	2 46 38.8	14.649
11	21 30 29.95	2.1379	13 58 9.5	13.483	11	23 7 8.97	1.9223	2 31 59.9	14.647
12	21 32 38.03	2.1315	13 44 38.8	13.538	12	23 9 4.23	1.9198	2 17 21.2	14.643
13	21 34 45.73	2.1251	13 31 4.9	13.591	13	23 10 59.35	1.9175	2 2 42.7	14.639
14	21 36 53.04	2.1188	13 17 27.9	13.642	14	23 12 54.33	1.9153	1 48 4.5	14.634
15	21 38 59.98	2.1125	13 3 47.9	13.692	15	23 14 49.18	1.9132	1 33 26.6	14.628
16	21 41 6.54	2.1063	12 50 4.9	13.741	16	23 16 43.91	1.9111	1 18 49.1	14.621
17	21 43 12.74	2.1003	12 36 19.0	13.788	17	23 18 38.51	1.9091	1 4 12.1	14.613
18	21 45 18.57	2.0943	12 22 30.3	13.834	18	23 20 33.00	1.9072	0 49 35.5	14.605
19	21 47 24.05	2.0884	12 8 38.9	13.878	19	23 22 27.37	1.9053	0 34 59.5	14.595
20	21 49 29.18	2.0826	11 54 44.9	13.922	20	23 24 21.64	1.9036	0 20 24.1	14.585
21	21 51 33.96	2.0768	11 40 48.3	13.963	21	23 26 15.80	1.9019	S. 0 5 49.3	14.573
22	21 53 38.39	2.0711	11 26 49.3	14.003	22	23 28 9.87	1.9004	N. 0 8 44.7	14.560
23	21 55 42.49	2.0655	S. 11 12 47.9	14.043	23	23 30 3.85	1.8989	N. 0 23 17.9	14.547
SUNDAY 14.					TUESDAY 16.				
0	21 57 46.25	2.0600	S. 10 58 44.2	14.080	0	23 31 57.74	1.8975	N. 0 37 50.3	14.533
1	21 59 49.69	2.0546	10 44 38.3	14.116	1	23 33 51.55	1.8962	0 52 21.8	14.518
2	22 1 52.80	2.0493	10 30 30.3	14.151	2	23 35 45.28	1.8949	1 6 52.4	14.502
3	22 3 55.60	2.0440	10 16 20.2	14.185	3	23 37 38.94	1.8938	1 21 22.0	14.484
4	22 5 58.08	2.0388	10 2 8.1	14.218	4	23 39 32.53	1.8926	1 35 50.5	14.466
5	22 8 0.26	2.0338	9 47 54.1	14.248	5	23 41 26.05	1.8915	1 50 17.9	14.448
6	22 10 2.14	2.0288	9 33 38.3	14.278	6	23 43 19.51	1.8906	2 4 44.2	14.428
7	22 12 3.72	2.0239	9 19 20.8	14.307	7	23 45 12.92	1.8898	2 19 9.3	14.408
8	22 14 5.01	2.0191	9 5 1.5	14.335	8	23 47 6.28	1.8890	2 33 33.1	14.386
9	22 16 6.01	2.0144	8 50 40.6	14.361	9	23 48 59.60	1.8883	2 47 55.6	14.364
10	22 18 6.74	2.0098	8 36 18.2	14.386	10	23 50 52.87	1.8876	3 2 16.8	14.341
11	22 20 7.19	2.0053	8 21 54.3	14.409	11	23 52 46.11	1.8870	3 16 36.5	14.317
12	22 22 7.37	2.0008	8 7 29.1	14.432	12	23 54 39.31	1.8865	3 30 54.8	14.292
13	22 24 7.29	1.9964	7 53 2.5	14.453	13	23 56 32.49	1.8861	3 45 11.5	14.266
14	22 26 6.94	1.9921	7 38 34.7	14.473	14	23 58 25.64	1.8858	3 59 26.7	14.239
15	22 28 6.34	1.9879	7 24 5.7	14.493	15	0 0 18.78	1.8855	4 13 40.2	14.212
16	22 30 5.49	1.9838	7 9 35.6	14.511	16	0 2 11.90	1.8853	4 27 52.1	14.184
17	22 32 4.40	1.9798	6 55 4.4	14.528	17	0 4 5.01	1.8852	4 42 2.3	14.154
18	22 34 3.07	1.9759	6 40 32.3	14.543	18	0 5 58.12	1.8851	4 56 10.6	14.123
19	22 36 1.51	1.9721	6 25 59.3	14.558	19	0 7 51.22	1.8851	5 10 17.1	14.093
20	22 37 59.72	1.9683	6 11 25.4	14.571	20	0 9 44.33	1.8852	5 24 21.8	14.062
21	22 39 57.70	1.9646	5 56 50.8	14.583	21	0 11 37.44	1.8853	5 38 24.5	14.029
22	22 41 55.47	1.9610	5 42 15.4	14.595	22	0 13 30.56	1.8855	5 52 25.3	13.996
23	22 43 53.02	1.9575	5 27 39.4	14.605	23	0 15 23.70	1.8858	6 6 24.0	13.961
24	22 45 50.37	1.9541	S. 5 13 2.8	14.614	24	0 17 16.86	1.8863	N. 6 20 20.6	13.926

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 17.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	0 17 16.86	1.8863	N. 6 20 20.6	13.926
1	0 19 10.05	1.8867	6 34 15.1	13.890
2	0 21 3.26	1.8872	6 48 7.4	13.853
3	0 22 56.51	1.8878	7 1 57.5	13.816
4	0 24 49.79	1.8883	7 15 45.3	13.777
5	0 26 43.11	1.8890	7 29 30.7	13.738
6	0 28 36.47	1.8898	7 43 13.8	13.698
7	0 30 29.88	1.8906	7 56 54.4	13.657
8	0 32 23.34	1.8915	8 10 32.6	13.616
9	0 34 16.86	1.8925	8 24 8.3	13.573
10	0 36 10.44	1.8935	8 37 41.4	13.529
11	0 38 4.08	1.8946	8 51 11.8	13.484
12	0 39 57.79	1.8958	9 4 39.5	13.439
13	0 41 51.57	1.8969	9 18 4.5	13.393
14	0 43 45.42	1.8982	9 31 26.7	13.347
15	0 45 39.35	1.8995	9 44 46.1	13.300
16	0 47 33.36	1.9008	9 58 2.7	13.252
17	0 49 27.45	1.9023	10 11 16.3	13.202
18	0 51 21.63	1.9038	10 24 26.9	13.152
19	0 53 15.91	1.9054	10 37 34.5	13.101
20	0 55 10.28	1.9069	10 50 39.0	13.049
21	0 57 4.74	1.9086	11 3 40.4	12.997
22	0 58 59.31	1.9103	11 16 38.6	12.943
23	1 0 53.98	1.9121	N. 11 29 33.6	12.889

THURSDAY 18.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	1 2 48.76	1.9139	N. 11 42 25.3	12.834
1	1 4 43.65	1.9158	11 55 13.7	12.778
2	1 6 38.66	1.9178	12 7 58.7	12.721
3	1 8 33.79	1.9198	12 20 40.2	12.663
4	1 10 29.03	1.9218	12 33 18.3	12.606
5	1 12 24.40	1.9239	12 45 52.9	12.547
6	1 14 19.90	1.9261	12 58 23.9	12.487
7	1 16 15.53	1.9283	13 10 51.3	12.426
8	1 18 11.29	1.9304	13 23 15.0	12.364
9	1 20 7.18	1.9327	13 35 35.0	12.302
10	1 22 3.21	1.9351	13 47 51.2	12.238
11	1 23 59.39	1.9375	14 0 3.5	12.173
12	1 25 55.71	1.9398	14 12 12.0	12.109
13	1 27 52.17	1.9423	14 24 16.6	12.043
14	1 29 48.78	1.9448	14 36 17.2	11.976
15	1 31 45.55	1.9474	14 48 13.7	11.908
16	1 33 42.47	1.9499	15 0 6.2	11.840
17	1 35 39.54	1.9525	15 11 54.5	11.771
18	1 37 36.77	1.9552	15 23 38.7	11.702
19	1 39 34.16	1.9579	15 35 18.7	11.631
20	1 41 31.72	1.9607	15 46 54.4	11.559
21	1 43 29.44	1.9634	15 58 25.8	11.487
22	1 45 27.33	1.9663	16 9 52.8	11.413
23	1 47 25.39	1.9691	16 21 15.4	11.339
24	1 49 23.62	1.9719	N. 16 32 33.5	11.264

FRIDAY 19.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	1 49 23.62	1.9719	N. 16 32 33.5	11.264
1	1 51 22.02	1.9748	16 43 47.1	11.188
2	1 53 20.60	1.9778	16 54 56.1	11.113
3	1 55 19.36	1.9808	17 6 0.5	11.035
4	1 57 18.30	1.9838	17 17 0.3	10.957
5	1 59 17.42	1.9868	17 27 55.3	10.878
6	2 1 16.72	1.9898	17 38 45.6	10.798
7	2 3 16.20	1.9929	17 49 31.1	10.718
8	2 5 15.87	1.9960	18 0 11.7	10.636
9	2 7 15.72	1.9992	18 10 47.4	10.553
10	2 9 15.77	2.0023	18 21 18.1	10.470
11	2 11 16.00	2.0054	18 31 43.8	10.387
12	2 13 16.42	2.0086	18 42 4.5	10.302
13	2 15 17.03	2.0118	18 52 20.0	10.216
14	2 17 17.84	2.0151	19 2 30.4	10.130
15	2 19 18.84	2.0183	19 12 35.6	10.043
16	2 21 20.04	2.0216	19 22 35.5	9.956
17	2 23 21.43	2.0248	19 32 30.1	9.866
18	2 25 23.02	2.0282	19 42 19.4	9.777
19	2 27 24.81	2.0314	19 52 3.3	9.686
20	2 29 26.79	2.0347	20 1 41.7	9.595
21	2 31 28.97	2.0380	20 11 14.6	9.502
22	2 33 31.35	2.0413	20 20 41.9	9.409
23	2 35 33.93	2.0447	N. 20 30 3.7	9.316

SATURDAY 20.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	2 37 36.71	2.0480	N. 20 39 19.8	9.222
1	2 39 39.69	2.0513	20 48 30.3	9.127
2	2 41 42.87	2.0547	20 57 35.0	9.030
3	2 43 46.25	2.0579	21 6 33.9	8.933
4	2 45 49.82	2.0613	21 15 27.0	8.837
5	2 47 53.60	2.0647	21 24 14.3	8.738
6	2 49 57.58	2.0679	21 32 55.6	8.639
7	2 52 1.75	2.0713	21 41 31.0	8.539
8	2 54 6.13	2.0747	21 50 0.3	8.438
9	2 56 10.71	2.0779	21 58 23.6	8.338
10	2 58 15.48	2.0812	22 6 40.8	8.236
11	3 0 20.45	2.0845	22 14 51.9	8.133
12	3 2 25.62	2.0878	22 22 56.8	8.030
13	3 4 30.99	2.0911	22 30 55.5	7.926
14	3 6 36.55	2.0943	22 38 47.9	7.821
15	3 8 42.30	2.0974	22 46 34.0	7.715
16	3 10 48.24	2.1007	22 54 13.7	7.608
17	3 12 54.38	2.1039	23 1 47.0	7.502
18	3 15 0.71	2.1071	23 9 13.9	7.394
19	3 17 7.23	2.1103	23 16 34.3	7.286
20	3 19 13.94	2.1133	23 23 48.2	7.177
21	3 21 20.83	2.1164	23 30 55.5	7.067
22	3 23 27.91	2.1195	23 37 56.2	6.956
23	3 25 35.17	2.1226	23 44 50.2	6.845
24	3 27 42.62	2.1257	N. 23 51 37.6	6.734

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

r.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 21.					**TUESDAY 23.**			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
	3 27 42.62	2.1257	N. 23 51 37.6	6.734	0	5 12 21.47	2.2122	N. 26 56 14.7	0.813
	3 29 50.25	2.1286	23 58 18.3	6.622	1	5 14 34.21	2.2124	26 56 59.6	0.683
	3 31 58.05	2.1315	24 4 52.2	6.508	2	5 16 46.96	2.2126	26 57 36.7	0.553
	3 34 6.03	2.1345	24 11 19.3	6.395	3	5 18 59.72	2.2127	26 58 6.0	0.423
	3 36 14.19	2.1374	24 17 39.6	6.281	4	5 21 12.48	2.2126	26 58 27.5	0.294
	3 38 22.52	2.1403	24 23 53.0	6.166	5	5 23 25.23	2.2124	26 58 41.3	0.164
	3 40 31.02	2.1430	24 29 59.5	6.051	6	5 25 37.97	2.2123	26 58 47.2	+0.033
	3 42 39.68	2.1458	24 35 59.1	5.934	7	5 27 50.70	2.2121	26 58 45.3	−0.097
	3 44 48.51	2.1486	24 41 51.6	5.818	8	5 30 3.42	2.2118	26 58 35.6	0.226
	3 46 57.51	2.1513	24 47 37.2	5.701	9	5 32 16.12	2.2114	26 58 18.2	0.356
	3 49 6.66	2.1538	24 53 15.7	5.583	10	5 34 28.79	2.2109	26 57 52.9	0.486
	3 51 15.97	2.1565	24 58 47.2	5.465	11	5 36 41.43	2.2104	26 57 19.9	0.615
	3 53 25.44	2.1591	25 4 11.5	5.346	12	5 38 54.04	2.2098	26 56 39.1	0.745
	3 55 35.06	2.1616	25 9 28.7	5.227	13	5 41 6.61	2.2092	26 55 50.5	0.874
	3 57 44.83	2.1640	25 14 38.7	5.108	14	5 43 19.14	2.2084	26 54 54.2	1.003
	3 59 54.74	2.1664	25 19 41.6	4.988	15	5 45 31.62	2.2076	26 53 50.1	1.133
	4 2 4.80	2.1688	25 24 37.2	4.866	16	5 47 44.05	2.2068	26 52 38.3	1.262
	4 4 15.00	2.1712	25 29 25.5	4.744	17	5 49 56.43	2.2058	26 51 18.7	1.391
	4 6 25.34	2.1734	25 34 6.5	4.623	18	5 52 8.74	2.2047	26 49 51.4	1.519
	4 8 35.81	2.1757	25 38 40.2	4.501	19	5 54 20.99	2.2037	26 48 16.4	1.648
	4 10 46.42	2.1778	25 43 6.6	4.378	20	5 56 33.18	2.2025	26 46 33.7	1.776
	4 12 57.15	2.1799	25 47 25.6	4.255	21	5 58 45.29	2.2013	26 44 43.3	1.904
	4 15 8.01	2.1820	25 51 37.2	4.131	22	6 0 57.33	2.1999	26 42 45.2	2.032
	4 17 18.99	2.1839	N. 25 55 41.3	4.007	23	6 3 9.28	2.1985	N. 26 40 39.5	2.158
	MONDAY 22.					**WEDNESDAY 24.**			
0	4 19 30.08	2.1858	N. 25 59 38.0	3.883	0	6 5 21.15	2.1972	N. 26 38 26.2	2.286
1	4 21 41.28	2.1877	26 3 27.2	3.758	1	6 7 32.94	2.1957	26 36 5.2	2.413
2	4 23 52.60	2.1895	26 7 9.0	3.633	2	6 9 44.63	2.1941	26 33 36.7	2.539
3	4 26 4.02	2.1913	26 10 43.2	3.507	3	6 11 56.23	2.1925	26 31 0.5	2.666
4	4 28 15.55	2.1930	26 14 9.8	3.381	4	6 14 7.73	2.1908	26 28 16.8	2.791
5	4 30 27.18	2.1946	26 17 28.9	3.256	5	6 16 19.12	2.1890	26 25 25.6	2.917
6	4 32 38.90	2.1961	26 20 40.5	3.129	6	6 18 30.41	2.1873	26 22 26.8	3.043
7	4 34 50.71	2.1976	26 23 44.4	3.002	7	6 20 41.59	2.1854	26 19 20.5	3.168
8	4 37 2.61	2.1990	26 26 40.7	2.875	8	6 22 52.66	2.1836	26 16 6.7	3.292
9	4 39 14.59	2.2003	26 29 29.4	2.748	9	6 25 3.62	2.1816	26 12 45.5	3.416
10	4 41 26.65	2.2017	26 32 10.4	2.620	10	6 27 14.45	2.1795	26 9 16.8	3.540
11	4 43 38.79	2.2029	26 34 43.8	2.493	11	6 29 25.16	2.1774	26 5 40.7	3.663
12	4 45 51.00	2.2040	26 37 9.5	2.364	12	6 31 35.74	2.1753	26 1 57.2	3.787
13	4 48 3.27	2.2051	26 39 27.5	2.236	13	6 33 46.19	2.1731	25 58 6.3	3.909
14	4 50 15.61	2.2062	26 41 37.8	2.108	14	6 35 56.51	2.1709	25 54 8.1	4.032
15	4 52 28.01	2.2071	26 43 40.4	1.979	15	6 38 6.70	2.1686	25 50 2.5	4.153
16	4 54 40.46	2.2079	26 45 35.3	1.850	16	6 40 16.74	2.1662	25 45 49.7	4.274
17	4 56 52.96	2.2087	26 47 22.4	1.720	17	6 42 26.64	2.1638	25 41 29.6	4.395
18	4 59 5.50	2.2094	26 49 1.7	1.591	18	6 44 36.40	2.1615	25 37 2.3	4.515
19	5 1 18.09	2.2101	26 50 33.3	1.462	19	6 46 46.02	2.1590	25 32 27.8	4.635
20	5 3 30.71	2.2106	26 51 57.1	1.333	20	6 48 55.48	2.1564	25 27 46.1	4.755
21	5 5 43.36	2.2111	26 53 13.2	1.203	21	6 51 4.79	2.1538	25 22 57.2	4.874
22	5 7 56.04	2.2116	26 54 21.5	1.073	22	6 53 13.94	2.1512	25 18 1.2	4.993
23	5 10 8.75	2.2119	26 55 22.0	0.943	23	6 55 22.93	2.1486	25 12 58.1	5.110
24	5 12 21.47	2.2122	N. 26 56 14.7	0.813	24	6 57 31.77	2.1459	N. 25 7 48.0	5.228

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

THURSDAY 25.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	6 57 31.77	2.1459	N. 25 7 48.0	5.228
1	6 59 40.44	2.1432	25 2 30.8	5.344
2	7 1 48.95	2.1405	24 57 6.7	5.460
3	7 3 57.30	2.1378	24 51 35.6	5.577
4	7 6 5.48	2.1349	24 45 57.5	5.692
5	7 8 13.49	2.1320	24 40 12.6	5.806
6	7 10 21.32	2.1291	24 34 20.8	5.920
7	7 12 28.98	2.1263	24 28 22.2	6.033
8	7 14 36.47	2.1233	24 22 16.8	6.147
9	7 16 43.78	2.1204	24 16 4.6	6.259
10	7 18 50.92	2.1174	24 9 45.7	6.371
11	7 20 57.87	2.1143	24 3 20.1	6.483
12	7 23 4.64	2.1113	23 56 47.8	6.593
13	7 25 11.23	2.1083	23 50 8.9	6.703
14	7 27 17.64	2.1053	23 43 23.5	6.812
15	7 29 23.86	2.1022	23 36 31.5	6.921
16	7 31 29.90	2.0991	23 29 33.0	7.029
17	7 33 35.75	2.0960	23 22 28.0	7.138
18	7 35 41.42	2.0929	23 15 16.5	7.244
19	7 37 46.90	2.0898	23 7 58.7	7.350
20	7 39 52.19	2.0866	23 0 34.5	7.456
21	7 41 57.29	2.0834	22 53 4.0	7.561
22	7 44 2.20	2.0803	22 45 27.2	7.665
23	7 46 6.92	2.0772	N. 22 37 44.2	7.768

FRIDAY 26.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	7 48 11.46	2.0740	N. 22 29 55.0	7.872
1	7 50 15.80	2.0708	22 21 59.6	7.974
2	7 52 19.96	2.0677	22 13 58.1	8.076
3	7 54 23.92	2.0645	22 5 50.5	8.177
4	7 56 27.70	2.0614	21 57 36.9	8.278
5	7 58 31.29	2.0582	21 49 17.2	8.378
6	8 0 34.68	2.0550	21 40 51.6	8.476
7	8 2 37.89	2.0519	21 32 20.1	8.574
8	8 4 40.91	2.0488	21 23 42.7	8.673
9	8 6 43.74	2.0456	21 14 59.4	8.770
10	8 8 46.38	2.0425	21 6 10.3	8.866
11	8 10 48.84	2.0394	20 57 15.5	8.962
12	8 12 51.11	2.0363	20 48 14.9	9.058
13	8 14 53.19	2.0332	20 39 8.6	9.152
14	8 16 55.09	2.0302	20 29 56.7	9.245
15	8 18 56.81	2.0272	20 20 39.2	9.338
16	8 20 58.35	2.0241	20 11 16.1	9.431
17	8 22 59.70	2.0210	20 1 47.5	9.523
18	8 25 0.87	2.0180	19 52 13.4	9.613
19	8 27 1.86	2.0151	19 42 33.9	9.703
20	8 29 2.68	2.0122	19 32 49.0	9.793
21	8 31 3.32	2.0093	19 22 58.7	9.883
22	8 33 3.79	2.0063	19 13 3.1	9.971
23	8 35 4.08	2.0034	19 3 2.2	10.058
24	8 37 4.20	2.0006	N. 18 52 56.1	10.145

SATURDAY 27.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Di for 1 Mi
	h m s	s	° ′ ″	″
0	8 37 4.20	2.0006	N. 18 52 56.1	10.
1	8 39 4.15	1.9978	18 42 44.8	10.
2	8 41 3.94	1.9951	18 32 28.4	10.
3	8 43 3.56	1.9923	18 22 6.8	10.
4	8 45 3.01	1.9895	18 11 40.2	10.
5	8 47 2.30	1.9868	18 1 8.5	10.
6	8 49 1.43	1.9842	17 50 31.8	10.
7	8 51 0.40	1.9816	17 39 50.2	10.
8	8 52 59.22	1.9790	17 29 3.7	10.
9	8 54 57.88	1.9764	17 18 12.4	10.
10	8 56 56.39	1.9739	17 7 16.2	10.
11	8 58 54.75	1.9714	16 56 15.2	11.
12	9 0 52.96	1.9690	16 45 9.5	11.
13	9 2 51.03	1.9666	16 33 59.1	11.
14	9 4 48.95	1.9642	16 22 44.1	11.
15	9 6 46.73	1.9619	16 11 24.4	11.
16	9 8 44.38	1.9597	16 0 0.1	11.
17	9 10 41.90	1.9575	15 48 31.3	11.
18	9 12 39.28	1.9553	15 36 58.0	11.
19	9 14 36.54	1.9533	15 25 20.3	11.
20	9 16 33.67	1.9511	15 13 38.2	11.
21	9 18 30.67	1.9491	15 1 51.7	11.
22	9 20 27.56	1.9472	14 50 0.8	11.
23	9 22 24.33	1.9453	N. 14 38 5.7	11.

SUNDAY 28.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Di for 1 Mi
0	9 24 20.99	1.9433	N. 14 26 6.4	12.
1	9 26 17.53	1.9415	14 14 2.8	12.
2	9 28 13.97	1.9398	14 1 55.1	12.
3	9 30 10.31	1.9381	13 49 43.3	12.
4	9 32 6.54	1.9363	13 37 27.4	12.
5	9 34 2.67	1.9348	13 25 7.4	12.3
6	9 35 58.71	1.9333	13 12 43.5	12.4
7	9 37 54.66	1.9318	13 0 15.6	12.4
8	9 39 50.52	1.9303	12 47 43.8	12.5
9	9 41 46.29	1.9289	12 35 8.1	12.6
10	9 43 41.99	1.9277	12 22 28.6	12.6
11	9 45 37.61	1.9264	12 9 45.3	12.7
12	9 47 33.16	1.9252	11 56 58.3	12.8
13	9 49 28.63	1.9240	11 44 7.6	12.8
14	9 51 24.04	1.9230	11 31 13.2	12.9
15	9 53 19.39	1.9220	11 18 15.2	12.9
16	9 55 14.68	1.9210	11 5 13.6	13.0
17	9 57 9.91	1.9201	10 52 8.5	13.1
18	9 59 5.09	1.9193	10 38 59.9	13.1
19	10 1 0.23	1.9186	10 25 47.9	13.2
20	10 2 55.32	1.9178	10 12 32.4	13.2
21	10 4 50.37	1.9173	9 59 13.6	13.34
22	10 6 45.39	1.9168	9 45 51.5	13.39
23	10 8 40.38	1.9163	9 32 26.1	13.4
24	10 10 35.34	1.9158	N. 9 18 57.4	13.50

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

r. Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
MONDAY 29.			
h m s	s	° ′ ″	″
10 10 35.34	1.9158	N. 9 18 57.4	13.504
10 12 30.27	1.9154	9 5 25.6	13.557
10 14 25.19	1.9152	8 51 50.6	13.609
10 16 20.09	1.9149	8 38 12.5	13.660
10 18 14.98	1.9148	8 24 31.4	13.711
10 20 9.87	1.9147	8 10 47.2	13.761
10 22 4.75	1.9148	7 57 0.1	13.809
10 23 59.64	1.9149	7 43 10.1	13.858
10 25 54.54	1.9151	7 29 17.2	13.906
10 27 49.45	1.9153	7 15 21.4	13.953
10 29 44.37	1.9155	7 1 22.9	13.998
10 31 39.31	1.9159	6 47 21.6	14.044
10 33 34.28	1.9164	6 33 17.6	14.088
10 35 29.28	1.9169	6 19 11.0	14.132
10 37 24.31	1.9175	6 5 1.8	14.175
10 39 19.38	1.9182	5 50 50.0	14.218
10 41 14.49	1.9189	5 36 35.7	14.258
10 43 9.65	1.9198	5 22 19.0	14.299
10 45 4.87	1.9208	5 7 59.8	14.339
10 47 0.15	1.9218	4 53 38.3	14.378
10 48 55.48	1.9228	4 39 14.5	14.416
10 50 50.88	1.9240	4 24 48.4	14.453
10 52 46.36	1.9253	4 10 20.1	14.490
10 54 41.91	1.9265	N. 3 55 49.6	14.526
TUESDAY 30.			
10 56 37.54	1.9279	N. 3 41 17.0	14.561
10 58 33.26	1.9294	3 26 42.3	14.595
11 0 29.07	1.9309	3 12 5.6	14.628
11 2 24.97	1.9326	2 57 27.0	14.659
11 4 20.98	1.9344	2 42 46.5	14.691
11 6 17.10	1.9363	2 28 4.1	14.722
11 8 13.33	1.9381	2 13 19.9	14.752
11 10 9.67	1.9400	1 58 33.9	14.781
11 12 6.13	1.9421	1 43 46.2	14.808
11 14 2.72	1.9443	1 28 56.9	14.835
11 15 59.45	1.9466	1 14 6.0	14.861
11 17 56.31	1.9488	0 59 13.6	14.885
11 19 53.31	1.9513	0 44 19.8	14.909
11 21 50.46	1.9538	0 29 24.5	14.933
11 23 47.76	1.9563	N. 0 14 27.9	14.955
11 25 45.22	1.9591	S. 0 0 30.1	14.977
11 27 42.85	1.9619	0 15 29.3	14.996
11 29 40.65	1.9648	0 30 29.6	15.015
11 31 38.62	1.9677	0 45 31.1	15.034
11 33 36.77	1.9707	1 0 33.7	15.051
11 35 35.10	1.9738	1 15 37.2	15.067
11 37 33.63	1.9771	1 30 41.7	15.083
11 39 32.35	1.9803	1 45 47.1	15.096
11 41 31.27	1.9838	2 0 53.2	15.108
11 43 30.40	1.9873	S. 2 16 0.1	15.120

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
WEDNESDAY, DECEMBER 1.				
	h m s	s	° ′ ″	″
0	11 43 30.40	1.9873	S. 2 16 0.1	15.120

PHASES OF THE MOON.

			d	h	m
●	New Moon	Nov.	6	19	52.3
☽	First Quarter		13	11	3.0
○	Full Moon		21	5	36.4
☾	Last Quarter		29	10	10.5

			d	h
☾	Perigee	Nov.	8	2.3
☾	Apogee		23	11.7

AT GREENWICH APPARENT NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Semidiameter.	Sidereal Time of Semidiameter Passing Meridian.	Equation of Time, to be Subtracted from / Added to Apparent Time.
		h m s	s	° ′ ″	″	′ ″	s	m s
Wed.	1	16 25 48.24	10.776	S.21 41 13.5	−24.19	16 15.20	70.18	11 12.79
Thur.	2	16 30 7.20	10.804	21 50 41.6	23.15	16 15.35	70.26	10 50.44
Fri.	3	16 34 26.83	10.831	21 59 44.6	22.10	16 15.50	70.35	10 27.44
Sat.	4	16 38 47.09	10.857	22 8 22.2	−21.03	16 15.64	70.43	10 3.80
SUN.	5	16 43 7.96	10.882	22 16 34.1	19.95	16 15.78	70.51	9 39.55
Mon.	6	16 47 29.42	10.905	22 24 20.0	18.87	16 15.92	70.59	9 14.72
Tues.	7	16 51 51.42	10.927	22 31 39.7	−17.77	16 16.05	70.66	8 49.35
Wed.	8	16 56 13.94	10.948	22 38 32.9	16.66	16 16.18	70.73	8 23.46
Thur.	9	17 0 36.94	10.968	22 44 59.4	15.54	16 16.31	70.80	7 57.09
Fri.	10	17 5 0.40	10.986	22 50 59.0	−14.42	16 16.43	70.86	7 30.26
Sat.	11	17 9 24.28	11.003	22 56 31.6	13.29	16 16.55	70.92	7 3.02
SUN.	12	17 13 48.54	11.018	23 1 36.9	12.15	16 16.66	70.97	6 35.38
Mon.	13	17 18 13.16	11.032	23 6 14.8	−11.01	16 16.77	71.02	6 7.40
Tues.	14	17 22 38.11	11.045	23 10 25.1	9.86	16 16.88	71.06	5 39.09
Wed.	15	17 27 3.35	11.057	23 14 7.8	8.70	16 16.99	71.10	5 10.49
Thur.	16	17 31 28.85	11.067	23 17 22.7	− 7.54	16 17.09	71.13	4 41.63
Fri.	17	17 35 54.58	11.076	23 20 9.7	6.37	16 17.18	71.16	4 12.53
Sat.	18	17 40 20.52	11.084	23 22 28.7	5.21	16 17.27	71.18	3 43.23
SUN.	19	17 44 46.64	11.091	23 24 19.6	− 4.04	16 17.35	71.21	3 13.76
Mon.	20	17 49 12.89	11.096	23 25 42.4	2.86	16 17.42	71.23	2 44.14
Tues.	21	17 53 39.25	11.100	23 26 37.0	1.69	16 17.48	71.25	2 14.42
Wed.	22	17 58 5.70	11.103	23 27 3.4	− 0.51	16 17.54	71.26	1 44.61
Thur.	23	18 2 32.20	11.104	23 27 1.4	+ 0.67	16 17.60	71.26	1 14.76
Fri.	24	18 6 58.71	11.104	23 26 31.3	1.85	16 17.65	71.26	0 44.88
Sat.	25	18 11 25.21	11.103	23 25 32.8	+ 3.02	16 17.69	71.25	0 15.02
SUN.	26	18 15 51.67	11.101	23 24 6.1	4.20	16 17.73	71.24	0 14.79
Mon.	27	18 20 18.05	11.097	23 22 11.1	5.38	16 17.76	71.23	0 44.54
Tues.	28	18 24 44.33	11.092	23 19 47.9	+ 6.55	16 17.79	71.21	1 14.17
Wed.	29	18 29 10.47	11.086	23 16 56.6	7.72	16 17.81	71.19	1 43.67
Thur.	30	18 33 36.44	11.078	23 13 37.2	8.89	16 17.82	71.16	2 13.00
Fri.	31	18 38 2.20	11.068	23 9 49.7	10.06	16 17.83	71.13	2 42.12
Sat.	32	18 42 27.72	11.057	S.23 5 34.4	+11.22	16 17.84	71.09	3 11.01

Note.—The mean time of semidiameter passing the meridian may be found by subtracting $0^{s}.19$ from the sider time.

The sign − prefixed to the hourly change of declination indicates that south declinations are increasing; sign + indicates that south declinations are decreasing.

AT GREENWICH MEAN NOON.

Day of the Week.	Day of the Month.	THE SUN'S Apparent Right Ascension.	THE SUN'S Diff. for 1 Hour.	THE SUN'S Apparent Declination.	THE SUN'S Diff. for 1 Hour.	Equation of Time, to be Added to / Subtracted from Mean Time.	Diff. for 1 Hour.	Sidereal Time, or Right Ascension of Mean Sun.
		h m s	s	° ′ ″	″	m s	s	h m s
Wed.	1	16 25 50.25	10.773	S. 21 41 18.0	−24.18	11 12.62	0.917	16 37 2.87
Thur.	2	16 30 9.16	10.801	21 50 45.8	23.14	10 50.27	0.945	16 40 59.43
Fri.	3	16 34 28.72	10.828	21 59 48.5	22.09	10 27.27	0.972	16 44 55.98
Sat.	4	16 38 48.91	10.854	22 8 25.7	−21.02	10 3.63	0.998	16 48 52.54
SUN.	5	16 43 9.71	10.879	22 16 37.3	19.94	9 39.39	1.022	16 52 49.10
Mon.	6	16 47 31.10	10.902	22 24 22.9	18.85	9 14.56	1.046	16 56 45.66
Tues.	7	16 51 53.02	10.924	22 31 42.3	−17.75	8 49.20	1.068	17 0 42.22
Wed.	8	16 56 15.47	10.945	22 38 35.2	16.65	8 23.31	1.089	17 4 38.78
Thur.	9	17 0 38.40	10.965	22 45 1.4	15.54	7 56.94	1.108	17 8 35.34
Fri.	10	17 5 1.78	10.983	22 51 0.8	−14.41	7 30.12	1.126	17 12 31.89
Sat.	11	17 9 25.57	11.000	22 56 33.1	13.28	7 2.88	1.143	17 16 28.45
SUN.	12	17 13 49.75	11.015	23 1 38.2	12.14	6 35.26	1.158	17 20 25.01
Mon.	13	17 18 14.29	11.029	23 6 15.9	−11.00	6 7.28	1.172	17 24 21.57
Tues.	14	17 22 39.15	11.042	23 10 26.0	9.85	5 38.98	1.185	17 28 18.13
Wed.	15	17 27 4.30	11.053	23 14 8.6	8.69	5 10.39	1.197	17 32 14.69
Thur.	16	17 31 29.71	11.063	23 17 23.3	− 7.53	4 41.53	1.207	17 36 11.25
Fri.	17	17 35 55.36	11.073	23 20 10.1	6.37	4 12.44	1.216	17 40 7.80
Sat.	18	17 40 21.21	11.081	23 22 29.0	5.20	3 43.15	1.224	17 44 4.36
SUN.	19	17 44 47.23	11.087	23 24 19.8	− 4.03	3 13.69	1.231	17 48 0.92
Mon.	20	17 49 13.39	11.092	23 25 42.5	2.86	2 44.09	1.236	17 51 57.48
Tues.	21	17 53 39.67	11.096	23 26 37.0	1.68	2 14.37	1.240	17 55 54.04
Wed.	22	17 58 6.02	11.099	23 27 3.4	− 0.51	1 44.58	1.243	17 59 50.60
Thur.	23	18 2 32.43	11.101	23 27 1.4	+ 0.67	1 14.73	1.244	18 3 47.16
Fri.	24	18 6 58.85	11.101	23 26 31.2	1.85	0 44.87	1.244	18 7 43.72
Sat.	25	18 11 25.26	11.099	23 25 32.8	+ 3.02	0 15.02	1.243	18 11 40.28
SUN.	26	18 15 51.62	11.097	23 24 6.1	4.20	0 14.79	1.240	18 15 36.84
Mon.	27	18 20 17.92	11.093	23 22 11.2	5.38	0 44.52	1.237	18 19 33.39
Tues.	28	18 24 44.10	11.088	23 19 48.0	+ 6.55	1 14.15	1.232	18 23 29.95
Wed.	29	18 29 10.15	11.082	23 16 56.8	7.72	1 43.64	1.225	18 27 26.51
Thur.	30	18 33 36.03	11.074	23 13 37.5	8.89	2 12.96	1.217	18 31 23.07
Fri.	31	18 38 1.70	11.065	23 9 50.2	10.05	2 42.07	1.208	18 35 19.63
Sat.	32	18 42 27.14	11.054	S. 23 5 35.0	+11.21	3 10.95	1.198	18 39 16.19

NOTE.—The semidiameter for mean noon may be assumed the same as that for apparent noon. The sign − prefixed to the hourly change of declination indicates that south declinations are increasing; the sign + indicates that south declinations are decreasing.

Diff. for 1 Hour,
+9s.8565.
(Table III.)

AT GREENWICH MEAN NOON.

Day of the Month.	Day of the Year.	THE SUN'S True Longitude. λ	THE SUN'S True Longitude. λ′	THE SUN'S Diff. for 1 Hour.	THE SUN'S Latitude.	Logarithm of the Radius Vector of the Earth.	Diff. for 1 Hour.	Mean Time of Sidereal Noon.
		° ′ ″	′ ″	″	″			h m s
1	335	248 13 14.8	12 17.0	152.09	−0.50	9.993 8554	−28.0	7 21 44.5
2	336	249 14 5.8	13 7.9	152.15	0.56	9.993 7892	27.3	7 17 48.6
3	337	250 14 58.3	14 0.2	152.21	0.60	9.993 7244	26.7	7 13 52.7
4	338	251 15 52.0	14 53.7	152.27	−0.61	9.993 6611	−26.1	7 9 56.8
5	339	252 16 47.1	15 48.6	152.32	0.59	9.993 5992	25.5	7 6 0.9
6	340	253 17 43.2	16 44.5	152.36	0.53	9.993 5386	25.0	7 2 5.0
7	341	254 18 40.4	17 41.6	152.40	−0.45	9.993 4792	−24.5	6 58 9.0
8	342	255 19 38.5	18 39.5	152.44	0.34	9.993 4211	23.9	6 54 13.1
9	343	256 20 37.5	19 38.2	152.47	0.22	9.993 3644	23.3	6 50 17.2
10	344	257 21 37.2	20 37.7	152.50	−0.08	9.993 3092	−22.7	6 46 21.3
11	345	258 22 37.4	21 37.8	152.52	+0.06	9.993 2556	22.0	6 42 25.4
12	346	259 23 38.3	22 38.4	152.55	0.19	9.993 2038	21.2	6 38 29.5
13	347	260 24 39.6	23 39.6	152.57	+0.31	9.993 1539	−20.3	6 34 33.
14	348	261 25 41.4	24 41.2	152.59	0.41	9.993 1061	19.4	6 30 37.7
15	349	262 26 43.7	25 43.3	152.60	0.48	9.993 0606	18.4	6 26 41.7
16	350	263 27 46.4	26 45.8	152.62	+0.53	9.993 0174	−17.4	6 22 45.
17	351	264 28 49.6	27 48.8	152.64	0.55	9.992 9768	16.4	6 18 49.9
18	352	265 29 53.3	28 52.3	152.66	0.53	9.992 9386	15.3	6 14 54.0
19	353	266 30 57.3	29 56.2	152.68	+0.49	9.992 9031	−14.2	6 10 58.14
20	354	267 32 1.9	31 0.5	152.70	0.43	9.992 8703	13.1	6 7 2.22
21	355	268 33 6.9	32 5.3	152.72	0.35	9.992 8401	12.0	6 3 6.31
22	356	269 34 12.4	33 10.6	152.74	+0.25	9.992 8128	−10.8	5 59 10.40
23	357	270 35 18.4	34 16.4	152.76	+0.13	9.992 7882	9.7	5 55 14.48
24	358	271 36 24.8	35 22.6	152.78	0.00	9.992 7662	8.6	5 51 18.57
25	359	272 37 31.8	36 29.5	152.80	−0.13	9.992 7469	− 7.5	5 47 22.66
26	360	273 38 39.4	37 36.8	152.83	0.25	9.992 7303	6.4	5 43 26.75
27	361	274 39 47.4	38 44.6	152.85	0.36	9.992 7164	5.3	5 39 30.83
28	362	275 40 56.0	39 53.0	152.87	−0.46	9.992 7048	− 4.3	5 35 34.92
29	363	276 42 5.0	41 1.9	152.89	0.53	9.992 6957	3.3	5 31 39.01
30	364	277 43 14.6	42 11.3	152.91	0.58	9.992 6888	2.4	5 27 43.09
31	365	278 44 24.6	43 21.1	152.93	0.60	9.992 6840	1.6	5 23 47.18
32	366	279 45 35.0	44 31.3	152.94	−0.58	9.992 6812	− 0.8	5 19 51.27

NOTE.—The longitudes in the column λ are referred to the true equinox of their own date, while those in the column λ′ are referred to the mean equinox of the beginning of the Besselian fictitious year.

Diff. for 1 Hour,
−9ˢ.8296.
(Table II.)

GREENWICH MEAN TIME.

Day of the Month.	THE MOON'S								
	SEMIDIAMETER.		HORIZONTAL PARALLAX.				UPPER TRANSIT.		AGE.
	Noon.	Midnight.	Noon.	Diff. for 1 Hour.	Midnight.	Diff. for 1 Hour.	Meridian of Greenwich.	Diff. for 1 Hour.	Noon.
	′ ″	′ ″	′ ″	″	′ ″	″	h m	m	d
1	15 43.5	15 51.4	57 36.77	+2.383	58 5.73	+2.437	19 43.2	1.98	24.2
2	15 59.4	16 7.3	58 35.08	2.446	59 4.23	2.402	20 32.5	2.15	25.2
3	16 15.0	16 22.3	59 32.49	2.298	59 59.14	2.134	21 26.6	2.37	26.2
4	16 28.9	16 34.7	60 23.45	+1.907	60 44.67	+1.619	22 26.3	2.60	27.2
5	16 39.4	16 43.0	61 2.10	1.277	61 15.16	0.893	23 31.1	2.77	28.2
6	16 45.2	16 46.1	61 23.41	+0.478	61 26.56	+0.045	6	. .	29.2
7	16 45.5	16 43.6	61 24.48	−0.389	61 17.29	−0.804	0 38.6	2.81	0.7
8	16 40.3	16 35.9	61 5.32	1.185	60 49.03	1.521	1 45.0	2.70	1.7
9	16 30.4	16 24.1	60 29.02	1.805	60 5.95	2.030	2 47.3	2.48	2.7
0	16 17.2	16 9.9	59 40.55	−2.193	59 13.56	−2.296	3 43.9	2.24	3.7
1	16 2.3	15 54.6	58 45.66	2.345	58 17.49	2.343	4 35.1	2.04	4.7
2	15 47.0	15 39.6	57 49.61	2.298	57 22.49	2.217	5 22.1	1.90	5.7
3	15 32.5	15 25.8	56 56.51	−2.108	56 31.98	−1.978	6 6.5	1.81	6.7
4	15 19.6	15 13.9	56 9.11	1.832	55 48.05	1.676	6 49.6	1.78	7.7
5	15 8.6	15 4.0	55 28.91	1.514	55 11.73	1.350	7 32.6	1.81	8.7
16	14 59.8	14 56.2	54 56.50	−1.189	54 43.17	−1.033	8 16.6	1.86	9.7
17	14 53.0	14 50.4	54 31.69	0.881	54 22.00	0.734	9 2.2	1.95	10.7
18	14 48.2	14 46.5	54 14.03	0.596	54 7.66	0.467	9 50.0	2.03	11.7
19	14 45.2	14 44.2	54 2.79	−0.345	53 59.37	−0.227	10 39.6	2.09	12.7
20	14 43.7	14 43.5	53 57.33	−0.114	53 56.61	−0.007	11 30.3	2.12	13.7
21	14 43.6	14 44.1	53 57.15	+0.097	53 58.94	+0.202	12 21.0	2.10	14.7
22	14 45.0	14 46.1	54 2.00	+0.308	54 6.34	+0.415	13 10.6	2.03	15.7
23	14 47.7	14 49.6	54 11.97	0.524	54 18.94	0.639	13 58.4	1.95	16.7
24	14 51.9	14 54.6	54 27.32	0.759	54 37.18	0.886	14 44.1	1.86	17.7
25	14 57.7	15 1.2	54 48.60	+1.018	55 1.64	+1.156	15 27.9	1.80	18.7
26	15 5.2	15 9.7	55 16.36	1.298	55 32.79	1.441	16 10.6	1.77	19.7
27	15 14.6	15 20.1	55 50.95	1.585	56 10.83	1.727	16 53.1	1.79	20.7
28	15 25.9	15 32.2	56 32.38	+1.862	56 55.48	+1.985	17 36.7	1.86	21.7
29	15 38.9	15 45.9	57 19.95	2.090	57 45.54	2.171	18 22.6	1.99	22.7
30	15 53.1	16 0.4	58 11.93	2.222	58 38.72	2.236	19 12.4	2.18	23.7
31	16 7.6	16 14.7	59 5.43	2.206	59 31.47	2.125	20 7.3	2.40	24.7
32	16 21.5	16 27.7	59 56.21	+1.989	60 18.98	+1.795	21 7.7	2.63	25.7

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

WEDNESDAY 1.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	11 43 30.40	1.9873	S. 2 16 0.1	15.120
1	11 45 29.74	1.9908	2 31 7.6	15.131
2	11 47 29.30	1.9945	2 46 15.8	15.141
3	11 49 29.08	1.9983	3 1 24.5	15.149
4	11 51 29.09	2.0021	3 16 33.7	15.157
5	11 53 29.33	2.0061	3 31 43.3	15.163
6	11 55 29.82	2.0102	3 46 53.3	15.168
7	11 57 30.55	2.0143	4 2 3.5	15.172
8	11 59 31.53	2.0184	4 17 13.9	15.174
9	12 1 32.76	2.0228	4 32 24.4	15.175
10	12 3 34.26	2.0273	4 47 34.9	15.175
11	12 5 36.03	2.0318	5 2 45.4	15.175
12	12 7 38.07	2.0363	5 17 55.9	15.173
13	12 9 40.39	2.0410	5 33 6.2	15.169
14	12 11 42.99	2.0458	5 48 16.2	15.164
15	12 13 45.88	2.0507	6 3 25.9	15.158
16	12 15 49.07	2.0557	6 18 35.1	15.150
17	12 17 52.56	2.0608	6 33 43.9	15.142
18	12 19 56.36	2.0659	6 48 52.1	15.131
19	12 22 0.47	2.0711	7 3 59.6	15.119
20	12 24 4.89	2.0764	7 19 6.4	15.107
21	12 26 9.64	2.0819	7 34 12.4	15.093
22	12 28 14.72	2.0874	7 49 17.5	15.077
23	12 30 20.13	2.0931	S. 8 4 21.6	15.059

THURSDAY 2.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	12 32 25.89	2.0988	S. 8 19 24.6	15.040
1	12 34 31.99	2.1046	8 34 26.4	15.020
2	12 36 38.44	2.1105	8 49 27.0	14.998
3	12 38 45.25	2.1165	9 4 26.2	14.975
4	12 40 52.42	2.1226	9 19 24.0	14.951
5	12 42 59.96	2.1288	9 34 20.3	14.924
6	12 45 7.87	2.1350	9 49 14.9	14.895
7	12 47 16.16	2.1414	10 4 7.7	14.866
8	12 49 24.84	2.1478	10 18 58.8	14.836
9	12 51 33.90	2.1543	10 33 48.0	14.803
10	12 53 43.35	2.1609	10 48 35.1	14.768
11	12 55 53.21	2.1677	11 3 20.1	14.732
12	12 58 3.47	2.1744	11 18 2.9	14.694
13	13 0 14.14	2.1813	11 32 43.4	14.654
14	13 2 25.22	2.1883	11 47 21.4	14.613
15	13 4 36.73	2.1953	12 1 56.9	14.570
16	13 6 48.66	2.2024	12 16 29.8	14.525
17	13 9 1.02	2.2097	12 30 59.9	14.478
18	13 11 13.82	2.2169	12 45 27.2	14.430
19	13 13 27.05	2.2243	12 59 51.5	14.380
20	13 15 40.73	2.2318	13 14 12.8	14.328
21	13 17 54.86	2.2393	13 28 30.9	14.274
22	13 20 9.45	2.2469	13 42 45.7	14.218
23	13 22 24.49	2.2546	13 56 57.1	14.161
24	13 24 40.00	2.2623	S. 14 11 5.0	14.102

FRIDAY 3.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	13 24 40.00	2.2623	S. 14 11 5.0	14.10
1	13 26 55.97	2.2701	14 25 9.3	14.04
2	13 29 12.41	2.2780	14 39 9.8	13.97
3	13 31 29.33	2.2860	14 53 6.4	13.91
4	13 33 46.73	2.2940	15 6 59.0	13.84
5	13 36 4.61	2.3021	15 20 47.5	13.77
6	13 38 22.98	2.3103	15 34 31.8	13.70
7	13 40 41.84	2.3185	15 48 11.7	13.62
8	13 43 1.20	2.3268	16 1 47.1	13.55
9	13 45 21.05	2.3350	16 15 17.9	13.47
10	13 47 41.40	2.3434	16 28 44.0	13.39
11	13 50 2.26	2.3519	16 42 5.2	13.31
12	13 52 23.63	2.3603	16 55 21.5	13.23
13	13 54 45.50	2.3688	17 8 32.7	13.14
14	13 57 7.89	2.3775	17 21 38.6	13.05
15	13 59 30.80	2.3861	17 34 39.2	12.96
16	14 1 54.22	2.3948	17 47 34.2	12.87
17	14 4 18.17	2.4035	18 0 23.6	12.77
18	14 6 42.64	2.4122	18 13 7.2	12.67
19	14 9 7.63	2.4209	18 25 45.0	12.57
20	14 11 33.15	2.4298	18 38 16.7	12.47
21	14 13 59.20	2.4385	18 50 42.3	12.37
22	14 16 25.77	2.4473	19 3 1.6	12.26
23	14 18 52.88	2.4563	S. 19 15 14.4	12.15

SATURDAY 4.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	14 21 20.52	2.4651	S. 19 27 20.6	12.04
1	14 23 48.69	2.4739	19 39 20.2	11.93
2	14 26 17.39	2.4828	19 51 12.9	11.82
3	14 28 46.63	2.4918	20 2 58.7	11.70
4	14 31 16.40	2.5006	20 14 37.3	11.58
5	14 33 46.70	2.5095	20 26 8.7	11.46
6	14 36 17.54	2.5184	20 37 32.7	11.33
7	14 38 48.91	2.5273	20 48 49.1	11.21
8	14 41 20.81	2.5361	20 59 57.9	11.08
9	14 43 53.24	2.5448	21 10 58.9	10.95
10	14 46 26.19	2.5537	21 21 51.9	10.81
11	14 48 59.68	2.5625	21 32 36.8	10.68
12	14 51 33.69	2.5713	21 43 13.6	10.54
13	14 54 8.23	2.5799	21 53 42.1	10.40
14	14 56 43.28	2.5886	22 4 2.0	10.26
15	14 59 18.86	2.5973	22 14 13.3	10.11
16	15 1 54.95	2.6058	22 24 15.9	9.965
17	15 4 31.55	2.6143	22 34 9.5	9.815
18	15 7 8.66	2.6227	22 43 54.1	9.665
19	15 9 46.27	2.6310	22 53 29.6	9.514
20	15 12 24.38	2.6393	23 2 55.8	9.358
21	15 15 2.99	2.6476	23 12 12.5	9.199
22	15 17 42.09	2.6558	23 21 19.7	9.039
23	15 20 21.68	2.6638	23 30 17.2	8.877
24	15 23 1.74	2.6717	S. 23 39 4.9	8.713

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SUNDAY 5.					TUESDAY 7.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	15 23 1.74	2.6717	S. 23 39 4.9	8.713	0	17 37 33.25	2.8563	S. 26 55 48.3	0.932
1	15 25 42.28	2.6797	23 47 42.7	8.546	1	17 40 24.58	2.8547	26 54 45.9	1.148
2	15 28 23.30	2.6875	23 56 10.4	8.377	2	17 43 15.81	2.8528	26 53 30.6	1.363
3	15 31 4.78	2.6951	24 4 27.9	8.206	3	17 46 6.92	2.8508	26 52 2.4	1.578
4	15 33 46.71	2.7026	24 12 35.1	8.033	4	17 48 57.90	2.8485	26 50 21.3	1.792
5	15 36 29.09	2.7100	24 20 31.9	7.858	5	17 51 48.74	2.8460	26 48 27.4	2.005
6	15 39 11.91	2.7173	24 28 18.1	7.682	6	17 54 39.42	2.8432	26 46 20.7	2.218
7	15 41 55.17	2.7246	24 35 53.7	7.503	7	17 57 29.92	2.8402	26 44 1.3	2.429
8	15 44 38.86	2.7316	24 43 18.5	7.323	8	18 0 20.24	2.8370	26 41 29.2	2.641
9	15 47 22.96	2.7384	24 50 32.4	7.140	9	18 3 10.36	2.8335	26 38 44.4	2.851
10	15 50 7.47	2.7453	24 57 35.3	6.956	10	18 6 0.26	2.8298	26 35 47.1	3.060
11	15 52 52.39	2.7519	25 4 27.1	6.770	11	18 8 49.94	2.8261	26 32 37.2	3.268
12	15 55 37.70	2.7583	25 11 7.7	6.582	12	18 11 39.39	2.8220	26 29 14.9	3.476
13	15 58 23.39	2.7647	25 17 36.9	6.392	13	18 14 28.58	2.8176	26 25 40.1	3.683
14	16 1 9.46	2.7708	25 23 54.7	6.201	14	18 17 17.50	2.8131	26 21 53.0	3.887
15	16 3 55.89	2.7768	25 30 1.0	6.008	15	18 20 6.15	2.8084	26 17 53.7	4.091
16	16 6 42.67	2.7825	25 35 55.7	5.813	16	18 22 54.51	2.8035	26 13 42.1	4.294
17	16 9 29.79	2.7882	25 41 38.6	5.617	17	18 25 42.57	2.7983	26 9 18.4	4.495
18	16 12 17.25	2.7937	25 47 9.7	5.419	18	18 28 30.31	2.7930	26 4 42.7	4.694
19	16 15 5.03	2.7988	25 52 28.9	5.220	19	18 31 17.73	2.7876	25 59 55.1	4.893
20	16 17 53.11	2.8039	25 57 36.1	5.020	20	18 34 4.82	2.7820	25 54 55.6	5.090
21	16 20 41.50	2.8088	26 2 31.3	4.819	21	18 36 51.57	2.7762	25 49 44.3	5.286
22	16 23 30.17	2.8135	26 7 14.4	4.616	22	18 39 37.96	2.7701	25 44 21.3	5.480
23	16 26 19.12	2.8180	S. 26 11 45.2	4.411	23	18 42 23.98	2.7639	S. 25 38 46.7	5.673
	MONDAY 6.					WEDNESDAY 8.			
0	16 29 8.33	2.8223	S. 26 16 3.7	4.205	0	18 45 9.63	2.7576	S. 25 33 0.6	5.863
1	16 31 57.79	2.8263	26 20 9.8	3.998	1	18 47 54.89	2.7510	25 27 3.2	6.052
2	16 34 47.49	2.8303	26 24 3.5	3.790	2	18 50 39.75	2.7443	25 20 54.4	6.240
3	16 37 37.42	2.8339	26 27 44.6	3.581	3	18 53 24.20	2.7374	25 14 34.4	6.425
4	16 40 27.56	2.8373	26 31 13.2	3.372	4	18 56 8.24	2.7305	25 8 3.4	6.608
5	16 43 17.89	2.8403	26 34 29.2	3.161	5	18 58 51.86	2.7234	25 1 21.4	6.790
6	16 46 8.40	2.8433	26 37 32.5	2.949	6	19 1 35.05	2.7162	24 54 28.6	6.970
7	16 48 59.09	2.8461	26 40 23.1	2.738	7	19 4 17.80	2.7088	24 47 25.0	7.148
8	16 51 49.93	2.8486	26 43 1.0	2.524	8	19 7 0.11	2.7013	24 40 10.8	7.325
9	16 54 40.92	2.8509	26 45 26.0	2.310	9	19 9 41.96	2.6937	24 32 46.0	7.500
10	16 57 32.04	2.8529	26 47 38.2	2.097	10	19 12 23.35	2.6860	24 25 10.8	7.673
11	17 0 23.27	2.8548	26 49 37.6	1.882	11	19 15 4.28	2.6782	24 17 25.3	7.843
12	17 3 14.61	2.8563	26 51 24.0	1.666	12	19 17 44.73	2.6702	24 9 29.7	8.011
13	17 6 6.03	2.8576	26 52 57.5	1.450	13	19 20 24.70	2.6622	24 1 24.0	8.178
14	17 8 57.52	2.8586	26 54 18.0	1.233	14	19 23 4.19	2.6540	23 53 8.4	8.341
15	17 11 49.06	2.8594	26 55 25.5	1.018	15	19 25 43.18	2.6458	23 44 43.1	8.503
16	17 14 40.65	2.8601	26 56 20.1	0.802	16	19 28 21.68	2.6375	23 36 8.1	8.663
17	17 17 32.27	2.8605	26 57 1.7	0.584	17	19 30 59.68	2.6292	23 27 23.5	8.822
18	17 20 23.91	2.8607	26 57 30.2	0.367	18	19 33 37.18	2.6208	23 18 29.5	8.978
19	17 23 15.55	2.8605	26 57 45.7	−0.150	19	19 36 14.17	2.6122	23 9 26.2	9.131
20	17 26 7.17	2.8602	26 57 48.2	+0.067	20	19 38 50.64	2.6036	23 0 13.8	9.283
21	17 28 58.77	2.8597	26 57 37.7	0.283	21	19 41 26.60	2.5950	22 50 52.3	9.433
22	17 31 50.33	2.8588	26 57 14.2	0.500	22	19 44 2.04	2.5863	22 41 21.9	9.579
23	17 34 41.83	2.8577	26 56 37.7	0.716	23	19 46 36.95	2.5774	22 31 42.8	9.724
24	17 37 33.25	2.8563	S. 26 55 48.3	0.932	24	19 49 11.33	2.5687	S. 22 21 55.0	9.868

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 9.			
	h m s	s	° ′ ″	″
0	19 49 11.33	2.5687	S. 22 21 55.0	9.868
1	19 51 45.19	2.5598	22 11 58.7	10.008
2	19 54 18.51	2.5509	22 1 54.1	10.146
3	19 56 51.30	2.5421	21 51 41.2	10.283
4	19 59 23.56	2.5332	21 41 20.2	10.416
5	20 1 55.28	2.5242	21 30 51.3	10.548
6	20 4 26.46	2.5153	21 20 14.5	10.678
7	20 6 57.11	2.5063	21 9 30.0	10.805
8	20 9 27.22	2.4973	20 58 37.9	10.931
9	20 11 56.78	2.4883	20 47 38.3	11.053
10	20 14 25.81	2.4793	20 36 31.5	11.173
11	20 16 54.30	2.4703	20 25 17.5	11.293
12	20 19 22.24	2.4612	20 13 56.4	11.409
13	20 21 49.64	2.4523	20 2 28.4	11.523
14	20 24 16.51	2.4433	19 50 53.7	11.634
15	20 26 42.84	2.4343	19 39 12.3	11.745
16	20 29 8.63	2.4254	19 27 24.3	11.853
17	20 31 33.89	2.4166	19 15 30.0	11.957
18	20 33 58.62	2.4078	19 3 29.5	12.060
19	20 36 22.82	2.3988	18 51 22.8	12.162
20	20 38 46.48	2.3900	18 39 10.1	12.261
21	20 41 9.62	2.3813	18 26 51.5	12.358
22	20 43 32.23	2.3725	18 14 27.2	12.453
23	20 45 54.32	2.3638	S. 18 1 57.2	12.546
	FRIDAY 10.			
0	20 48 15.88	2.3551	S. 17 49 21.7	12.636
1	20 50 36.93	2.3465	17 36 40.9	12.724
2	20 52 57.46	2.3379	17 23 54.8	12.811
3	20 55 17.48	2.3294	17 11 3.6	12.895
4	20 57 36.99	2.3210	16 58 7.4	12.978
5	20 59 56.00	2.3127	16 45 6.3	13.058
6	21 2 14.51	2.3043	16 32 0.4	13.137
7	21 4 32.52	2.2960	16 18 49.9	13.213
8	21 6 50.03	2.2878	16 5 34.8	13.288
9	21 9 7.05	2.2796	15 52 15.4	13.360
10	21 11 23.58	2.2715	15 38 51.6	13.431
11	21 13 39.63	2.2635	15 25 23.7	13.499
12	21 15 55.20	2.2556	15 11 51.7	13.567
13	21 18 10.30	2.2478	14 58 15.7	13.632
14	21 20 24.93	2.2399	14 44 35.9	13.694
15	21 22 39.09	2.2322	14 30 52.4	13.755
16	21 24 52.79	2.2245	14 17 5.3	13.815
17	21 27 6.03	2.2169	14 3 14.6	13.873
18	21 29 18.82	2.2094	13 49 20.5	13.929
19	21 31 31.16	2.2020	13 35 23.1	13.983
20	21 33 43.06	2.1947	13 21 22.5	14.036
21	21 35 54.52	2.1874	13 7 18.8	14.087
22	21 38 5.55	2.1803	12 53 12.1	14.136
23	21 40 16.15	2.1732	12 39 2.5	14.183
24	21 42 26.33	2.1662	S. 12 24 50.1	14.228

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 11.			
	h m s	s	° ′ ″	″
0	21 42 26.33	2.1662	S. 12 24 50.1	14.228
1	21 44 36.09	2.1593	12 10 35.1	14.273
2	21 46 45.44	2.1524	11 56 17.4	14.316
3	21 48 54.38	2.1457	11 41 57.2	14.356
4	21 51 2.92	2.1390	11 27 34.7	14.395
5	21 53 11.06	2.1324	11 13 9.8	14.433
6	21 55 18.81	2.1260	10 58 42.7	14.469
7	21 57 26.18	2.1196	10 44 13.5	14.503
8	21 59 33.16	2.1133	10 29 42.3	14.536
9	22 1 39.77	2.1071	10 15 9.2	14.568
10	22 3 46.01	2.1009	10 0 34.2	14.598
11	22 5 51.88	2.0949	9 45 57.4	14.627
12	22 7 57.40	2.0890	9 31 19.0	14.653
13	22 10 2.56	2.0831	9 16 39.0	14.679
14	22 12 7.37	2.0773	9 1 57.5	14.703
15	22 14 11.84	2.0718	8 47 14.6	14.726
16	22 16 15.98	2.0662	8 32 30.4	14.748
17	22 18 19.78	2.0607	8 17 44.9	14.768
18	22 20 23.26	2.0553	8 2 58.3	14.786
19	22 22 26.42	2.0501	7 48 10.6	14.804
20	22 24 29.27	2.0449	7 33 21.8	14.821
21	22 26 31.81	2.0398	7 18 32.1	14.835
22	22 28 34.04	2.0348	7 3 41.6	14.848
23	22 30 35.98	2.0298	S. 6 48 50.3	14.861
	SUNDAY 12.			
0	22 32 37.62	2.0250	S. 6 33 58.3	14.872
1	22 34 38.98	2.0203	6 19 5.7	14.882
2	22 36 40.06	2.0157	6 4 12.5	14.891
3	22 38 40.86	2.0112	5 49 18.8	14.898
4	22 40 41.40	2.0068	5 34 24.8	14.903
5	22 42 41.67	2.0023	5 19 30.4	14.909
6	22 44 41.68	1.9981	5 4 35.7	14.913
7	22 46 41.44	1.9939	4 49 40.9	14.915
8	22 48 40.95	1.9898	4 34 45.9	14.917
9	22 50 40.22	1.9859	4 19 50.9	14.917
10	22 52 39.26	1.9821	4 4 55.9	14.916
11	22 54 38.07	1.9783	3 50 1.0	14.914
12	22 56 36.65	1.9745	3 35 6.2	14.911
13	22 58 35.01	1.9709	3 20 11.7	14.907
14	23 0 33.16	1.9675	3 5 17.4	14.903
15	23 2 31.11	1.9640	2 50 23.4	14.896
16	23 4 28.84	1.9606	2 35 29.9	14.888
17	23 6 26.38	1.9574	2 20 36.8	14.881
18	23 8 23.73	1.9543	2 5 44.2	14.872
19	23 10 20.89	1.9512	1 50 52.2	14.861
20	23 12 17.87	1.9483	1 36 0.9	14.849
21	23 14 14.68	1.9454	1 21 10.3	14.838
22	23 16 11.32	1.9426	1 6 20.4	14.824
23	23 18 7.79	1.9399	0 51 31.4	14.810
24	23 20 4.11	1.9373	S. 0 36 43.2	14.795

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

MONDAY 13.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	23 20 4.11	1.9373	S. 0 36 43.2	14.795
1	23 22 0.27	1.9348	0 21 56.0	14.778
2	23 23 56.28	1.9323	S. 0 7 9.8	14.762
3	23 25 52.15	1.9300	N. 0 7 35.4	14.743
4	23 27 47.88	1.9278	0 22 19.4	14.724
5	23 29 43.48	1.9255	0 37 2.3	14.705
6	23 31 38.94	1.9233	0 51 44.0	14.684
7	23 33 34.28	1.9214	1 6 24.4	14.663
8	23 35 29.51	1.9196	1 21 3.5	14.640
9	23 37 24.63	1.9178	1 35 41.2	14.617
10	23 39 19.64	1.9159	1 50 17.5	14.593
11	23 41 14.54	1.9143	2 4 52.3	14.568
12	23 43 9.35	1.9128	2 19 25.6	14.542
13	23 45 4.07	1.9113	2 33 57.3	14.514
14	23 46 58.70	1.9098	2 48 27.3	14.487
15	23 48 53.25	1.9085	3 2 55.7	14.458
16	23 50 47.72	1.9072	3 17 22.3	14.428
17	23 52 42.11	1.9060	3 31 47.1	14.398
18	23 54 36.44	1.9050	3 46 10.1	14.368
19	23 56 30.71	1.9040	4 0 31.2	14.336
20	23 58 24.92	1.9031	4 14 50.4	14.303
21	0 0 19.08	1.9022	4 29 7.6	14.270
22	0 2 13.18	1.9013	4 43 22.8	14.236
23	0 4 7.24	1.9008	N. 4 57 35.9	14.201

TUESDAY 14.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	0 6 1.27	1.9002	N. 5 11 46.9	14.165
1	0 7 55.26	1.8996	5 25 55.7	14.128
2	0 9 49.22	1.8992	5 40 2.2	14.090
3	0 11 43.16	1.8988	5 54 6.5	14.053
4	0 13 37.07	1.8984	6 8 8.5	14.013
5	0 15 30.97	1.8983	6 22 8.1	13.973
6	0 17 24.86	1.8981	6 36 5.3	13.933
7	0 19 18.74	1.8979	6 50 0.1	13.892
8	0 21 12.61	1.8979	7 3 52.3	13.849
9	0 23 6.49	1.8981	7 17 42.0	13.807
10	0 25 0.38	1.8983	7 31 29.1	13.763
11	0 26 54.28	1.8984	7 45 13.6	13.718
12	0 28 48.19	1.8987	7 58 55.3	13.673
13	0 30 42.12	1.8990	8 12 34.3	13.628
14	0 32 36.07	1.8994	8 26 10.6	13.581
15	0 34 30.05	1.8999	8 39 44.0	13.533
16	0 36 24.06	1.9005	8 53 14.6	13.485
17	0 38 18.11	1.9012	9 6 42.2	13.436
18	0 40 12.20	1.9018	9 20 6.9	13.387
19	0 42 6.33	1.9026	9 33 28.6	13.336
20	0 44 0.51	1.9034	9 46 47.2	13.285
21	0 45 54.74	1.9043	10 0 2.8	13.233
22	0 47 49.03	1.9053	10 13 15.2	13.180
23	0 49 43.38	1.9063	10 26 24.4	13.127
24	0 51 37.79	1.9074	N. 10 39 30.4	13.073

WEDNESDAY 15.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	h m s	s	° ′ ″	″
0	0 51 37.79	1.9074	N. 10 39 30.4	13.073
1	0 53 32.27	1.9086	10 52 33.2	13.018
2	0 55 26.82	1.9098	11 5 32.6	12.963
3	0 57 21.44	1.9110	11 18 28.7	12.907
4	0 59 16.14	1.9124	11 31 21.4	12.849
5	1 1 10.93	1.9138	11 44 10.6	12.791
6	1 3 5.80	1.9153	11 56 56.3	12.733
7	1 5 0.76	1.9168	12 9 38.5	12.674
8	1 6 55.82	1.9184	12 22 17.2	12.614
9	1 8 50.97	1.9200	12 34 52.2	12.553
10	1 10 46.22	1.9218	12 47 23.6	12.492
11	1 12 41.58	1.9235	12 59 51.2	12.429
12	1 14 37.04	1.9253	13 12 15.1	12.367
13	1 16 32.61	1.9272	13 24 35.2	12.303
14	1 18 28.30	1.9291	13 36 51.5	12.239
15	1 20 24.10	1.9310	13 49 3.9	12.173
16	1 22 20.02	1.9330	14 1 12.3	12.108
17	1 24 16.06	1.9351	14 13 16.8	12.042
18	1 26 12.23	1.9372	14 25 17.3	11.974
19	1 28 8.52	1.9393	14 37 13.7	11.906
20	1 30 4.95	1.9416	14 49 6.0	11.838
21	1 32 1.51	1.9438	15 0 54.2	11.768
22	1 33 58.21	1.9462	15 12 38.1	11.697
23	1 35 55.05	1.9485	N. 15 24 17.8	11.627

THURSDAY 16.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
0	1 37 52.03	1.9509	N. 15 35 53.3	11.555
1	1 39 49.16	1.9533	15 47 24.4	11.483
2	1 41 46.43	1.9558	15 58 51.2	11.409
3	1 43 43.86	1.9584	16 10 13.5	11.335
4	1 45 41.44	1.9610	16 21 31.4	11.261
5	1 47 39.18	1.9636	16 32 44.8	11.186
6	1 49 37.07	1.9662	16 43 53.7	11.109
7	1 51 35.12	1.9689	16 54 57.9	11.032
8	1 53 33.34	1.9717	17 5 57.5	10.955
9	1 55 31.72	1.9744	17 16 52.5	10.877
10	1 57 30.27	1.9772	17 27 42.7	10.798
11	1 59 28.98	1.9800	17 38 28.2	10.718
12	2 1 27.87	1.9829	17 49 8.8	10.637
13	2 3 26.93	1.9858	17 59 44.6	10.556
14	2 5 26.16	1.9887	18 10 15.5	10.473
15	2 7 25.57	1.9917	18 20 41.4	10.391
16	2 9 25.16	1.9947	18 31 2.4	10.308
17	2 11 24.93	1.9977	18 41 18.3	10.223
18	2 13 24.88	2.0007	18 51 29.2	10.138
19	2 15 25.01	2.0038	19 1 34.9	10.053
20	2 17 25.33	2.0069	19 11 35.5	9.966
21	2 19 25.84	2.0100	19 21 30.8	9.878
22	2 21 26.53	2.0131	19 31 20.9	9.791
23	2 23 27.41	2.0163	19 41 5.7	9.703
24	2 25 28.48	2.0194	N. 19 50 45.2	9.613

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 17.					SUNDAY 19.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	2 25 28.48	2.0194	N. 19 50 45.2	9.613	0	4 6 5.71	2.1669	N. 25 35 48.9	4.513
1	2 27 29.74	2.0226	20 0 19.3	9.523	1	4 8 15.80	2.1693	25 40 16.1	4.393
2	2 29 31.19	2.0258	20 9 48.0	9.433	2	4 10 26.03	2.1717	25 44 36.0	4.271
3	2 31 32.84	2.0291	20 19 11.2	9.340	3	4 12 36.40	2.1739	25 48 48.6	4.149
4	2 33 34.68	2.0323	20 28 28.8	9.248	4	4 14 46.90	2.1761	25 52 53.9	4.027
5	2 35 36.72	2.0356	20 37 40.9	9.155	5	4 16 57.53	2.1783	25 56 51.8	3.904
6	2 37 38.95	2.0388	20 46 47.4	9.062	6	4 19 8.30	2.1805	26 0 42.4	3.782
7	2 39 41.38	2.0421	20 55 48.3	8.968	7	4 21 19.19	2.1825	26 4 25.6	3.658
8	2 41 44.00	2.0453	21 4 43.5	8.872	8	4 23 30.20	2.1845	26 8 1.3	3.533
9	2 43 46.82	2.0487	21 13 32.9	8.775	9	4 25 41.33	2.1864	26 11 29.6	3.409
10	2 45 49.84	2.0520	21 22 16.5	8.678	10	4 27 52.57	2.1883	26 14 50.4	3.284
11	2 47 53.06	2.0553	21 30 54.3	8.582	11	4 30 3.93	2.1902	26 18 3.7	3.159
12	2 49 56.47	2.0585	21 39 26.3	8.483	12	4 32 15.39	2.1919	26 21 9.5	3.034
13	2 52 0.08	2.0618	21 47 52.3	8.384	13	4 34 26.96	2.1936	26 24 7.8	2.908
14	2 54 3.89	2.0652	21 56 12.4	8.285	14	4 36 38.62	2.1952	26 26 58.5	2.782
15	2 56 7.90	2.0684	22 4 26.5	8.185	15	4 38 50.38	2.1968	26 29 41.6	2.655
16	2 58 12.10	2.0717	22 12 34.6	8.084	16	4 41 2.24	2.1983	26 32 17.1	2.528
17	3 0 16.50	2.0750	22 20 36.6	7.983	17	4 43 14.18	2.1997	26 34 45.0	2.402
18	3 2 21.10	2.0783	22 28 32.5	7.880	18	4 45 26.20	2.2011	26 37 5.3	2.274
19	3 4 25.90	2.0816	22 36 22.2	7.777	19	4 47 38.31	2.2024	26 39 17.9	2.146
20	3 6 30.89	2.0848	22 44 5.7	7.673	20	4 49 50.49	2.2036	26 41 22.8	2.018
21	3 8 36.08	2.0881	22 51 43.0	7.569	21	4 52 2.74	2.2047	26 43 20.1	1.891
22	3 10 41.46	2.0913	22 59 14.0	7.464	22	4 54 15.05	2.2058	26 45 9.7	1.763
23	3 12 47.04	2.0946	N. 23 6 38.7	7.358	23	4 56 27.43	2.2068	N. 26 46 51.6	1.634
	SATURDAY 18.					MONDAY 20.			
0	3 14 52.81	2.0978	N. 23 13 57.0	7.252	0	4 58 39.87	2.2078	N. 26 48 25.8	1.505
1	3 16 58.77	2.1010	23 21 8.9	7.145	1	5 0 52.37	2.2087	26 49 52.2	1.376
2	3 19 4.93	2.1043	23 28 14.4	7.038	2	5 3 4.91	2.2094	26 51 10.9	1.248
3	3 21 11.28	2.1073	23 35 13.4	6.928	3	5 5 17.50	2.2102	26 52 21.9	1.118
4	3 23 17.81	2.1105	23 42 5.8	6.819	4	5 7 30.13	2.2108	26 53 25.1	0.988
5	3 25 24.54	2.1137	23 48 51.7	6.710	5	5 9 42.79	2.2113	26 54 20.5	0.859
6	3 27 31.45	2.1167	23 55 31.0	6.600	6	5 11 55.49	2.2119	26 55 8.2	0.730
7	3 29 38.54	2.1198	24 2 3.7	6.489	7	5 14 8.22	2.2123	26 55 48.1	0.600
8	3 31 45.82	2.1228	24 8 29.7	6.378	8	5 16 20.97	2.2126	26 56 20.2	0.471
9	3 33 53.28	2.1258	24 14 49.0	6.265	9	5 18 33.73	2.2128	26 56 44.6	0.341
10	3 36 0.92	2.1288	24 21 1.5	6.153	10	5 20 46.51	2.2131	26 57 1.1	0.211
11	3 38 8.74	2.1318	24 27 7.3	6.039	11	5 22 59.30	2.2132	26 57 9.9	+0.082
12	3 40 16.74	2.1348	24 33 6.2	5.925	12	5 25 12.09	2.2132	26 57 10.9	−0.049
13	3 42 24.91	2.1377	24 38 58.3	5.810	13	5 27 24.88	2.2132	26 57 4.0	0.179
14	3 44 33.26	2.1406	24 44 43.4	5.695	14	5 29 37.67	2.2131	26 56 49.4	0.308
15	3 46 41.78	2.1433	24 50 21.7	5.580	15	5 31 50.45	2.2128	26 56 27.0	0.438
16	3 48 50.46	2.1461	24 55 53.0	5.463	16	5 34 3.21	2.2126	26 55 56.8	0.568
17	3 50 59.31	2.1488	25 1 17.3	5.347	17	5 36 15.96	2.2123	26 55 18.8	0.698
18	3 53 8.32	2.1516	25 6 34.6	5.230	18	5 38 28.68	2.2118	26 54 33.0	0.828
19	3 55 17.50	2.1543	25 11 44.9	5.112	19	5 40 41.38	2.2114	26 53 39.5	0.957
20	3 57 26.84	2.1569	25 16 48.0	4.993	20	5 42 54.05	2.2108	26 52 38.2	1.087
21	3 59 36.33	2.1594	25 21 44.0	4.873	21	5 45 6.68	2.2102	26 51 29.1	1.216
22	4 1 45.97	2.1620	25 26 32.8	4.754	22	5 47 19.27	2.2094	26 50 12.3	1.344
23	4 3 55.77	2.1645	25 31 14.5	4.634	23	5 49 31.81	2.2086	26 48 47.8	1.473
24	4 6 5.71	2.1669	N. 25 35 48.9	4.513	24	5 51 44.30	2.2078	N. 26 47 15.5	1.603

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

r.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	TUESDAY 21.			
	h m s	s	° ′ ″	″
	5 51 44.30	2.2078	N. 26 47 15.5	1.603
	5 53 56.74	2.2068	26 45 35.5	1.732
	5 56 9.12	2.2058	26 43 47.7	1.860
	5 58 21.44	2.2048	26 41 52.3	1.988
	6 0 33.69	2.2036	26 39 49.2	2.116
	6 2 45.87	2.2024	26 37 38.4	2.244
	6 4 57.98	2.2011	26 35 19.9	2.372
	6 7 10.00	2.1997	26 32 53.8	2.498
	6 9 21.94	2.1983	26 30 20.1	2.626
	6 11 33.79	2.1968	26 27 38.7	2.753
	6 13 45.55	2.1952	26 24 49.8	2.878
	6 15 57.21	2.1935	26 21 53.3	3.005
	6 18 8.77	2.1918	26 18 49.2	3.131
	6 20 20.23	2.1900	26 15 37.6	3.257
	6 22 31.57	2.1882	26 12 18.4	3.382
	6 24 42.81	2.1863	26 8 51.8	3.506
	6 26 53.93	2.1844	26 5 17.7	3.631
	6 29 4.94	2.1824	26 1 36.1	3.755
	6 31 15.82	2.1803	25 57 47.1	3.878
	6 33 26.57	2.1782	25 53 50.8	4.000
	6 35 37.20	2.1760	25 49 47.1	4.123
	6 37 47.69	2.1738	25 45 36.0	4.246
	6 39 58.05	2.1714	25 41 17.6	4.368
	6 42 8.26	2.1690	N. 25 36 51.9	4.489
	WEDNESDAY 22.			
0	6 44 18.33	2.1667	N. 25 32 18.9	4.610
1	6 46 28.26	2.1642	25 27 38.7	4.730
2	6 48 38.03	2.1616	25 22 51.3	4.849
3	6 50 47.65	2.1591	25 17 56.8	4.968
4	6 52 57.12	2.1565	25 12 55.1	5.088
5	6 55 6.43	2.1538	25 7 46.3	5.206
6	6 57 15.58	2.1511	25 2 30.4	5.324
7	6 59 24.56	2.1483	24 57 7.4	5.441
8	7 1 33.38	2.1456	24 51 37.5	5.557
9	7 3 42.03	2.1428	24 46 0.6	5.673
10	7 5 50.51	2.1398	24 40 16.8	5.788
11	7 7 58.81	2.1369	24 34 26.0	5.903
12	7 10 6.94	2.1340	24 28 28.4	6.017
13	7 12 14.89	2.1310	24 22 24.0	6.131
14	7 14 22.66	2.1280	24 16 12.7	6.244
15	7 16 30.25	2.1250	24 9 54.7	6.357
16	7 18 37.66	2.1219	24 3 29.9	6.468
17	7 20 44.88	2.1188	23 56 58.5	6.579
18	7 22 51.92	2.1157	23 50 20.4	6.690
19	7 24 58.76	2.1124	23 43 35.7	6.800
20	7 27 5.41	2.1093	23 36 44.4	6.909
21	7 29 11.87	2.1061	23 29 46.6	7.018
22	7 31 18.14	2.1028	23 22 42.3	7.126
23	7 33 24.21	2.0996	23 15 31.5	7.233
24	7 35 30.09	2.0963	N. 23 8 14.3	7.339

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	THURSDAY 23.			
	h m s	s	° ′ ″	″
0	7 35 30.09	2.0963	N. 23 8 14.3	7.339
1	7 37 35.77	2.0931	23 0 50.8	7.444
2	7 39 41.26	2.0898	22 53 21.0	7.549
3	7 41 46.54	2.0864	22 45 44.9	7.654
4	7 43 51.63	2.0831	22 38 2.5	7.758
5	7 45 56.51	2.0797	22 30 13.9	7.861
6	7 48 1.19	2.0763	22 22 19.2	7.963
7	7 50 5.67	2.0730	22 14 18.4	8.064
8	7 52 9.95	2.0697	22 6 11.5	8.166
9	7 54 14.03	2.0663	21 57 58.5	8.266
10	7 56 17.90	2.0628	21 49 39.6	8.365
11	7 58 21.57	2.0594	21 41 14.7	8.463
12	8 0 25.03	2.0560	21 32 44.0	8.561
13	8 2 28.29	2.0527	21 24 7.4	8.658
14	8 4 31.35	2.0493	21 15 25.0	8.754
15	8 6 34.20	2.0458	21 6 36.9	8.850
16	8 8 36.85	2.0425	20 57 43.0	8.946
17	8 10 39.30	2.0392	20 48 43.4	9.040
18	8 12 41.55	2.0358	20 39 38.2	9.133
19	8 14 43.59	2.0323	20 30 27.5	9.225
20	8 16 45.43	2.0290	20 21 11.2	9.318
21	8 18 47.07	2.0257	20 11 49.4	9.408
22	8 20 48.51	2.0223	20 2 22.2	9.498
23	8 22 49.75	2.0190	N. 19 52 49.6	9.588
	FRIDAY 24.			
0	8 24 50.79	2.0157	N. 19 43 11.6	9.678
1	8 26 51.63	2.0123	19 33 28.3	9.765
2	8 28 52.27	2.0091	19 23 39.8	9.852
3	8 30 52.72	2.0058	19 13 46.1	9.938
4	8 32 52.97	2.0026	19 3 47.2	10.024
5	8 34 53.03	1.9994	18 53 43.2	10.109
6	8 36 52.90	1.9962	18 43 34.1	10.194
7	8 38 52.57	1.9929	18 33 19.9	10.278
8	8 40 52.05	1.9898	18 23 0.8	10.359
9	8 42 51.35	1.9868	18 12 36.8	10.441
10	8 44 50.46	1.9836	18 2 7.9	10.523
11	8 46 49.38	1.9805	17 51 34.1	10.603
12	8 48 48.12	1.9775	17 40 55.5	10.683
13	8 50 46.68	1.9745	17 30 12.2	10.761
14	8 52 45.06	1.9715	17 19 24.2	10.838
15	8 54 43.26	1.9686	17 8 31.6	10.916
16	8 56 41.29	1.9657	16 57 34.3	10.993
17	8 58 39.14	1.9628	16 46 32.5	11.068
18	9 0 36.82	1.9599	16 35 26.2	11.143
19	9 2 34.33	1.9571	16 24 15.4	11.218
20	9 4 31.67	1.9543	16 13 0.1	11.291
21	9 6 28.85	1.9516	16 1 40.5	11.363
22	9 8 25.86	1.9488	15 50 16.6	11.434
23	9 10 22.71	1.9462	15 38 48.4	11.506
24	9 12 19.40	1.9436	N. 15 27 15.9	11.576

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.	Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	SATURDAY 25.					MONDAY 27.			
	h m s	s	° ′ ″	″		h m s	s	° ′ ″	″
0	9 12 19.40	1.9436	N. 15 27 15.9	11.576	0	10 43 34.56	1.8818	N. 5 5 20.5	14.043
1	9 14 15.94	1.9410	15 15 39.3	11.645	1	10 45 27.48	1.8822	4 51 16.9	14.077
2	9 16 12.32	1.9384	15 3 58.5	11.714	2	10 47 20.42	1.8825	4 37 11.3	14.108
3	9 18 8.55	1.9360	14 52 13.6	11.782	3	10 49 13.38	1.8830	4 23 3.9	14.139
4	9 20 4.64	1.9336	14 40 24.7	11.848	4	10 51 6.38	1.8836	4 8 54.6	14.169
5	9 22 0.58	1.9312	14 28 31.8	11.915	5	10 52 59.41	1.8842	3 54 43.6	14.198
6	9 23 56.38	1.9288	14 16 34.9	11.981	6	10 54 52.48	1.8848	3 40 30.8	14.226
7	9 25 52.04	1.9265	14 4 34.1	12.045	7	10 56 45.59	1.8856	3 26 16.3	14.253
8	9 27 47.56	1.9243	13 52 29.5	12.109	8	10 58 38.75	1.8865	3 12 0.2	14.281
9	9 29 42.95	1.9220	13 40 21.0	12.173	9	11 0 31.97	1.8875	2 57 42.5	14.308
10	9 31 38.20	1.9198	13 28 8.7	12.236	10	11 2 25.25	1.8885	2 43 23.3	14.333
11	9 33 33.33	1.9178	13 15 52.7	12.297	11	11 4 18.59	1.8896	2 29 2.5	14.358
12	9 35 28.33	1.9157	13 3 33.1	12.358	12	11 6 12.00	1.8908	2 14 40.3	14.381
13	9 37 23.21	1.9137	12 51 9.8	12.418	13	11 8 5.48	1.8920	2 0 16.7	14.404
14	9 39 17.97	1.9118	12 38 42.9	12.478	14	11 9 59.04	1.8933	1 45 51.8	14.426
15	9 41 12.62	1.9098	12 26 12.5	12.536	15	11 11 52.68	1.8948	1 31 25.6	14.447
16	9 43 7.15	1.9079	12 13 38.6	12.593	16	11 13 46.41	1.8963	1 16 58.2	14.468
17	9 45 1.57	1.9062	12 1 1.3	12.651	17	11 15 40.23	1.8978	1 2 29.5	14.488
18	9 46 55.89	1.9045	11 48 20.5	12.708	18	11 17 34.15	1.8995	0 47 59.7	14.507
19	9 48 50.11	1.9028	11 35 36.4	12.763	19	11 19 28.17	1.9013	0 33 28.9	14.524
20	9 50 44.23	1.9012	11 22 48.9	12.818	20	11 21 22.30	1.9031	0 18 57.0	14.541
21	9 52 38.25	1.8996	11 9 58.2	12.873	21	11 23 16.54	1.9050	N. 0 4 24.1	14.557
22	9 54 32.18	1.8981	10 57 4.2	12.926	22	11 25 10.90	1.9070	S. 0 10 9.8	14.570
23	9 56 26.02	1.8967	N. 10 44 7.1	12.978	23	11 27 5.38	1.9091	S. 0 24 44.5	14.584
	SUNDAY 26.					TUESDAY 28.			
0	9 58 19.78	1.8953	N. 10 31 6.9	13.029	0	11 28 59.99	1.9113	S. 0 39 20.0	14.598
1	10 0 13.46	1.8940	10 18 3.6	13.081	1	11 30 54.73	1.9135	0 53 56.3	14.611
2	10 2 7.06	1.8928	10 4 57.2	13.132	2	11 32 49.61	1.9159	1 8 33.3	14.622
3	10 4 0.59	1.8915	9 51 47.8	13.181	3	11 34 44.64	1.9183	1 23 10.9	14.632
4	10 5 54.04	1.8903	9 38 35.5	13.229	4	11 36 39.81	1.9208	1 37 49.2	14.643
5	10 7 47.43	1.8893	9 25 20.3	13.278	5	11 38 35.14	1.9234	1 52 28.0	14.651
6	10 9 40.76	1.8883	9 12 2.2	13.325	6	11 40 30.62	1.9261	2 7 7.3	14.659
7	10 11 34.03	1.8873	8 58 41.3	13.371	7	11 42 26.27	1.9289	2 21 47.1	14.666
8	10 13 27.24	1.8864	8 45 17.7	13.417	8	11 44 22.09	1.9318	2 36 27.2	14.672
9	10 15 20.40	1.8856	8 31 51.3	13.462	9	11 46 18.08	1.9347	2 51 7.7	14.677
10	10 17 13.51	1.8848	8 18 22.3	13.506	10	11 48 14.25	1.9378	3 5 48.4	14.680
11	10 19 6.58	1.8843	8 4 50.6	13.550	11	11 50 10.61	1.9408	3 20 29.3	14.683
12	10 20 59.62	1.8837	7 51 16.3	13.593	12	11 52 7.15	1.9440	3 35 10.3	14.684
13	10 22 52.62	1.8831	7 37 39.5	13.634	13	11 54 3.89	1.9473	3 49 51.4	14.685
14	10 24 45.59	1.8827	7 24 0.2	13.675	14	11 56 0.83	1.9508	4 4 32.5	14.685
15	10 26 38.54	1.8823	7 10 18.5	13.715	15	11 57 57.98	1.9543	4 19 13.6	14.684
16	10 28 31.46	1.8819	6 56 34.4	13.755	16	11 59 55.34	1.9578	4 33 54.6	14.682
17	10 30 24.37	1.8817	6 42 47.9	13.794	17	12 1 52.92	1.9615	4 48 35.4	14.678
18	10 32 17.26	1.8814	6 28 59.1	13.833	18	12 3 50.72	1.9653	5 3 16.0	14.674
19	10 34 10.14	1.8813	6 15 8.0	13.870	19	12 5 48.75	1.9691	5 17 56.3	14.669
20	10 36 3.02	1.8813	6 1 14.7	13.906	20	12 7 47.01	1.9730	5 32 36.3	14.663
21	10 37 55.90	1.8813	5 47 19.3	13.942	21	12 9 45.51	1.9770	5 47 15.8	14.654
22	10 39 48.78	1.8813	5 33 21.7	13.977	22	12 11 44.25	1.9812	6 1 54.8	14.646
23	10 41 41.66	1.8815	5 19 22.1	14.010	23	12 13 43.25	1.9854	6 16 33.3	14.637
24	10 43 34.56	1.8818	N. 5 5 20.5	14.043	24	12 15 42.50	1.9897	S. 6 31 11.2	14.626

GREENWICH MEAN TIME.

THE MOON'S RIGHT ASCENSION AND DECLINATION.

our.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	WEDNESDAY 29.			
	h m s	s	° ′ ″	″
0	12 15 42.50	1.9897	S. 6 31 11.2	14.626
1	12 17 42.01	1.9941	6 45 48.4	14.613
2	12 19 41.79	1.9986	7 0 24.8	14.600
3	12 21 41.84	2.0031	7 15 0.4	14.586
4	12 23 42.16	2.0078	7 29 35.1	14.570
5	12 25 42.77	2.0126	7 44 8.8	14.553
6	12 27 43.67	2.0174	7 58 41.5	14.536
7	12 29 44.86	2.0223	8 13 13.1	14.517
8	12 31 46.35	2.0274	8 27 43.5	14.496
9	12 33 48.15	2.0326	8 42 12.6	14.474
10	12 35 50.26	2.0378	8 56 40.4	14.452
11	12 37 52.68	2.0431	9 11 6.8	14.428
12	12 39 55.43	2.0485	9 25 31.7	14.402
13	12 41 58.50	2.0540	9 39 55.0	14.375
14	12 44 1.91	2.0596	9 54 16.7	14.348
15	12 46 5.65	2.0653	10 8 36.7	14.318
16	12 48 9.74	2.0710	10 22 54.8	14.287
17	12 50 14.17	2.0768	10 37 11.1	14.255
18	12 52 18.96	2.0828	10 51 25.4	14.221
19	12 54 24.10	2.0888	11 5 37.6	14.186
20	12 56 29.61	2.0949	11 19 47.7	14.149
21	12 58 35.49	2.1012	11 33 55.5	14.112
22	13 0 41.75	2.1075	11 48 1.1	14.073
23	13 2 48.39	2.1138	S. 12 2 4.3	14.033
	THURSDAY 30.			
0	13 4 55.41	2.1203	S. 12 16 5.0	13.990
1	13 7 2.83	2.1269	12 30 3.1	13.947
2	13 9 10.64	2.1335	12 43 58.6	13.902
3	13 11 18.85	2.1403	12 57 51.3	13.855
4	13 13 27.47	2.1472	13 11 41.2	13.807
5	13 15 36.51	2.1541	13 25 28.1	13.757
6	13 17 45.96	2.1610	13 39 12.0	13.705
7	13 19 55.83	2.1681	13 52 52.7	13.652
8	13 22 6.13	2.1753	14 6 30.2	13.598
9	13 24 16.86	2.1824	14 20 4.4	13.542
10	13 26 28.02	2.1898	14 33 35.2	13.484
11	13 28 39.63	2.1972	14 47 2.5	13.424
12	13 30 51.68	2.2046	15 0 26.1	13.363
13	13 33 4.18	2.2122	15 13 46.0	13.300
14	13 35 17.14	2.2198	15 27 2.1	13.236
15	13 37 30.56	2.2275	15 40 14.3	13.169
16	13 39 44.44	2.2352	15 53 22.4	13.101
17	13 41 58.78	2.2430	16 6 26.4	13.032
18	13 44 13.60	2.2510	16 19 26.2	12.960
19	13 46 28.90	2.2589	16 32 21.6	12.886
20	13 48 44.67	2.2669	16 45 12.5	12.811
21	13 51 0.93	2.2751	16 57 58.9	12.734
22	13 53 17.68	2.2832	17 10 40.6	12.655
23	13 55 34.91	2.2913	17 23 17.5	12.574
24	13 57 52.64	2.2997	S. 17 35 49.5	12.492

Hour.	Right Ascension.	Diff. for 1 Min.	Declination.	Diff. for 1 Min.
	FRIDAY 31.			
	h m s	s	° ′ ″	″
0	13 57 52.64	2.2997	S. 17 35 49.5	12.492
1	14 0 10.87	2.3080	17 48 16.5	12.408
2	14 2 29.60	2.3164	18 0 38.4	12.322
3	14 4 48.84	2.3248	18 12 55.1	12.233
4	14 7 8.58	2.3333	18 25 6.4	12.143
5	14 9 28.84	2.3419	18 37 12.2	12.050
6	14 11 49.61	2.3504	18 49 12.4	11.956
7	14 14 10.89	2.3590	19 1 6.9	11.860
8	14 16 32.69	2.3677	19 12 55.6	11.763
9	14 18 55.01	2.3764	19 24 38.4	11.663
10	14 21 17.86	2.3852	19 36 15.1	11.560
11	14 23 41.23	2.3939	19 47 45.6	11.455
12	14 26 5.13	2.4028	19 59 9.7	11.349
13	14 28 29.56	2.4115	20 10 27.5	11.242
14	14 30 54.51	2.4203	20 21 38.7	11.131
15	14 33 19.99	2.4292	20 32 43.2	11.018
16	14 35 46.01	2.4381	20 43 40.9	10.904
17	14 38 12.56	2.4469	20 54 31.7	10.788
18	14 40 39.64	2.4558	21 5 15.4	10.668
19	14 43 7.25	2.4647	21 15 51.9	10.548
20	14 45 35.40	2.4736	21 26 21.2	10.426
21	14 48 4.08	2.4824	21 36 43.0	10.301
22	14 50 33.29	2.4913	21 46 57.3	10.174
23	14 53 3.03	2.5002	S. 21 57 3.9	10.045
	SATURDAY, JANUARY 1, 1916.			
0	14 55 33.31	2.5091	S. 22 7 2.7	9.914

PHASES OF THE MOON.

			d	h	m
●	New Moon	Dec.	6	6	3.7
☽	First Quarter		12	23	38.4
○	Full Moon		21	0	52.3
☾	Last Quarter		29	0	58.8

			d	h
☾	Perigee	Dec.	6	13.3
☾	Apogee		20	12.6

MERCURY, 1915.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	18 33 15.71	+17.599	−24 49 22.6	+ 2.94	23 56.1
2	18 40 18.69	17.649	24 47 29.0	6.53	23 59.3
3	18 47 22.83	17.695	24 44 8.7	10.16	. . . . .
4	18 54 28.01	17.736	24 39 20.7	13.84	0 2.4
5	19 1 34.12	17.772	24 33 4.0	17.56	0 5.6
6	19 8 41.02	+17.802	−24 25 17.6	+ 21.31	0 8.8
7	19 15 48.58	17.827	24 16 0.6	25.10	0 12.0
8	19 22 56.66	17.846	24 5 12.2	28.94	0 15.2
9	19 30 5.11	17.858	23 52 51.6	32.79	0 18.4
10	19 37 13.77	17.863	23 38 58.2	36.67	0 21.6
11	19 44 22.46	+17.860	−23 23 31.3	+ 40.58	0 24.8
12	19 51 30.99	17.850	23 6 30.4	44.50	0 28.0
13	19 58 39.17	17.830	22 47 55.2	48.44	0 31.2
14	20 5 46.76	17.801	22 27 45.4	52.38	0 34.4
15	20 12 53.53	17.761	22 6 1.1	56.31	0 37.6
16	20 19 59.21	+17.710	−21 42 42.4	+ 60.24	0 40.8
17	20 27 3.49	17.645	21 17 49.7	64.14	0 43.9
18	20 34 6.05	17.566	20 51 23.7	68.01	0 47.0
19	20 41 6.51	17.470	20 23 25.4	71.83	0 50.0
20	20 48 4.46	17.356	19 53 56.2	75.59	0 53.0
21	20 54 59.43	+17.221	−19 22 58.0	+ 79.25	0 56.0
22	21 1 50.88	17.062	18 50 33.1	82.80	0 58.9
23	21 8 38.19	16.876	18 16 44.7	86.21	1 1.8
24	21 15 20.66	16.658	17 41 36.5	89.44	1 4.5
25	21 21 57.49	16.405	17 5 13.2	92.46	1 7.2
26	21 28 27.77	+16.111	−16 27 40.5	+ 95.22	1 9.7
27	21 34 50.46	15.771	15 49 5.2	97.67	1 12.2
28	21 41 4.37	15.378	15 9 35.5	99.74	1 14.5
29	21 47 8.14	14.926	14 29 21.1	101.38	1 16.6
30	21 53 0.28	14.407	13 48 33.2	102.52	1 18.5
31	21 58 39.09	+13.814	−13 7 24.9	+103.07	1 20.2
32	22 4 2.70	+13.139	−12 26 11.1	+102.96	1 21.7

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter	2.32	2.33	2.37	2.45	2.56	2.74	3.02
Horizontal Parallax	6.11	6.15	6 25	6.45	6.75	7.22	7.95

FEBRUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Me ian sa
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h
1	22 4 2.70	+13.139	−12 26 11.1	+102.96	1
2	22 9 9.05	12.375	11 45 8.9	102.09	1
3	22 13 55.91	11.514	11 4 37.4	100.39	1
4	22 18 20.92	10.552	10 24 57.5	97.78	1
5	22 22 21.59	9.486	9 46 31.9	94.18	1
6	22 25 55.38	+ 8.312	− 9 9 44.9	+ 89.55	1
7	22 28 59.76	7.035	8 35 2.3	83.82	1
8	22 31 32.28	5.659	8 2 50.2	77.00	1
9	22 33 30.68	4.194	7 33 34.9	69.09	1
10	22 34 53.02	2.657	7 7 42.1	60.14	1
11	22 35 37.78	+ 1.066	− 6 45 36.0	+ 50.22	1
12	22 35 44.01	− 0.550	6 27 38.1	39.48	1
13	22 35 11.44	2.161	6 14 6.4	28.07	1
14	22 34 0.63	3.731	6 5 14.3	16.21	1
15	22 32 13.03	5.219	6 1 9.5	+ 4.17	0
16	22 29 51.08	− 6.586	− 6 1 53.3	− 7.78	0
17	22 26 58.18	7.791	6 7 19.5	19.31	0
18	22 23 38.68	8.797	6 17 14.5	30.12	0
19	22 19 57.73	9.574	6 31 17.3	39.91	0
20	22 16 1.11	10.100	6 49 0.2	48.42	0
21	22 11 55.00	−10.364	− 7 9 49.9	− 55.46	0
22	22 7 45.68	10.368	7 33 9.5	60.90	0 23
23	22 3 39.28	10.124	7 58 19.9	64.69	23
24	21 59 41.51	9.654	8 24 41.8	66.87	23
25	21 55 57.45	8.987	8 51 37.8	67.55	23
26	21 52 31.44	− 8.156	− 9 18 33.5	− 66.88	23
27	21 49 26.95	7.199	9 44 58.7	65.03	23
28	21 46 46.61	6.150	10 10 27.4	62.21	23
29	21 44 32.22	5.042	10 34 38.6	58.61	23
30	21 42 44.84	3.904	10 57 15.7	54.40	23
31	21 41 24.90	− 2.759	−11 18 6.2	− 49.75	22 5
32	21 40 32.31	− 1.628	−11 37 1.0	− 44.78	22 5

Day of the Month.	5th.	10th.	15th.	20th.	2
	″	″	″	″	″
Semidiameter	3.42	3.98	4.64	5.14	5.
Horizontal Parallax . . .	9.02	10.52	12.24	13.56	13 8

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.				
Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
21 44 32.22	− 5.042	−10 34 38.6	−58.61	23 6.2	1	23 11 3.16	+13.305	− 7 45 3.1	+ 74.77	22 37.3
21 42 44.84	3.904	10 57 15.7	54.40	23 0.9	2	23 16 24.86	13.503	7 14 30.8	77.91	22 38.8
21 41 24.90	2.759	11 18 6.2	49.75	22 56.1	3	23 21 51.26	13.696	6 42 43.8	81.00	22 40.4
21 40 32.31	1.628	11 37 1.0	44.78	22 51.7	4	23 27 22.25	13.886	6 9 43.5	84.03	22 42.1
21 40 6.53	− 0.527	11 53 54.1	39.62	22 47.8	5	23 32 57.79	14.074	5 35 31.1	87.00	22 43.8
21 40 6.70	+ 0.534	−12 8 42.0	−34.36	22 44.3	6	23 38 37.82	+14.261	− 5 0 7.8	+ 89.92	22 45.6
21 40 31.77	1.547	12 21 23.0	29.06	22 41.1	7	23 44 22.34	14.449	4 23 35.2	92.79	22 47.5
21 41 20.54	2.507	12 31 56.8	23.77	22 38.3	8	23 50 11.36	14.637	3 45 54.5	95.60	22 49.4
21 42 31.67	3.410	12 40 24.4	18.54	22 35.9	9	23 56 4.92	14.828	3 7 7.1	98.34	22 51.4
21 44 3.81	4.258	12 46 47.2	13.38	22 33.8	10	0 2 3.10	15.021	2 27 14.4	101.04	22 53.5
21 45 55.61	+ 5.050	−12 51 7.5	− 8.32	22 32.0	11	0 8 5.95	+15.218	− 1 46 17.8	+103.67	22 55.7
21 48 5.75	5.787	12 53 27.7	− 3.38	22 30.5	12	0 14 13.60	15.420	1 4 18.8	106.23	22 58.0
21 50 32.94	6.472	12 53 50.6	+ 1.45	22 29.2	13	0 20 26.17	15.628	− 0 21 19.1	108.73	23 0.4
21 53 15.97	7.106	12 52 19.0	6.16	22 28.2	14	0 26 43.81	15.842	+ 0 22 39.5	111.14	23 2.8
21 56 13.67	7.695	12 48 55.6	10.76	22 27.5	15	0 33 6.66	16.063	1 7 35.1	113.47	23 5.3
21 59 24.97	+ 8.240	−12 43 43.2	+15.25	22 27.0	16	0 39 34.93	+16.292	+ 1 53 25.7	+115.73	23 7.9
22 2 48.87	8.745	12 36 44.5	19.62	22 26.6	17	0 46 8.79	16.530	2 40 9.1	117.87	23 10.7
22 6 24.44	9.213	12 28 2.2	23.89	22 26.4	18	0 52 48.46	16.776	3 27 42.7	119.91	23 13.5
22 10 10.81	9.646	12 17 38.8	28.05	22 26.4	19	0 59 34.14	17.031	4 16 3.6	121.81	23 16.4
22 14 7.21	10.049	12 5 36.7	32.12	22 26.5	20	1 6 26.06	17.295	5 5 8.7	123.58	23 19.4
22 18 12.93	+10.423	−11 51 58.1	+36.09	22 26.8	21	1 13 24.42	+17.569	+ 5 54 54.3	+125.19	23 22.5
22 22 27.30	10.771	11 36 45.3	39.97	22 27.2	22	1 20 29.45	17.851	6 45 16.5	126.62	23 25.8
22 26 49.74	11.095	11 20 0.3	43.77	22 27.8	23	1 27 41.32	18.140	7 36 10.5	127.84	23 29.2
22 31 19.71	11.399	11 1 45.1	47.49	22 28.5	24	1 35 0.22	18.436	8 27 31.1	128.84	23 32.7
22 35 56.74	11.684	10 42 1.5	51.13	22 29.2	25	1 42 26.28	18.736	9 19 12.6	129.57	23 36.3
22 40 40.40	+11.951	−10 20 51.4	+54.70	22 30.1	26	1 49 59.59	+19.040	+10 11 8.1	+130.00	23 40.0
22 45 30.30	12.204	9 58 16.5	58.20	22 31.1	27	1 57 40.19	19.343	11 3 10.3	130.12	23 43.9
22 50 26.11	12.444	9 34 18.3	61.64	22 32.2	28	2 5 28.06	19.644	11 55 11.0	129.87	23 47.9
22 55 27.54	12.673	9 8 58.3	65.01	22 33.3	29	2 13 23.07	19.938	12 47 0.9	129.22	23 52.0
23 0 34.33	12.891	8 42 18.2	68.32	22 34.6	30	2 21 25.01	20.221	13 38 30.0	128.12	23 56.2
23 5 46.27	+13.102	− 8 14 19.3	+71.57	22 35.9	31	2 29 33.54	+20.488	+14 29 27.6	+126.58	. . . . .
23 11 3.16	+13.305	− 7 45 3.1	+74.77	22 37.3	32	2 37 48.23	+20.733	+15 19 42.2	+124.54	0 0.6

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter	5.02	4.61	4.21	3.85	3.55	3.30
Horizontal Parallax .	13.22	12.16	11.09	10.14	9.35	8.69

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
	″	″	″	″	″	″
Semidiameter	3.09	2.92	2.78	2.66	2.57	2.52
Horizontal Parallax . . .	8.15	7.69	7.31	7.00	6.77	6.64

NOTE.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations decreasing; the sign − indicates that south declinations are increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	2 29 33.54	+20.488	+14 29 27.6	+126.58	. . . . .
2	2 37 48.23	20.733	15 19 42.2	124.54	0 0.6
3	2 46 8.48	20.950	16 9 1.8	122.00	0 5.0
4	2 54 33.58	21.136	16 57 13.8	118.92	0 9.5
5	3 3 2.69	21.283	17 44 5.8	115.33	0 14.0
6	3 11 34.84	+21.388	+18 29 25.5	+111.23	0 18.6
7	3 20 8.95	21.446	19 13 1.0	106.65	0 23.2
8	3 28 43.86	21.454	19 54 41.1	101.63	0 27.8
9	3 37 18.34	21.411	20 34 15.8	96.20	0 32.5
10	3 45 51.15	21.314	21 11 36.3	90.46	0 37.1
11	3 54 21.01	+21.165	+21 46 35.4	+ 84.43	0 41.7
12	4 2 46.68	20.965	22 19 7.3	78.20	0 46.2
13	4 11 6.94	20.715	22 49 7.9	71.83	0 50.6
14	4 19 20.64	20.419	23 16 34.6	65.39	0 54.9
15	4 27 26.71	20.080	23 41 26.5	58.94	0 59.1
16	4 35 24.14	+19.700	+24 3 43.9	+ 52.52	1 3.1
17	4 43 12.01	19.284	24 23 28.3	46.20	1 7.0
18	4 50 49.48	18.834	24 40 42.5	40.01	1 10.7
19	4 58 15.79	18.354	24 55 30.0	33.98	1 14.1
20	5 5 30.25	17.846	25 7 54.9	28.13	1 17.4
21	5 12 32.22	+17.314	+25 18 2.1	+ 22.50	1 20.5
22	5 19 21.13	16.759	25 25 56.9	17.10	1 23.4
23	5 25 56.46	16.182	25 31 44.8	11.94	1 26.0
24	5 32 17.71	15.586	25 35 31.8	7.02	1 28.4
25	5 38 24.43	14.971	25 37 23.7	+ 2.35	1 30.6
26	5 44 16.20	+14.340	+25 37 26.6	− 2.06	1 32.5
27	5 49 52.61	13.692	25 35 46.6	6.23	1 34.1
28	5 55 13.26	13.027	25 32 29.7	10.14	1 35.5
29	6 0 17.77	12.347	25 27 41.9	13.80	1 36.6
30	6 5 5.77	11.651	25 21 29.3	17.21	1 37.4
31	6 9 36.89	+10.940	+25 13 57.8	− 20.38	1 38.0
32	6 13 50.78	+10.214	+25 5 13.0	− 23.31	1 38.3

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter . . .	2.52	2.58	2.71	2.93	3.22	3.59	4.02
Horizontal Parallax	6.63	6.79	7.15	7.72	8.50	9.46	10.59

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	6 13 50.78	+10.214	+25 5 13.0	−23.31	1 38
2	6 17 47.06	9.473	24 55 20.7	26.01	1 3
3	6 21 25.37	8.717	24 44 26.6	28.46	1 37
4	6 24 45.37	7.947	24 32 36.3	30.69	1 37
5	6 27 46.72	7.163	24 19 55.2	32.70	1 3
6	6 30 29.08	+ 6.365	+24 6 28.5	−34.49	1 35
7	6 32 52.16	5.556	23 52 21.6	36.05	1 33
8	6 34 55.67	4.735	23 37 39.9	37.39	1 3
9	6 36 39.39	3.906	23 22 28.6	38.52	1 2
10	6 38 3.15	3.072	23 6 52.9	39.43	1 26
11	6 39 6.82	+ 2.235	+22 50 58.0	−40.12	1 24
12	6 39 50.41	1.398	22 34 49.1	40.59	1 2
13	6 40 13.98	+ 0.567	22 18 31.3	40.85	1 17
14	6 40 17.74	− 0.252	22 2 10.1	40.88	1 13
15	6 40 2.04	1.053	21 45 50.7	40.70	1 9
16	6 39 27.41	− 1.828	+21 29 38.5	−40.28	1 4
17	6 38 34.54	2.571	21 13 38.9	39.64	0 59
18	6 37 24.33	3.272	20 57 57.6	38.76	0 54
19	6 35 57.88	3.922	20 42 40.3	37.64	0 49
20	6 34 16.53	4.512	20 27 52.6	36.29	0 43
21	6 32 21.86	− 5.032	+20 13 40.4	−34.68	0 37
22	6 30 15.63	5.474	20 0 9.7	32.83	0 31
23	6 27 59.81	5.829	19 47 26.3	30.74	0 25
24	6 25 36.59	6.090	19 35 36.0	28.41	0 19
25	6 23 8.28	6.252	19 24 44.4	25.86	0 12
26	6 20 37.30	− 6.311	+19 14 56.8	−23.08	0 6
27	6 18 6.16	6.266	19 6 18.3	20.10	{ 0 0 { 23 53
28	6 15 37.37	6.116	18 58 53.3	16.95	23 47
29	6 13 13.42	5.863	18 52 45.7	13.66	23 41
30	6 10 56.73	5.511	18 47 58.6	10.25	23 35
31	6 8 49.59	− 5.068	+18 44 34.4	− 6.75	23 29
32	6 6 54.12	− 4.540	+18 42 34.5	− 3.23	23 23

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter . . .	4.50	5.01	5.49	5.85	5.99	5.8
Horizontal Parallax	11.86	13.20	14.47	15.43	15.79	15.3

NOTE.—The sign + indicates north declinations.

GREENWICH MEAN TIME.

JULY.					Day of Month.	AUGUST.				
Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.		Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
6 8 49.59	− 5.068	+18 44 34.4	− 6.75	23 29.3	1	7 45 46.14	+20.236	+21 44 26.7	− 23.05	23 13.8
6 6 54.12	4.540	18 42 34.5	− 3.23	23 23.6	2	7 53 56.65	20.626	21 33 54.9	29.62	23 18.2
6 5 12.29	3.934	18 41 59.5	+ 0.30	23 18.3	3	8 2 15.58	20.938	21 20 44.1	36.28	23 22.7
6 3 45.86	3.258	18 42 48.9	3.80	23 13.2	4	8 10 41.03	21.170	21 4 53.2	42.95	23 27.3
6 2 36.40	2.522	18 45 1.3	7.22	23 8.4	5	8 19 11.10	21.323	20 46 23.2	49.53	23 31.9
6 1 45.23	− 1.734	+18 48 34.4	+10.52	23 3.9	6	8 27 43.91	+21.399	+20 25 16.8	− 55.97	23 36.5
6 1 13.49	0.904	18 53 24.9	13.66	22 59.8	7	8 36 17.69	21.404	20 1 38.5	62.18	23 41.1
6 1 2.14	− 0.037	18 59 28.7	16.62	22 56.0	8	8 44 50.79	21.343	19 35 34.6	68.10	23 45.7
6 1 11.94	+ 0.858	19 6 41.0	19.36	22 52.6	9	8 53 21.70	21.223	19 7 12.4	73.69	23 50.3
6 1 43.49	1.775	19 14 56.1	21.85	22 49.5	10	9 1 49.08	21.051	18 36 40.3	78.92	23 54.7
6 2 37.26	+ 2.709	+19 24 7.6	+24.06	22 46.8	11	9 10 11.79	+20.835	+18 4 7.4	− 83.76	23 59.0
6 3 53.60	3.654	19 34 8.5	25.97	22 44.5	12	9 18 28.86	20.582	17 29 43.3	88.19	. . . . .
6 5 32.73	4.607	19 44 51.5	27.55	22 42.6	13	9 26 39.50	20.300	16 53 37.7	92.21	0 3.3
6 7 34.80	5.566	19 56 8.4	28.80	22 41.1	14	9 34 43.09	19.996	16 16 0.3	95.84	0 7.4
6 9 59.89	6.525	20 7 50.8	29.67	22 39.9	15	9 42 39.17	19.675	15 37 0.5	99.08	0 11.4
6 12 47.99	+ 7.484	+20 19 49.6	+30.17	22 39.1	16	9 50 27.42	+19.344	+14 56 47.4	−101.95	0 15.3
6 15 59.06	8.439	20 31 55.5	30.25	22 38.7	17	9 58 7.63	19.006	14 15 29.8	104.46	0 19.0
6 19 33.00	9.388	20 43 58.5	29.92	22 38.7	18	10 5 39.70	18.666	13 33 15.9	106.64	0 22.6
6 23 29.65	10.332	20 55 48.4	29.16	22 39.0	19	10 13 3.61	18.328	12 50 13.4	108.52	0 26.1
6 27 48.83	11.265	21 7 14.4	27.94	22 39.7	20	10 20 19.43	17.992	12 6 29.4	110.10	0 29.4
6 32 30.26	+12.185	+21 18 5.6	+26.25	22 40.8	21	10 27 27.26	+17.662	+11 22 10.5	−111.43	0 32.6
6 37 33.61	13.091	21 28 10.7	24.09	22 42.3	22	10 34 27.26	17.340	10 37 22.8	112.51	0 35.7
6 42 58.49	13.979	21 37 18.0	21.43	22 44.1	23	10 41 19.62	17.025	9 52 12.0	113.36	0 38.6
6 48 44.40	14.843	21 45 15.6	18.28	22 46.3	24	10 48 4.56	16.721	9 6 43.1	114.01	0 41.4
6 54 50.72	15.679	21 51 51.6	14.64	22 48.8	25	10 54 42.31	16.426	8 21 1.0	114.47	0 44.1
7 1 16.73	+16.482	+21 56 54.3	+10.50	22 51.5	26	11 1 13.12	+16.142	+ 7 35 9.9	−114.76	0 46.7
7 8 1.55	17.246	22 0 12.0	5.89	22 54.6	27	11 7 37.23	15.868	6 49 13.8	114.89	0 49.1
7 15 4.15	17.963	22 1 33.6	+ 0.83	22 58.0	28	11 13 54.89	15.605	6 3 16.3	114.87	0 51.5
7 22 23.34	18.627	22 0 48.7	− 4.64	23 1.6	29	11 20 6.35	15.351	5 17 20.9	114.72	0 53.7
7 29 57.77	19.231	21 57 47.8	10.49	23 5.5	30	11 26 11.84	15.107	4 31 30.6	114.45	0 55.9
7 37 45.92	+19.770	+21 52 22.7	−16.65	23 9.6	31	11 32 11.60	+14.873	+ 3 45 48.4	−114.05	0 57.9
7 45 46.14	+20.236	+21 44 26.7	−23.05	23 13.8	32	11 38 5.85	+14.648	+ 3 0 16.9	−113.56	0 59.9

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
midiameter	5.41	4.86	4.28	3.74	3.29	2.94
rizontal Parallax . .	14.26	12.79	11.26	9.85	8.67	7.75

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
	″	″	″	″	″	″
Semidiameter	2.70	2.55	2.47	2.45	2.47	2.51
Horizontal Parallax . . .	7.11	6.71	6.51	6.45	6.50	6.62

Note.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the gn − indicates that north declinations are decreasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	11 38 5.85	+14.648	+ 3 0 16.9	−113.56	0 59.9
2	11 43 54.80	14.431	2 14 58.6	112.96	1 1.8
3	11 49 38.64	14.223	1 29 55.9	112.26	1 3.6
4	11 55 17.56	14.022	0 45 11.1	111.47	1 5.3
5	12 0 51.73	13.827	+ 0 0 46.3	110.58	1 6.9
6	12 6 21.29	+13.637	− 0 43 16.4	−109.62	1 8.4
7	12 11 46.38	13.454	1 26 55.1	108.58	1 9.9
8	12 17 7.12	13.275	2 10 7.9	107.47	1 11.3
9	12 22 23.60	13.098	2 52 52.9	106.27	1 12.6
10	12 27 35.90	12.926	3 35 8.2	104.99	1 13.9
11	12 32 44.07	+12.755	− 4 16 51.9	−103.64	1 15.1
12	12 37 48.14	12.584	4 58 2.2	102.21	1 16.2
13	12 42 48.12	12.414	5 38 37.2	100.69	1 17.3
14	12 47 44.00	12.242	6 18 35.0	99.10	1 18.3
15	12 52 35.74	12.069	6 57 53.5	97.42	1 19.2
16	12 57 23.26	+11.891	− 7 36 30.7	− 95.67	1 20.0
17	13 2 6.46	11.708	8 14 24.6	93.81	1 20.8
18	13 6 45.20	11.519	8 51 32.8	91.86	1 21.5
19	13 11 19.31	11.322	9 27 53.1	89.81	1 22.1
20	13 15 48.58	11.115	10 3 22.9	87.65	1 22.6
21	13 20 12.76	+10.897	−10 37 59.6	− 85.38	1 23.1
22	13 24 31.54	10.666	11 11 40.3	82.99	1 23.5
23	13 28 44.58	10.418	11 44 21.9	80.45	1 23.8
24	13 32 51.46	10.152	12 16 1.1	77.79	1 23.9
25	13 36 51.70	9.865	12 46 34.3	74.95	1 24.0
26	13 40 44.77	+ 9.554	−13 15 57.5	− 71.95	1 23.9
27	13 44 30.05	9.215	13 44 6.3	68.75	1 23.7
28	13 48 6.83	8.845	14 10 55.8	65.34	1 23.4
29	13 51 34.31	8.440	14 36 20.7	61.70	1 22.9
30	13 54 51.61	7.995	15 0 15.2	57.80	1 22.2
31	13 57 57.74	+ 7.508	−15 22 32.7	− 53.61	1 21.4
32	14 0 51.59	+ 6.971	−15 43 6.0	− 49.10	1 20.3

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter	2.58	2.68	2.80	2.96	3.15	3.40
Horizontal Parallax	6.81	7.06	7.38	7.79	8.31	8.97

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Me ian sag
	h m s	s	° ′ ″	″	h
1	13 57 57.74	+ 7.508	−15 22 32.7	− 53.61	1
2	14 0 51.59	6.971	15 43 6.0	49.10	1
3	14 3 31.93	6.381	16 1 46.9	44.25	1
4	14 5 57.42	5.733	16 18 26.5	38.99	1
5	14 8 6.59	5.020	16 32 54.8	33.30	1
6	14 9 57.86	+ 4.240	−16 45 0.8	− 27.12	1
7	14 11 29.55	3.388	16 54 32.4	20.43	1
8	14 12 39.90	2.462	17 1 16.5	13.15	1
9	14 13 27.09	1.458	17 4 58.6	− 5.25	1
10	14 13 49.30	+ 0.381	17 5 23.5	+ 3.29	1
11	14 13 44.81	− 0.766	−17 2 15.3	+ 12.51	0
12	14 13 12.05	1.973	16 55 18.0	22.38	0
13	14 12 9.74	3.225	16 44 16.2	32.87	0
14	14 10 37.07	4.500	16 28 55.9	43.90	0
15	14 8 33.81	5.769	16 9 6.4	55.28	0
16	14 6 0.55	− 6.993	−15 44 41.8	+ 66.77	0
17	14 2 58.88	8.128	15 15 43.1	78.06	0
18	13 59 31.52	9.124	14 42 20.3	88.70	0
19	13 55 42.45	9.928	14 4 54.6	98.21	0
20	13 51 36.89	10.490	13 23 59.8	106.04	{ 0 { 23
21	13 47 21.20	−10.765	−12 40 22.6	+111.64	23 43
22	13 43 2.65	10.724	11 55 2.1	114.57	23 3
23	13 38 49.04	10.353	11 9 6.6	114.52	23 27
24	13 34 48.26	9.658	10 23 50.0	111.33	23 20
25	13 31 7.81	8.665	9 40 27.0	105.09	23 13
26	13 27 54.37	− 7.416	− 9 0 7.8	+ 96.07	23 6
27	13 25 13.45	5.965	8 23 53.6	84.76	23 0
28	13 23 9.16	4.374	7 52 33.3	71.69	22 55
29	13 21 44.16	2.701	7 26 41.6	57.48	22 50
30	13 20 59.69	− 1.005	7 6 39.1	42.69	22 46
31	13 20 55.73	+ 0.667	− 6 52 33.1	+ 27.85	22 42
32	13 21 31.21	+ 2.276	− 6 44 19.3	+ 13.40	22 40

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″
Semidiameter	3.72	4.13	4.59	4.95	4.96	4.5
Horizontal Parallax	9.82	10.87	12.06	13.02	13.06	11.8

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.					
Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.	Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	13 21 31.21	+ 2.276	− 6 44 19.3	+13.40	22 40.2	1	15 52 10.86	+16.060	−20 0 8.8	−66.58	23 17.5
2	13 22 44.25	3.793	6 41 44.2	− 0.33	22 38.0	2	15 58 37.39	16.150	20 26 18.6	64.23	23 20.1
3	13 24 32.39	5.198	6 44 27.5	13.10	22 36.4	3	16 5 6.05	16.238	20 51 31.1	61.80	23 22.7
4	13 26 52.82	6.483	6 52 4.2	24.77	22 35.2	4	16 11 36.83	16.326	21 15 44.4	59.29	23 25.3
5	13 29 42.58	7.641	7 4 6.9	35.25	22 34.5	5	16 18 9.70	16.412	21 38 56.7	56.71	23 27.9
6	13 32 58.64	+ 8.677	− 7 20 6.8	−44.54	22 34.2	6	16 24 44.63	+16.498	−22 1 6.2	−54.06	23 30.6
7	13 36 38.11	9.593	7 39 35.1	52.64	22 34.3	7	16 31 21.61	16.583	22 22 11.2	51.34	23 33.3
8	13 40 38.24	10.400	8 2 4.3	59.61	22 34.6	8	16 38 0.62	16.667	22 42 10.2	48.56	23 36.1
9	13 44 56.48	11.105	8 27 8.2	65.54	22 35.2	9	16 44 41.63	16.750	23 1 1.6	45.71	23 38.9
0	13 49 30.55	11.719	8 54 22.6	70.50	22 36.0	10	16 51 24.61	16.831	23 18 43.8	42.80	23 41.7
1	13 54 18.38	+12.254	− 9 23 25.2	−74.57	22 37.1	11	16 58 9.53	+16.911	−23 35 15.5	−39.83	23 44.5
2	13 59 18.18	12.718	9 53 56.0	77.87	22 38.3	12	17 4 56.35	16.990	23 50 35.1	36.80	23 47.4
3	14 4 28.37	13.121	10 25 37.2	80.45	22 39.7	13	17 11 45.04	17.067	24 4 41.2	33.71	23 50.3
4	14 9 47.58	13.471	10 58 12.6	82.40	22 41.2	14	17 18 35.55	17.142	24 17 32.5	30.56	23 53.2
5	14 15 14.63	13.776	11 31 28.1	83.80	22 42.8	15	17 25 27.83	17.214	24 29 7.5	27.35	23 56.2
6	14 20 48.53	+14.043	−12 5 11.2	−84.71	22 44.5	16	17 32 21.82	+17.284	−24 39 24.8	−24.09	23 59.2
7	14 26 28.44	14.278	12 39 10.9	85.19	22 46.3	17	17 39 17.44	17.350	24 48 23.2	20.77	. . . . .
8	14 32 13.65	14.485	13 13 17.4	85.29	22 48.2	18	17 46 14.62	17.414	24 56 1.2	17.39	0 2.2
9	14 38 3.55	14.670	13 47 22.2	85.06	22 50.2	19	17 53 13.29	17.474	25 2 17.6	13.97	0 5.2
0	14 43 57.64	14.835	14 21 17.9	84.53	22 52.2	20	18 0 13.34	17.529	25 7 11.1	10.48	0 8.3
1	14 49 55.51	+14.985	−14 54 57.7	−83.75	22 54.3	21	18 7 14.65	+17.580	−25 10 40.4	− 6.95	0 11.4
2	14 55 56.82	15.122	15 28 15.9	82.73	22 56.4	22	18 14 17.11	17.625	25 12 44.4	− 3.37	0 14.5
3	15 2 1.30	15.250	16 1 7.2	81.52	22 58.6	23	18 21 20.59	17.664	25 13 21.7	+ 0.26	0 17.6
4	15 8 8.71	15.367	16 33 27.2	80.12	23 0.8	24	18 28 24.95	17.698	25 12 31.3	3.94	0 20.7
5	15 14 18.86	15.478	17 5 11.6	78.55	23 3.1	25	18 35 30.02	17.723	25 10 12.1	7.66	0 23.8
26	15 20 31.60	+15.583	−17 36 16.8	−76.85	23 5.4	26	18 42 35.62	+17.742	−25 6 23.0	+11.43	0 27.0
27	15 26 46.82	15.684	18 6 39.4	75.02	23 7.8	27	18 49 41.56	17.752	25 1 3.0	15.23	0 30.2
28	15 33 4.42	15.782	18 36 16.7	73.07	23 10.2	28	18 56 47.63	17.753	24 54 11.3	19.07	0 33.3
29	15 39 24.33	15.877	19 5 5.6	71.00	23 12.6	29	19 3 53.59	17.743	24 45 47.1	22.95	0 36.5
30	15 45 46.49	15.970	19 33 3.7	68.84	23 15.0	30	19 10 59.17	17.721	24 35 49.6	26.85	0 39.7
31	15 52 10.86	+16.060	−20 0 8.8	−66.58	23 17.5	31	19 18 4.10	+17.687	−24 24 18.4	+30.76	0 42.9
32	15 58 37.39	+16.150	−20 26 18.6	−64.23	23 20.1	32	19 25 8.05	+17.640	−24 11 13.2	+34.68	0 46.0

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
	″	″	″	″	″	″		″	″	″	″	″	″	″
Semidiameter	3.89	3.36	2.99	2.73	2.56	2.45	Semidiameter . . .	2.38	2.33	2.30	2.30	2.33	2.39	2.47
Horizontal Parallax . . .	10.25	8.86	7.87	7.20	6.75	6.45	Horizontal Parallax	6.25	6.13	6.07	6.08	6.15	6.29	6.51

NOTE.—The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; the sign − indicates that north declinations are decreasing or south declinations increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	15 57 56.26	+ 5.089	−16 8 29.3	− 7.40	21 16.1
2	16 0 1.55	5.350	16 11 44.0	8.81	21 14.3
3	16 2 13.02	5.604	16 15 31.4	10.12	21 12.7
4	16 4 30.47	5.849	16 19 49.2	11.34	21 11.1
5	16 6 53.70	6.086	16 24 35.0	12.46	21 9.6
6	16 9 22.54	+ 6.316	−16 29 46.5	−13.49	21 8.2
7	16 11 56.80	6.538	16 35 21.5	14.42	21 6.9
8	16 14 36.30	6.753	16 41 17.8	15.26	21 5.7
9	16 17 20.86	6.960	16 47 33.2	16.01	21 4.6
10	16 20 10.31	7.160	16 54 5.7	16.68	21 3.5
11	16 23 4.48	+ 7.353	−17 0 53.2	−17.26	21 2.6
12	16 26 3.22	7.540	17 7 53.6	17.76	21 1.7
13	16 29 6.36	7.721	17 15 5.0	18.18	21 0.9
14	16 32 13.77	7.895	17 22 25.5	18.52	21 0.1
15	16 35 25.28	8.063	17 29 53.3	18.79	20 59.4
16	16 38 40.77	+ 8.226	−17 37 26.8	−18.99	20 58.8
17	16 42 0.11	8.384	17 45 4.2	19.12	20 58.2
18	16 45 23.17	8.537	17 52 43.8	19.18	20 57.7
19	16 48 49.83	8.685	18 0 24.1	19.18	20 57.3
20	16 52 19.99	8.828	18 8 3.6	19.11	20 56.9
21	16 55 53.55	+ 8.967	−18 15 40.7	−18.97	20 56.6
22	16 59 30.40	9.102	18 23 13.9	18.78	20 56.3
23	17 3 10.44	9.234	18 30 41.8	18.53	20 56.0
24	17 6 53.58	9.361	18 38 3.1	18.23	20 55.8
25	17 10 39.72	9.484	18 45 16.4	17.87	20 55.7
26	17 14 28.79	+ 9.604	−18 52 20.5	−17.46	20 55.6
27	17 18 20.69	9.720	18 59 14.0	16.99	20 55.6
28	17 22 15.34	9.833	19 5 55.8	16.48	20 55.6
29	17 26 12.66	9.943	19 12 24.6	15.92	20 55.6
30	17 30 12.57	10.049	19 18 39.3	15.30	20 55.7
31	17 34 14.98	+10.152	−19 24 38.7	−14.64	20 55.8
32	17 38 19.81	+10.251	−19 30 21.8	−13.94	20 56.0

Day of Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter	21.11	19.47	18.01	16.72	15.58	14.58	13.69
Hor. Parallax	21.74	20.05	18.55	17.22	16.05	15.02	14.10

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	17 38 19.81	+10.251	−19 30 21.8	−13.94	20 56.0
2	17 42 27.00	10.347	19 35 47.5	13.19	20 56.2
3	17 46 36.46	10.440	19 40 54.7	12.40	20 56.5
4	17 50 48.10	10.530	19 45 42.5	11.58	20 56.8
5	17 55 1.85	10.616	19 50 10.0	10.71	20 57.1
6	17 59 17.63	+10.699	−19 54 16.2	− 9.80	20 57.4
7	18 3 35.36	10.778	19 58 0.2	8.86	20 57.8
8	18 7 54.95	10.854	20 1 21.3	7.89	20 58.2
9	18 12 16.31	10.926	20 4 18.8	6.89	20 58.7
10	18 16 39.36	10.995	20 6 51.8	5.85	20 59.2
11	18 21 4.03	+11.061	−20 8 59.6	− 4.79	20 59.6
12	18 25 30.24	11.123	20 10 41.6	3.71	21 0.1
13	18 29 57.91	11.182	20 11 57.3	2.60	21 0.7
14	18 34 26.95	11.237	20 12 46.0	1.46	21 1.3
15	18 38 57.27	11.289	20 13 7.3	− 0.30	21 1.8
16	18 43 28.81	+11.339	−20 13 0.6	+ 0.87	21 2.4
17	18 48 1.52	11.386	20 12 25.5	2.06	21 3.0
18	18 52 35.31	11.430	20 11 21.5	3.27	21 3.6
19	18 57 10.12	11.470	20 9 48.3	4.50	21 4.3
20	19 1 45.87	11.508	20 7 45.6	5.74	21 5.0
21	19 6 22.50	+11.544	−20 5 13.0	+ 6.99	21 5.7
22	19 10 59.95	11.577	20 2 10.1	8.25	21 6.4
23	19 15 38.16	11.607	19 58 36.8	9.53	21 7.1
24	19 20 17.05	11.634	19 54 32.7	10.81	21 7.8
25	19 24 56.58	11.659	19 49 57.7	12.11	21 8.5
26	19 29 36.68	+11.682	−19 44 51.5	+13.41	21 9.2
27	19 34 17.30	11.702	19 39 14.1	14.71	21 10.0
28	19 38 58.38	11.720	19 33 5.3	16.02	21 10.8
29	19 43 39.86	11.736	19 26 25.0	17.33	21 11.5
30	19 48 21.70	11.750	19 19 13.2	18.64	21 12.2
31	19 53 3.84	+11.761	−19 11 29.8	+19.96	21 13.0
32	19 57 46.22	+11.770	−19 3 14.9	+21.28	21 13.8

Day of the Month.	5th.	10th.	15th.	20th.	25th.
	″	″	″	″	″
Semidiameter	12.90	12.20	11.56	10.99	10.48
Horizontal Parallax . . .	13.29	12.56	11.90	11.32	10.79

Note.—The sign + indicates north declinations; the sign − indicates south declinations.

VENUS, 1915.

GREENWICH MEAN TIME.

MARCH.

	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
	19 43 39.86	+11.736	−19 26 25.0	+17.33	21 11.5
	19 48 21.70	11.750	19 19 13.2	18.64	21 12.2
	19 53 3.84	11.761	19 11 29.8	19.96	21 13.0
	19 57 46.22	11.770	19 3 14.9	21.28	21 13.8
	20 2 28.80	11.777	18 54 28.4	22.59	21 14.5
6	20 7 11.52	+11.782	−18 45 10.4	+23.90	21 15.3
7	20 11 54.32	11.785	18 35 21.1	25.20	21 16.1
8	20 16 37.16	11.785	18 25 0.5	26.50	21 16.8
9	20 21 19.99	11.783	18 14 9.0	27.79	21 17.5
0	20 26 2.76	11.780	18 2 46.6	29.07	21 18.3
1	20 30 45.42	+11.775	−17 50 53.6	+30.34	21 19.2
2	20 35 27.93	11.768	17 38 30.3	31.60	21 20.0
3	20 40 10.24	11.758	17 25 37.0	32.84	21 20.7
4	20 44 52.31	11.747	17 12 14.0	34.07	21 21.4
5	20 49 34.10	11.735	16 58 21.6	35.29	21 22.2
6	20 54 15.58	+11.722	−16 44 0.1	+36.49	21 23.0
7	20 58 56.73	11.707	16 29 9.9	37.68	21 23.7
8	21 3 37.51	11.691	16 13 51.5	38.85	21 24.4
9	21 8 17.89	11.674	15 58 5.2	40.00	21 25.1
0	21 12 57.84	11.656	15 41 51.5	41.13	21 25.8
1	21 17 37.35	+11.637	−15 25 10.8	+42.25	21 26.6
2	21 22 16.40	11.617	15 8 3.5	43.35	21 27.3
3	21 26 54.96	11.596	14 50 30.1	44.43	21 28.0
4	21 31 33.03	11.576	14 32 30.9	45.49	21 28.7
5	21 36 10.60	11.555	14 14 6.5	46.53	21 29.3
6	21 40 47.65	+11.533	−13 55 17.4	+47.55	21 30.0
7	21 45 24.18	11.511	13 36 4.0	48.55	21 30.7
28	21 50 0.18	11.489	13 16 26.9	49.53	21 31.4
29	21 54 35.65	11.467	12 56 26.6	50.49	21 32.0
30	21 59 10.60	11.445	12 36 3.5	51.43	21 32.6
31	22 3 45.03	+11.423	−12 15 18.3	+52.34	21 33.2
32	22 8 18.92	+11.401	−11 54 11.3	+53.23	21 33.8

APRIL.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	22 8 18.92	+11.401	−11 54 11.3	+53.23	21 33.8
2	22 12 52.29	11.380	11 32 43.2	54.10	21 34.4
3	22 17 25.15	11.359	11 10 54.5	54.95	21 35.0
4	22 21 57.50	11.337	10 48 45.9	55.77	21 35.6
5	22 26 29.34	11.316	10 26 17.8	56.57	21 36.2
6	22 31 0.68	+11.295	−10 3 30.9	+57.34	21 36.8
7	22 35 31.53	11.275	9 40 25.8	58.08	21 37.4
8	22 40 1.90	11.255	9 17 3.2	58.80	21 37.9
9	22 44 31.79	11.236	8 53 23.6	59.49	21 38.4
10	22 49 1.22	11.217	8 29 27.8	60.15	21 39.0
11	22 53 30.19	+11.198	− 8 5 16.3	+60.80	21 39.5
12	22 57 58.72	11.180	7 40 49.8	61.41	21 40.0
13	23 2 26.82	11.163	7 16 8.9	61.99	21 40.5
14	23 6 54.52	11.146	6 51 14.3	62.55	21 41.1
15	23 11 21.83	11.130	6 26 6.7	63.08	21 41.6
16	23 15 48.78	+11.115	− 6 0 46.6	+63.59	21 42.1
17	23 20 15.37	11.101	5 35 14.7	64.07	21 42.6
18	23 24 41.63	11.088	5 9 31.7	64.52	21 43.1
19	23 29 7.60	11.076	4 43 38.1	64.94	21 43.6
20	23 33 33.28	11.065	4 17 34.7	65.34	21 44.1
21	23 37 58.71	+11.055	− 3 51 22.0	+65.71	21 44.6
22	23 42 23.91	11.046	3 25 0.7	66.06	21 45.0
23	23 46 48.91	11.038	2 58 31.5	66.38	21 45.4
24	23 51 13.74	11.032	2 31 54.9	66.67	21 45.9
25	23 55 38.43	11.027	2 5 11.6	66.94	21 46.4
26	0 0 3.02	+11.023	− 1 38 22.2	+67.18	21 46.8
27	0 4 27.54	11.021	1 11 27.3	67.39	21 47.3
28	0 8 52.02	11.020	0 44 27.5	67.58	21 47.8
29	0 13 16.49	11.020	− 0 17 23.5	67.75	21 48.3
30	0 17 40.98	11.022	+ 0 9 44.1	67.88	21 48.7
31	0 22 5.54	+11.025	+ 0 36 54.7	+67.99	21 49.1
32	0 26 30.20	+11.030	+ 1 4 7.6	+68.07	21 49.6

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter.	10.01	9.58	9.20	8.85	8.53	8.23
Horizontal Parallax . . .	10.31	9.87	9.47	9.11	8.78	8.47

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
	″	″	″	″	″	″
Semidiameter.	7.95	7.70	7.47	7.25	7.05	6.87
Horizontal Parallax . . .	8.19	7.93	7.69	7.47	7.27	7.08

NOTE.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations decreasing. The sign − indicates that south declinations are increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	0 22 5.54	+11.025	+ 0 36 54.7	+67.99	21 49.1
2	0 26 30.20	11.030	1 4 7.6	68.07	21 49.6
3	0 30 54.98	11.036	1 31 22.1	68.13	21 50.1
4	0 35 19.92	11.043	1 58 37.7	68.16	21 50.6
5	0 39 45.06	11.052	2 25 53.6	68.16	21 51.1
6	0 44 10.43	+11.062	+ 2 53 9.1	+68.13	21 51.6
7	0 48 36.06	11.073	3 20 23.7	68.07	21 52.1
8	0 53 1.97	11.086	3 47 36.6	67.99	21 52.6
9	0 57 28.20	11.100	4 14 47.1	67.88	21 53.1
10	1 1 54.78	11.115	4 41 54.5	67.74	21 53.6
11	1 6 21.74	+11.132	+ 5 8 58.2	+67.57	21 54.1
12	1 10 49.11	11.150	5 35 57.4	67.37	21 54.6
13	1 15 16.93	11.169	6 2 51.5	67.14	21 55.1
14	1 19 45.22	11.189	6 29 39.8	66.88	21 55.6
15	1 24 14.02	11.211	6 56 21.6	66.59	21 56.1
16	1 28 43.35	+11.234	+ 7 22 56.2	+66.28	21 56.7
17	1 33 13.24	11.258	7 49 23.0	65.94	21 57.3
18	1 37 43.73	11.283	8 15 41.2	65.57	21 57.9
19	1 42 14.84	11.310	8 41 50.2	65.17	21 58.5
20	1 46 46.61	11.338	9 7 49.2	64.74	21 59.1
21	1 51 19.08	+11.368	+ 9 33 37.6	+64.29	21 59.7
22	1 55 52.27	11.399	9 59 14.8	63.81	22 0.3
23	2 0 26.20	11.430	10 24 40.1	63.30	22 0.9
24	2 5 0.90	11.462	10 49 52.8	62.76	22 1.6
25	2 9 36.40	11.496	11 14 52.1	62.19	22 2.3
26	2 14 12.74	+11.532	+11 39 37.5	+61.59	22 2.9
27	2 18 49.95	11.569	12 4 8.2	60.96	22 3.6
28	2 23 28.05	11.607	12 28 23.6	60.31	22 4.3
29	2 28 7.08	11.646	12 52 23.0	59.63	22 5.0
30	2 32 47.05	11.685	13 16 5.6	58.92	22 5.8
31	2 37 27.99	+11.726	+13 39 30.8	+58.18	22 6.6
32	2 42 9.92	+11.768	+14 2 37.9	+57.41	22 7.3

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter	6.70	6.54	6.39	6.25	6.12	6.00	5.89
Horizontal Parallax	6.90	6.73	6.58	6.44	6.31	6.18	6.07

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	2 42 9.92	+11.768	+14 2 37.9	+57.41	22 7.3
2	2 46 52.87	11.811	14 25 26.2	56.61	22 8.1
3	2 51 36.85	11.854	14 47 55.0	55.78	22 8.9
4	2 56 21.88	11.898	15 10 3.5	54.92	22 9.7
5	3 1 7.97	11.943	15 31 51.0	54.03	22 10.6
6	3 5 55.14	+11.988	+15 53 16.9	+53.12	22 11.5
7	3 10 43.40	12.033	16 14 20.4	52.17	22 12.3
8	3 15 32.75	12.079	16 35 0.8	51.19	22 13.2
9	3 20 23.20	12.125	16 55 17.3	50.18	22 14.1
10	3 25 14.76	12.171	17 15 9.3	49.14	22 15.0
11	3 30 7.43	+12.218	+17 34 36.1	+48.08	22 16.0
12	3 35 1.22	12.264	17 53 37.1	46.99	22 17.0
13	3 39 56.11	12.310	18 12 11.5	45.87	22 18.0
14	3 44 52.11	12.356	18 30 18.6	44.72	22 19.0
15	3 49 49.22	12.402	18 47 57.8	43.54	22 20.0
16	3 54 47.43	+12.448	+19 5 8.3	+42.34	22 21.1
17	3 59 46.73	12.494	19 21 49.7	41.11	22 22.2
18	4 4 47.12	12.539	19 38 1.2	39.85	22 23.2
19	4 9 48.58	12.583	19 53 42.2	38.56	22 24.3
20	4 14 51.09	12.627	20 8 52.1	37.25	22 25.4
21	4 19 54.64	+12.670	+20 23 30.3	+35.92	22 26.6
22	4 24 59.22	12.712	20 37 36.2	34.57	22 27.8
23	4 30 4.81	12.753	20 51 9.3	33.19	22 28.9
24	4 35 11.39	12.794	21 4 8.9	31.78	22 30.1
25	4 40 18.93	12.834	21 16 34.5	30.35	22 31.3
26	4 45 27.42	+12.873	+21 28 25.6	+28.90	22 32.5
27	4 50 36.83	12.911	21 39 41.6	27.43	22 33.7
28	4 55 47.13	12.947	21 50 22.1	25.94	22 34.9
29	5 0 58.29	12.982	22 0 26.5	24.43	22 36.2
30	5 6 10.28	13.016	22 9 54.4	22.90	22 37.5
31	5 11 23.07	+13.049	+22 18 45.4	+21.35	22 38.8
32	5 16 36.62	+13.080	+22 26 58.9	+19.78	22 40.1

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter	5.79	5.69	5.60	5.52	5.45	5.38
Horizontal Parallax . . .	5.96	5.86	5.77	5.69	5.61	5.54

NOTE.—The sign + indicates north declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	5 11 23.07	+13.049	+22 18 45.4	+21.35	22 38.8
2	5 16 36.62	13.080	22 26 58.9	19.78	22 40.1
3	5 21 50.88	13.108	22 34 34.6	18.19	22 41.4
4	5 27 5.81	13.135	22 41 32.0	16.59	22 42.7
5	5 32 21.37	13.161	22 47 50.9	14.98	22 44.0
6	5 37 37.52	+13.184	+22 53 30.9	+13.35	22 45.3
7	5 42 54.20	13.205	22 58 31.6	11.70	22 46.7
8	5 48 11.35	13.223	23 2 52.6	10.05	22 48.1
9	5 53 28.92	13.240	23 6 33.9	8.39	22 49.4
10	5 58 46.88	13.255	23 9 35.2	6.72	22 50.7
11	6 4 5.17	+13.268	+23 11 56.3	+ 5.04	22 52.1
12	6 9 23.72	13.278	23 13 36.9	3.35	22 53.5
13	6 14 42.49	13.286	23 14 37.0	+ 1.66	22 54.9
14	6 20 1.41	13.291	23 14 56.4	− 0.04	22 56.3
15	6 25 20.44	13.294	23 14 35.1	1.74	22 57.6
16	6 30 39.51	+13.295	+23 13 33.0	− 3.44	22 59.0
17	6 35 58.57	13.293	23 11 50.0	5.14	23 0.4
18	6 41 17.56	13.289	23 9 26.2	6.84	23 1.8
19	6 46 36.43	13.283	23 6 21.7	8.54	23 3.1
20	6 51 55.13	13.275	23 2 36.5	10.23	23 4.4
21	6 57 13.60	+13.264	+22 58 10.6	−11.92	23 5.8
22	7 2 31.79	13.252	22 53 4.2	13.60	23 7.2
23	7 7 49.66	13.237	22 47 17.5	15.28	23 8.5
24	7 13 7.15	13.220	22 40 50.6	16.96	23 9.8
25	7 18 24.21	13.201	22 33 43.6	18.62	23 11.2
26	7 23 40.80	+13.181	+22 25 56.9	−20.27	23 12.6
27	7 28 56.89	13.159	22 17 30.7	21.91	23 13.9
28	7 34 12.42	13.135	22 8 25.2	23.54	23 15.2
29	7 39 27.36	13.110	21 58 40.7	25.16	23 16.5
30	7 44 41.66	13.082	21 48 17.6	26.76	23 17.8
31	7 49 55.28	+13.053	+21 37 16.2	−28.35	23 19.0
32	7 55 8.19	+13.022	+21 25 36.8	−29.92	23 20.2

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter	5.32	5.26	5.21	5.17	5.13	5.09
Horizontal Parallax . . .	5.48	5.42	5.37	5.32	5.28	5.24

AUGUST.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	7 55 8.19	+13.022	+21 25 36.8	−29.92	23 20.2
2	8 0 20.34	12.990	21 13 19.9	31.48	23 21.5
3	8 5 31.71	12.957	21 0 25.9	33.02	23 22.8
4	8 10 42.27	12.922	20 46 55.2	34.54	23 24.0
5	8 15 51.97	12.886	20 32 48.3	36.03	23 25.2
6	8 21 0.79	+12.849	+20 18 5.7	−37.51	23 26.4
7	8 26 8.71	12.811	20 2 47.9	38.97	23 27.6
8	8 31 15.71	12.772	19 46 55.4	40.40	23 28.7
9	8 36 21.75	12.732	19 30 28.8	41.81	23 29.8
10	8 41 26.82	12.691	19 13 28.6	43.20	23 31.0
11	8 46 30.89	+12.649	+18 55 55.4	−44.56	23 32.1
12	8 51 33.96	12.606	18 37 49.9	45.90	23 33.2
13	8 56 36.00	12.563	18 19 12.6	47.21	23 34.3
14	9 1 37.01	12.520	18 0 4.2	48.49	23 35.4
15	9 6 36.98	12.477	17 40 25.2	49.75	23 36.4
16	9 11 35.90	+12.433	+17 20 16.4	−50.98	23 37.4
17	9 16 33.77	12.389	16 59 38.4	52.18	23 38.4
18	9 21 30.60	12.345	16 38 31.8	53.36	23 39.4
19	9 26 26.37	12.302	16 16 57.3	54.51	23 40.4
20	9 31 21.09	12.259	15 54 55.6	55.63	23 41.3
21	9 36 14.78	+12.216	+15 32 27.4	−56.72	23 42.2
22	9 41 7.44	12.173	15 9 33.3	57.78	23 43.2
23	9 45 59.08	12.131	14 46 14.0	58.82	23 44.1
24	9 50 49.72	12.090	14 22 30.1	59.83	23 45.0
25	9 55 39.38	12.049	13 58 22.4	60.81	23 45.9
26	10 0 28.07	+12.009	+13 33 51.5	−61.76	23 46.7
27	10 5 15.81	11.970	13 8 58.2	62.68	23 47.5
28	10 10 2.62	11.932	12 43 43.1	63.57	23 48.4
29	10 14 48.52	11.894	12 18 7.0	64.43	23 49.2
30	10 19 33.53	11.857	11 52 10.5	65.26	23 50.0
31	10 24 17.68	+11.822	+11 25 54.3	−66.07	23 50.8
32	10 29 1.00	+11.788	+10 59 19.2	−66.85	23 51.5

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
	″	″	″	″	″	″
Semidiameter	5.06	5.03	5.00	4.98	4.97	4.96
Horizontal Parallax . . .	5.21	5.18	5.15	5.13	5.12	5.11

NOTE.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

VENUS, 1915.

GREENWICH MEAN TIME.

SEPTEMBER.						OCTOBER.					
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	10 29 1.00	+11.788	+10 59 19.2	−66.85	23 51.5	1	12 46 51.05	+11.426	− 3 44 5.9	−75.82	0 10.3
2	10 33 43.50	11.754	10 32 25.9	67.59	23 52.2	2	12 51 25.43	11.440	4 14 23.4	75.64	0 10.9
3	10 38 25.22	11.722	10 5 15.2	68.30	23 53.0	3	12 56 0.18	11.456	4 44 36.3	75.43	0 11.5
4	10 43 6.18	11.691	9 37 47.7	68.98	23 53.7	4	13 0 35.34	11.474	5 14 43.9	75.19	0 12.2
5	10 47 46.42	11.662	9 10 4.2	69.63	23 54.4	5	13 5 10.95	11.494	5 44 45.4	74.92	0 12.9
6	10 52 25.96	+11.634	+ 8 42 5.5	−70.25	23 55.1	6	13 9 47.05	+11.515	− 6 14 40.0	−74.62	0 13.5
7	10 57 4.83	11.607	8 13 52.2	70.84	23 55.8	7	13 14 23.68	11.538	6 44 27.0	74.29	0 14.2
8	11 1 43.07	11.581	7 45 25.1	71.40	23 56.5	8	13 19 0.87	11.562	7 14 5.5	73.92	0 14.9
9	11 6 20.71	11.556	7 16 45.0	71.93	23 57.2	9	13 23 38.67	11.588	7 43 34.9	73.52	0 15.6
10	11 10 57.77	11.533	6 47 52.6	72.43	23 57.9	10	13 28 17.12	11.616	8 12 54.3	73.09	0 16.3
11	11 15 34.30	+11.511	+ 6 18 48.6	−72.90	23 58.5	11	13 32 56.25	+11.645	− 8 42 2.9	−72.62	0 17.0
12	11 20 10.32	11.491	5 49 33.8	73.33	23 59.1	12	13 37 36.09	11.675	9 10 59.9	72.12	0 17.7
13	11 24 45.88	11.472	5 20 9.0	73.73	23 59.8	13	13 42 16.67	11.707	9 39 44.5	71.59	0 18.4
14	11 29 21.00	11.455	4 50 34.9	74.10	. . . . .	14	13 46 58.04	11.741	10 8 15.9	71.03	0 19.2
15	11 33 55.73	11.439	4 20 52.2	74.45	0 0.5	15	13 51 40.23	11.776	10 36 33.4	70.43	0 20.0
16	11 38 30.10	+11.425	+ 3 51 1.6	−74.76	0 1.1	16	13 56 23.27	+11.812	−11 4 36.2	−69.80	0 20.7
17	11 43 4.15	11.413	3 21 3.9	75.04	0 1.7	17	14 1 7.20	11.849	11 32 23.5	69.14	0 21.5
18	11 47 37.92	11.402	2 50 59.8	75.29	0 2.3	18	14 5 52.04	11.888	11 59 54.5	68.44	0 22.3
19	11 52 11.46	11.393	2 20 50.1	75.51	0 2.9	19	14 10 37.83	11.928	12 27 8.4	67.71	0 23.1
20	11 56 44.80	11.385	1 50 35.5	75.70	0 3.6	20	14 15 24.61	11.970	12 54 4.5	66.95	0 24.0
21	12 1 17.98	+11.380	+ 1 20 16.6	−75.86	0 4.2	21	14 20 12.40	+12.013	−13 20 41.9	−66.16	0 24.9
22	12 5 51.05	11.377	0 49 54.2	76.00	0 4.8	22	14 25 1.23	12.057	13 46 59.9	65.34	0 25.7
23	12 10 24.07	11.375	+ 0 19 29.0	76.10	0 5.4	23	14 29 51.12	12.102	14 12 57.7	64.48	0 26.6
24	12 14 57.06	11.375	− 0 10 58.3	76.17	0 6.0	24	14 34 42.12	12.148	14 38 34.5	63.58	0 27.5
25	12 19 30.08	11.377	0 41 26.9	76.21	0 6.6	25	14 39 34.24	12.195	15 3 49.4	62.65	0 28.4
26	12 24 3.16	+11.380	− 1 11 56.1	−76.22	0 7.2	26	14 44 27.50	+12.243	−15 28 41.7	−61.70	0 29.4
27	12 28 36.34	11.385	1 42 25.2	76.20	0 7.8	27	14 49 21.93	12.292	15 53 10.7	60.71	0 30.4
28	12 33 9.68	11.393	2 12 53.5	76.15	0 8.5	28	14 54 17.55	12.342	16 17 15.4	59.68	0 31.3
29	12 37 43.22	11.402	2 43 20.2	76.07	0 9.1	29	14 59 14.37	12.392	16 40 55.1	58.62	0 32.3
30	12 42 16.99	11.413	3 13 44.6	75.96	0 9.7	30	15 4 12.40	12.443	17 4 9.1	57.53	0 33.3
31	12 46 51.05	+11.426	− 3 44 5.9	−75.82	0 10.3	31	15 9 11.66	+12.495	−17 26 56.6	−56.41	0 34.4
32	12 51 25.43	+11.440	− 4 14 23.4	−75.64	0 10.9	32	15 14 12.17	+12.547	−17 49 16.6	−55.25	0 35.5

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.	Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th.
	″	″	″	″	″	″		″	″	″	″	″	″
Semidiameter	4.95	4.95	4.95	4.96	4.97	4.98	Semidiameter	4.99	5.01	5.04	5.07	5.10	5.13
Horizontal Parallax . . .	5.10	5.10	5.10	5.11	5.12	5.13	Horizontal Parallax . . .	5.14	5.16	5.19	5.22	5.25	5.28

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

	NOVEMBER.						DECEMBER.				
Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	15 14 12.17	+12.547	−17 49 16.6	−55.25	0 35.5	1	17 52 59.92	+13.706	−24 27 47.2	− 7.59	1 16.0
2	15 19 13.92	12.599	18 11 8.4	54.06	0 36.6	2	17 58 28.97	13.715	24 30 26.8	5.71	1 17.5
3	15 24 16.92	12.651	18 32 31.2	52.83	0 37.7	3	18 3 58.21	13.721	24 32 21.4	3.83	1 19.1
4	15 29 21.18	12.704	18 53 24.3	51.58	0 38.8	4	18 9 27.56	13.724	24 33 30.7	1.95	1 20.7
5	15 34 26.70	12.756	19 13 46.9	50.30	0 40.0	5	18 14 56.95	13.724	24 33 54.7	− 0.06	1 22.2
6	15 39 33.47	+12.808	−19 33 38.2	−48.98	0 41.2	6	18 20 26.31	+13.722	−24 33 33.4	+ 1.83	1 23.7
7	15 44 41.48	12.859	19 52 57.4	47.62	0 42.3	7	18 25 55.57	13.717	24 32 26.8	3.72	1 25.3
8	15 49 50.72	12.910	20 11 43.7	46.23	0 43.5	8	18 31 24.67	13.708	24 30 34.9	5.61	1 26.9
9	15 55 1.17	12.960	20 29 56.4	44.82	0 44.7	9	18 36 53.52	13.696	24 27 57.7	7.49	1 28.4
10	16 0 12.83	13.010	20 47 34.9	43.38	0 46.0	10	18 42 22.06	13.682	24 24 35.5	9.36	1 29.9
11	16 5 25.67	+13.059	−21 4 38.3	−41.90	0 47.3	11	18 47 50.22	+13.664	−24 20 28.3	+11.23	1 31.4
12	16 10 39.66	13.107	21 21 6.0	40.40	0 48.6	12	18 53 17.93	13.644	24 15 36.4	13.09	1 32.9
13	16 15 54.79	13.154	21 36 57.3	38.87	0 49.9	13	18 58 45.12	13.621	24 9 59.9	14.95	1 34.5
14	16 21 11.03	13.199	21 52 11.6	37.31	0 51.2	14	19 4 11.73	13.595	24 3 39.0	16.79	1 36.0
15	16 26 28.35	13.244	22 6 48.1	35.73	0 52.6	15	19 9 37.69	13.567	23 56 34.1	18.62	1 37.5
16	16 31 46.72	+13.287	−22 20 46.3	−34.12	0 54.0	16	19 15 2.95	+13.537	−23 48 45.5	+20.43	1 39.0
17	16 37 6.11	13.328	22 34 5.6	32.49	0 55.3	17	19 20 27.46	13.504	23 40 13.6	22.23	1 40.4
18	16 42 26.47	13.368	22 46 45.4	30.83	0 56.7	18	19 25 51.15	13.469	23 30 58.7	24.01	1 41.8
19	16 47 47.77	13.407	22 58 45.1	29.15	0 58.1	19	19 31 13.96	13.432	23 21 1.2	25.77	1 43.3
20	16 53 9.98	13.444	23 10 4.3	27.45	0 59.5	20	19 36 35.86	13.393	23 10 21.5	27.52	1 44.7
21	16 58 33.05	+13.478	−23 20 42.3	−25.72	1 1.0	21	19 41 56.79	+13.351	−22 59 0.1	+29.25	1 46.1
22	17 3 56.93	13.511	23 30 38.7	23.98	1 2.5	22	19 47 16.71	13.308	22 46 57.5	30.96	1 47.5
23	17 9 21.58	13.542	23 39 53.1	22.22	1 3.9	23	19 52 35.57	13.263	22 34 14.1	32.65	1 48.9
24	17 14 46.94	13.571	23 48 25.0	20.44	1 5.4	24	19 57 53.33	13.216	22 20 50.5	34.31	1 50.3
25	17 20 12.97	13.598	23 56 13.9	18.64	1 6.9	25	20 3 9.95	13.168	22 6 47.3	35.95	1 51.6
26	17 25 39.61	+13.622	−24 3 19.5	−16.83	1 8.4	26	20 8 25.41	+13.119	−21 52 5.0	+37.57	1 52.9
27	17 31 6.80	13.644	24 9 41.6	15.00	1 9.9	27	20 13 39.67	13.069	21 36 44.2	39.16	1 54.2
28	17 36 34.49	13.663	24 15 19.7	13.16	1 11.4	28	20 18 52.70	13.017	21 20 45.5	40.72	1 55.5
29	17 42 2.61	13.680	24 20 13.4	11.31	1 13.0	29	20 24 4.48	12.964	21 4 9.5	42.26	1 56.7
30	17 47 31.11	13.694	24 24 22.7	9.46	1 14.5	30	20 29 14.98	12.910	20 46 57.0	43.77	1 57.9
31	17 52 59.92	+13.706	−24 27 47.2	− 7.59	1 16.0	31	20 34 24.17	+12.855	−20 29 8.5	+45.26	1 59.2
32	17 58 28.97	+13.715	−24 30 26.8	− 5.71	1 17.5	32	20 39 32.04	+12.800	−20 10 44.7	+46.71	2 0.4

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter	5.16	5.20	5.24	5.29	5.34	5.40
Horizontal Parallax . . .	5.32	5.36	5.40	5.45	5.50	5.56

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.	32d.
	″	″	″	″	″	″	″
Semidiameter . . .	5.46	5.52	5.59	5.66	5.74	5.83	5.92
Horizontal Parallax	5.62	5.69	5.76	5.83	5.91	6.00	6.10

NOTE.—The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; the sign − indicates that north declinations are decreasing or south declinations increasing.

MARS, 1915.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	18 34 20.70	+8.328	−24 1 46.2	+ 5.68	23 53.5
2	18 37 40.60	8.330	23 59 22.0	6.35	23 52.9
3	18 41 0.56	8.332	23 56 41.6	7.02	23 52.3
4	18 44 20.54	8.333	23 53 45.2	7.69	23 51.7
5	18 47 40.55	8.334	23 50 32.7	8.35	23 51.1
6	18 51 0.58	+8.334	−23 47 4.3	+ 9.02	23 50.5
7	18 54 20.60	8.334	23 43 19.8	9.69	23 49.9
8	18 57 40.61	8.333	23 39 19.3	10.35	23 49.3
9	19 1 0.59	8.331	23 35 2.8	11.02	23 48.6
10	19 4 20.52	8.329	23 30 30.3	11.69	23 48.0
11	19 7 40.38	+8.326	−23 25 41.9	+12.35	23 47.4
12	19 11 0.17	8.322	23 20 37.7	13.00	23 46.8
13	19 14 19.85	8.317	23 15 17.6	13.66	23 46.2
14	19 17 39.41	8.312	23 9 41.8	14.31	23 45.6
15	19 20 58.85	8.307	23 3 50.3	14.96	23 44.9
16	19 24 18.14	+8.301	−22 57 43.2	+15.62	23 44.3
17	19 27 37.28	8.294	22 51 20.6	16.27	23 43.7
18	19 30 56.25	8.286	22 44 42.5	16.91	23 43.1
19	19 34 15.03	8.278	22 37 49.1	17.55	23 42.4
20	19 37 33.61	8.269	22 30 40.4	18.18	23 41.8
21	19 40 51.96	+8.260	−22 23 16.5	+18.81	23 41.2
22	19 44 10.09	8.250	22 15 37.5	19.44	23 40.5
23	19 47 27.97	8.240	22 7 43.6	20.06	23 39.9
24	19 50 45.61	8.229	21 59 34.9	20.68	23 39.2
25	19 54 2.98	8.218	21 51 11.3	21.29	23 38.6
26	19 57 20.09	+8.207	−21 42 33.1	+21.90	23 37.9
27	20 0 36.92	8.195	21 33 40.4	22.50	23 37.2
28	20 3 53.45	8.183	21 24 33.2	23.10	23 36.6
29	20 7 9.68	8.170	21 15 11.8	23.69	23 35.9
30	20 10 25.60	8.157	21 5 36.2	24.27	23 35.2
31	20 13 41.21	+8.144	−20 55 46.6	+24.85	23 34.5
32	20 16 56.49	+8.130	−20 45 43.1	+25.43	23 33.8

Day of the Month.	0	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″	″
Semidiameter	2.08	2.09	2.10	2.10	2.11	2.12	2.13
Horizontal Parallax	3.63	3.64	3.65	3.67	3.68	3.69	3.71

FEBRUARY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	20 16 56.49	+8.130	−20 45 43.1	+25.43	23 33.8
2	20 20 11.45	8.116	20 35 25.8	26.00	23 33.1
3	20 23 26.07	8.102	20 24 54.8	26.57	23 32.4
4	20 26 40.36	8.088	20 14 10.3	27.13	23 31.7
5	20 29 54.30	8.073	20 3 12.4	27.69	23 31.0
6	20 33 7.89	+8.059	−19 52 1.3	+28.24	23 30.3
7	20 36 21.13	8.044	19 40 37.1	28.78	23 29.5
8	20 39 34.00	8.029	19 29 0.0	29.31	23 28.8
9	20 42 46.50	8.013	19 17 10.2	29.84	23 28.1
10	20 45 58.62	7.997	19 5 7.8	30.36	23 27.3
11	20 49 10.36	+7.981	−18 52 52.9	+30.87	23 26.6
12	20 52 21.71	7.965	18 40 25.8	31.38	23 25.8
13	20 55 32.66	7.948	18 27 46.7	31.88	23 25.0
14	20 58 43.22	7.931	18 14 55.7	32.37	23 24.3
15	21 1 53.37	7.914	18 1 52.9	32.85	23 23.5
16	21 5 3.11	+7.897	−17 48 38.7	+33.32	23 22.7
17	21 8 12.44	7.880	17 35 13.3	33.79	23 21.9
18	21 11 21.35	7.863	17 21 36.7	34.25	23 21.1
19	21 14 29.84	7.845	17 7 49.2	34.70	23 20.3
20	21 17 37.91	7.827	16 53 51.0	35.15	23 19.5
21	21 20 45.55	+7.810	−16 39 42.2	+35.58	23 18.7
22	21 23 52.77	7.792	16 25 23.0	36.01	23 17.8
23	21 26 59.56	7.774	16 10 53.6	36.43	23 17.0
24	21 30 5.94	7.757	15 56 14.3	36.84	23 16.2
25	21 33 11.89	7.739	15 41 25.3	37.24	23 15.3
26	21 36 17.42	+7.722	−15 26 26.6	+37.64	23 14.5
27	21 39 22.53	7.704	15 11 18.5	38.03	23 13.6
28	21 42 27.22	7.687	14 56 1.1	38.41	23 12.7
29	21 45 31.51	7.670	14 40 34.7	38.78	23 11.8
30	21 48 35.40	7.654	14 24 59.5	39.15	23 11.0
31	21 51 38.88	+7.637	−14 9 15.6	+39.50	23 10.1
32	21 54 41.95	+7.620	−13 53 23.3	+39.85	23 9.2

Day of the Month.	4th.	9th.	14th.	19th.	24th.
	″	″	″	″	″
Semidiameter	2.14	2.15	2.15	2.16	2.17
Horizontal Parallax	3.72	3.74	3.75	3.77	3.79

NOTE.—The sign + indicates north declinations; the sign − indicates south declinations.

GREENWICH MEAN TIME.

MARCH.					Day of Month.	APRIL.				
Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.		Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
21 45 31.51	+7.670	−14 40 34.7	+38.78	23 11.8	1	23 17 41.16	+7.228	−5 45 26.6	+46.16	22 41.7
21 48 35.40	7.654	14 24 59.5	39.15	23 11.0	2	23 20 34.49	7.218	5 26 57.5	46.26	22 40.6
21 51 38.88	7.637	14 9 15.6	39.50	23 10.1	3	23 23 27.59	7.208	5 8 26.0	46.36	22 39.5
21 54 41.95	7.620	13 53 23.3	39.85	23 9.2	4	23 26 20.47	7.199	4 49 52.2	46.45	22 38.5
21 57 44.63	7.603	13 37 22.7	40.19	23 8.3	5	23 29 13.13	7.190	4 31 16.4	46.53	22 37.4
22 0 46.91	+7.587	−13 21 14.0	+40.53	23 7.4	6	23 32 5.57	+7.181	−4 12 38.8	+46.60	22 36.3
22 3 48.81	7.571	13 4 57.3	40.86	23 6.4	7	23 34 57.81	7.173	3 53 59.5	46.67	22 35.2
22 6 50.32	7.555	12 48 32.9	41.17	23 5.5	8	23 37 49.86	7.165	3 35 18.7	46.72	22 34.2
22 9 51.46	7.539	12 32 1.0	41.48	23 4.6	9	23 40 41.72	7.157	3 16 36.7	46.77	22 33.1
22 12 52.22	7.524	12 15 21.8	41.78	23 3.6	10	23 43 33.39	7.149	2 57 53.7	46.81	22 32.0
22 15 52.60	+7.508	−11 58 35.6	+42.07	23 2.7	11	23 46 24.89	+7.142	−2 39 9.8	+46.84	22 30.9
22 18 52.61	7.493	11 41 42.6	42.35	23 1.8	12	23 49 16.21	7.135	2 20 25.3	46.86	22 29.8
22 21 52.25	7.477	11 24 42.9	42.62	23 0.8	13	23 52 7.36	7.128	2 1 40.4	46.88	22 28.7
22 24 51.52	7.462	11 7 36.7	42.88	22 59.9	14	23 54 58.36	7.122	1 42 55.3	46.88	22 27.7
22 27 50.43	7.447	10 50 24.3	43.14	22 58.9	15	23 57 49.20	7.115	1 24 10.1	46.88	22 26.6
22 30 48.97	+7.432	−10 33 6.0	+43.38	22 57.9	16	0 0 39.90	+7.109	−1 5 25.1	+46.87	22 25.5
22 33 47.16	7.417	10 15 41.9	43.62	22 56.9	17	0 3 30.46	7.104	0 46 40.5	46.85	22 24.4
22 36 45.00	7.403	9 58 12.2	43.85	22 56.0	18	0 6 20.89	7.098	0 27 56.5	46.82	22 23.2
22 39 42.49	7.388	9 40 37.1	44.07	22 55.0	19	0 9 11.19	7.093	−0 9 13.2	46.78	22 22.1
22 42 39.64	7.374	9 22 56.9	44.28	22 54.0	20	0 12 1.36	7.088	+0 9 29.2	46.74	22 21.0
22 45 36.46	+7.361	− 9 5 11.8	+44.48	22 53.0	21	0 14 51.42	+7.084	+0 28 10.4	+46.69	22 19.9
22 48 32.95	7.347	8 47 22.0	44.67	22 52.0	22	0 17 41.38	7.080	0 46 50.3	46.63	22 18.8
22 51 29.11	7.334	8 29 27.6	44.85	22 51.0	23	0 20 31.24	7.076	1 5 28.8	46.57	22 17.7
22 54 24.96	7.321	8 11 28.9	45.03	22 49.9	24	0 23 21.02	7.072	1 24 5.6	46.49	22 16.6
22 57 20.49	7.308	7 53 26.0	45.20	22 48.9	25	0 26 10.72	7.069	1 42 40.5	46.41	22 15.5
23 0 15.72	+7.295	− 7 35 19.2	+45.36	22 47.9	26	0 29 0.34	+7.066	+2 1 13.4	+46.33	22 14.4
23 3 10.65	7.283	7 17 8.7	45.51	22 46.9	27	0 31 49.90	7.064	2 19 44.2	46.23	22 13.2
23 6 5.29	7.271	6 58 54.6	45.65	22 45.8	28	0 34 39.40	7.062	2 38 12.6	46.13	22 12.1
23 8 59.65	7.259	6 40 37.2	45.79	22 44.8	29	0 37 28.86	7.060	2 56 38.5	46.03	22 11.0
23 11 53.74	7.248	6 22 16.6	45.92	22 43.7	30	0 40 18.29	7.059	3 15 1.8	45.91	22 9.9
23 14 47.57	+7.238	− 6 3 53.0	+46.04	22 42.7	31	0 43 7.70	+7.058	+3 33 22.3	+45.79	22 8.8
23 17 41.16	+7.228	− 5 45 26.6	+46.16	22 41.7	32	0 45 57.09	+7.057	+3 51 39.9	+45.67	22 7.6

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter	2.18	2.19	2.20	2.21	2.22	2.23	2.24
Horizontal Parallax	3.80	3.82	3.84	3.85	3.87	3.89	3.91

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter	2.25	2.27	2.28	2.29	2.30	2.31
Horizontal Parallax . . .	3.93	3.95	3.97	3.99	4.01	4.03

NOTE.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing or south declinations decreasing.

MARS, 1915.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	0 43 7.70	+7.058	+ 3 33 22.3	+45.79	22 8.8
2	0 45 57.09	7.057	3 51 39.9	45.67	22 7.6
3	0 48 46.47	7.056	4 9 54.3	45.53	22 6.5
4	0 51 35.84	7.056	4 28 5.4	45.39	22 5.4
5	0 54 25.22	7.057	4 46 12.9	45.24	22 4.3
6	0 57 14.61	+7.058	+ 5 4 16.7	+45.08	22 3.2
7	1 0 4.01	7.059	5 22 16.6	44.91	22 2.1
8	1 2 53.44	7.060	5 40 12.6	44.74	22 0.9
9	1 5 42.90	7.061	5 58 4.3	44.56	21 59.8
10	1 8 32.39	7.062	6 15 51.6	44.38	21 58.7
11	1 11 21.91	+7.064	+ 6 33 34.4	+44.19	21 57.6
12	1 14 11.47	7.066	6 51 12.4	43.98	21 56.5
13	1 17 1.07	7.068	7 8 45.5	43.77	21 55.3
14	1 19 50.73	7.070	7 26 13.5	43.56	21 54.2
15	1 22 40.44	7.073	7 43 36.2	43.33	21 53.1
16	1 25 30.21	+7.075	+ 8 0 53.5	+43.10	21 52.0
17	1 28 20.04	7.078	8 18 5.2	42.87	21 50.9
18	1 31 9.93	7.080	8 35 11.1	42.62	21 49.8
19	1 33 59.89	7.083	8 52 11.1	42.37	21 48.7
20	1 36 49.92	7.086	9 9 5.1	42.12	21 47.6
21	1 39 40.03	+7.090	+ 9 25 52.8	+41.86	21 46.5
22	1 42 30.23	7.093	9 42 34.2	41.59	21 45.4
23	1 45 20.52	7.097	9 59 9.1	41.31	21 44.3
24	1 48 10.90	7.101	10 15 37.3	41.03	21 43.2
25	1 51 1.38	7.105	10 31 58.7	40.75	21 42.1
26	1 53 51.96	+7.110	+10 48 13.2	+40.46	21 41.0
27	1 56 42.66	7.115	11 4 20.6	40.16	21 39.9
28	1 59 33.47	7.120	11 20 20.9	39.86	21 38.8
29	2 2 24.41	7.126	11 36 13.8	39.55	21 37.7
30	2 5 15.48	7.131	11 51 59.3	39.24	21 36.6
31	2 8 6.67	+7.136	+12 7 37.2	+38.92	21 35.5
32	2 10 58.00	+7.141	+12 23 7.4	+38.59	21 34.4

JUNE.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	2 10 58.00	+7.141	+12 23 7.4	+38.59	21 34.4
2	2 13 49.46	7.147	12 38 29.7	38.26	21 33.4
3	2 16 41.06	7.153	12 53 44.0	37.92	21 32.3
4	2 19 32.81	7.159	13 8 50.2	37.58	21 31.2
5	2 22 24.70	7.165	13 23 48.1	37.24	21 30.1
6	2 25 16.74	+7.171	+13 38 37.5	+36.88	21 29.0
7	2 28 8.92	7.177	13 53 18.4	36.52	21 28.0
8	2 31 1.24	7.183	14 7 50.6	36.15	21 26.9
9	2 33 53.70	7.189	14 22 13.9	35.78	21 25.8
10	2 36 46.31	7.195	14 36 28.2	35.40	21 24.8
11	2 39 39.06	+7.201	+14 50 33.4	+35.02	21 23.7
12	2 42 31.95	7.206	15 4 29.3	34.64	21 22.7
13	2 45 24.97	7.212	15 18 15.9	34.24	21 21.6
14	2 48 18.12	7.218	15 31 53.0	33.84	21 20.5
15	2 51 11.41	7.223	15 45 20.4	33.44	21 19.5
16	2 54 4.84	+7.229	+15 58 38.2	+33.04	21 18.5
17	2 56 58.41	7.234	16 11 46.2	32.63	21 17.4
18	2 59 52.10	7.239	16 24 44.2	32.21	21 16.4
19	3 2 45.91	7.244	16 37 32.1	31.79	21 15.3
20	3 5 39.85	7.249	16 50 9.9	31.36	21 14.3
21	3 8 33.90	+7.255	+17 2 37.5	+30.93	21 13.2
22	3 11 28.08	7.260	17 14 54.7	30.50	21 12.2
23	3 14 22.38	7.265	17 27 1.4	30.06	21 11.2
24	3 17 16.82	7.271	17 38 57.7	29.62	21 10.1
25	3 20 11.38	7.276	17 50 43.5	29.18	21 9.1
26	3 23 6.06	+7.281	+18 2 18.5	+28.74	21 8.1
27	3 26 0.85	7.286	18 13 42.8	28.29	21 7.1
28	3 28 55.76	7.291	18 24 56.3	27.83	21 6.0
29	3 31 50.79	7.295	18 35 58.9	27.38	21 5.0
30	3 34 45.94	7.300	18 46 50.4	26.92	21 4.0
31	3 37 41.21	+7.305	+18 57 30.8	+26.45	21 3.0
32	3 40 36.58	+7.309	+19 8 0.1	+25.98	21 2.0

Day of the Month.	5th.	10th.	15th.	20th.	25th.	30th.
	″	″	″	″	″	″
Semidiameter	2.32	2.34	2.35	2.36	2.38	2.39
Horizontal Parallax . . .	4.05	4.07	4.09	4.12	4.14	4.17

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
	″	″	″	″	″	″
Semidiameter	2.41	2.42	2.44	2.46	2.48	2.50
Horizontal Parallax . . .	4.20	4.22	4.25	4.28	4.32	4.35

NOTE.—The sign + indicates north declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	3 37 41.21	+7.305	+18 57 30.8	+26.45	21 3.0
2	3 40 36.58	7.309	19 8 0.1	25.98	21 2.0
3	3 43 32.04	7.313	19 18 18.1	25.51	21 0.9
4	3 46 27.60	7.317	19 28 24.8	25.04	20 59.9
5	3 49 23.25	7.320	19 38 20.1	24.56	20 58.9
6	3 52 18.98	+7.323	+19 48 3.9	+24.08	20 57.9
7	3 55 14.77	7.326	19 57 36.1	23.60	20 56.9
8	3 58 10.62	7.329	20 6 56.6	23.11	20 55.9
9	4 1 6.53	7.331	20 16 5.5	22.62	20 54.9
10	4 4 2.49	7.332	20 25 2.7	22.13	20 53.9
11	4 6 58.49	+7.334	+20 33 48.0	+21.64	20 52.8
12	4 9 54.53	7.336	20 42 21.5	21.14	20 51.8
13	4 12 50.59	7.337	20 50 43.1	20.65	20 50.8
14	4 15 46.66	7.337	20 58 52.7	20.15	20 49.8
15	4 18 42.73	7.336	21 6 50.4	19.65	20 48.8
16	4 21 38.79	+7.336	+21 14 36.0	+19.15	20 47.8
17	4 24 34.84	7.335	21 22 9.5	18.65	20 46.8
18	4 27 30.87	7.334	21 29 31.0	18.14	20 45.8
19	4 30 26.86	7.332	21 36 40.4	17.64	20 44.8
20	4 33 22.81	7.330	21 43 37.7	17.14	20 43.8
21	4 36 18.72	+7.328	+21 50 22.9	+16.63	20 42.8
22	4 39 14.58	7.326	21 56 55.9	16.12	20 41.8
23	4 42 10.38	7.324	22 3 16.8	15.62	20 40.7
24	4 45 6.12	7.321	22 9 25.5	15.11	20 39.7
25	4 48 1.78	7.318	22 15 22.0	14.60	20 38.7
26	4 50 57.36	+7.315	+22 21 6.3	+14.10	20 37.7
27	4 53 52.85	7.311	22 26 38.5	13.59	20 36.7
28	4 56 48.25	7.307	22 31 58.6	13.08	20 35.6
29	4 59 43.54	7.302	22 37 6.5	12.58	20 34.6
30	5 2 38.73	7.297	22 42 2.2	12.07	20 33.6
31	5 5 33.79	+7.291	+22 46 45.7	+11.56	20 32.6
32	5 8 28.72	+7.285	+22 51 17.1	+11.05	20 31.5

AUGUST.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	5 8 28.72	+7.285	+22 51 17.1	+11.05	20 31.5
2	5 11 23.50	7.279	22 55 36.3	10.54	20 30.5
3	5 14 18.12	7.272	22 59 43.3	10.04	20 29.5
4	5 17 12.57	7.265	23 3 38.2	9.54	20 28.4
5	5 20 6.83	7.257	23 7 21.0	9.03	20 27.4
6	5 23 0.90	+7.249	+23 10 51.8	+8.53	20 26.4
7	5 25 54.76	7.240	23 14 10.6	8.03	20 25.3
8	5 28 48.40	7.230	23 17 17.4	7.53	20 24.3
9	5 31 41.80	7.220	23 20 12.2	7.04	20 23.2
10	5 34 34.95	7.209	23 22 55.1	6.54	20 22.2
11	5 37 27.84	+7.198	+23 25 26.2	+6.05	20 21.1
12	5 40 20.45	7.186	23 27 45.5	5.56	20 20.0
13	5 43 12.78	7.174	23 29 53.1	5.07	20 18.9
14	5 46 4.80	7.161	23 31 49.0	4.59	20 17.9
15	5 48 56.51	7.148	23 33 33.3	4.11	20 16.8
16	5 51 47.89	+7.134	+23 35 6.0	+3.63	20 15.7
17	5 54 38.94	7.120	23 36 27.3	3.15	20 14.6
18	5 57 29.65	7.106	23 37 37.2	2.68	20 13.5
19	6 0 20.01	7.091	23 38 35.8	2.21	20 12.4
20	6 3 10.01	7.076	23 39 23.1	1.74	20 11.3
21	6 5 59.64	+7.060	+23 39 59.3	+1.28	20 10.2
22	6 8 48.90	7.044	23 40 24.4	0.82	20 9.0
23	6 11 37.77	7.028	23 40 38.5	+0.36	20 7.9
24	6 14 26.24	7.011	23 40 41.7	−0.09	20 6.8
25	6 17 14.32	6.995	23 40 34.1	0.54	20 5.6
26	6 20 1.99	+6.978	+23 40 15.8	−0.99	20 4.5
27	6 22 49.24	6.961	23 39 46.8	1.43	20 3.3
28	6 25 36.06	6.943	23 39 7.2	1.87	20 2.1
29	6 28 22.44	6.923	23 38 17.1	2.31	20 0.9
30	6 31 8.36	6.903	23 37 16.6	2.74	19 59.8
31	6 33 53.80	+6.883	+23 36 5.8	−3.16	19 58.6
32	6 36 38.76	+6.863	+23 34 44.9	−3.58	19 57.4

Day of the Month.	4th.	9th.	14th.	19th.	24th.	29th.
	″	″	″	″	″	″
Semidiameter	2.52	2.54	2.56	2.59	2.62	2.64
Horizontal Parallax . . .	4.39	4.43	4.47	4.51	4.56	4.61

Day of the Month.	3d.	8th.	13th.	18th.	23d.	28th
	″	″	″	″	″	″
Semidiameter	2.68	2.71	2.74	2.78	2.82	2.86
Horizontal Parallax . . .	4.66	4.72	4.78	4.84	4.91	4.99

NOTE.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	6 36 38.76	+6.863	+23 34 44.9	− 3.58	19 57.4
2	6 39 23.23	6.843	23 33 14.1	3.99	19 56.2
3	6 42 7.21	6.822	23 31 33.3	4.40	19 55.0
4	6 44 50.67	6.800	23 29 42.8	4.81	19 53.7
5	6 47 33.61	6.778	23 27 42.6	5.21	19 52.5
6	6 50 16.01	+6.755	+23 25 32.8	− 5.60	19 51.3
7	6 52 57.85	6.732	23 23 13.6	5.99	19 50.0
8	6 55 39.12	6.708	23 20 45.2	6.37	19 48.7
9	6 58 19.81	6.683	23 18 7.6	6.75	19 47.5
10	7 0 59.90	6.658	23 15 21.1	7.12	19 46.2
11	7 3 39.40	+6.633	+23 12 25.7	− 7.49	19 44.9
12	7 6 18.29	6.608	23 9 21.6	7.85	19 43.6
13	7 8 56.56	6.582	23 6 9.0	8.20	19 42.3
14	7 11 34.20	6.555	23 2 48.0	8.55	19 41.0
15	7 14 11.20	6.528	22 59 18.7	8.89	19 39.6
16	7 16 47.56	+6.501	+22 55 41.3	− 9.23	19 38.3
17	7 19 23.26	6.474	22 51 55.9	9.56	19 36.9
18	7 21 58.31	6.447	22 48 2.6	9.88	19 35.6
19	7 24 32.70	6.419	22 44 1.7	10.20	19 34.2
20	7 27 6.41	6.390	22 39 53.3	10.51	19 32.8
21	7 29 39.45	+6.362	+22 35 37.4	−10.81	19 31.4
22	7 32 11.80	6.334	22 31 14.3	11.11	19 30.0
23	7 34 43.46	6.305	22 26 44.1	11.40	19 28.6
24	7 37 14.43	6.276	22 22 6.9	11.69	19 27.1
25	7 39 44.69	6.246	22 17 22.9	11.97	19 25.7
26	7 42 14.24	+6.216	+22 12 32.2	−12.24	19 24.2
27	7 44 43.07	6.186	22 7 35.1	12.51	19 22.7
28	7 47 11.17	6.155	22 2 31.8	12.77	19 21.3
29	7 49 38.52	6.124	21 57 22.4	13.02	19 19.8
30	7 52 5.11	6.092	21 52 7.0	13.26	19 18.3
31	7 54 30.94	+6.060	+21 46 45.9	−13.50	19 16.7
32	7 56 55.99	+6.028	+21 41 19.1	−13.73	19 15.2

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter	2.91	2.96	3.01	3.07	3.13	3.20
Horizontal Parallax . . .	5.07	5.16	5.25	5.35	5.46	5.57

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Merid ian P sage.
	h m s	s	° ′ ″	″	h
1	7 54 30.94	+6.060	+21 46 45.9	−13.50	19 16
2	7 56 55.99	6.028	21 41 19.1	13.73	19 15
3	7 59 20.26	5.995	21 35 46.9	13.95	19 13
4	8 1 43.73	5.961	21 30 9.5	14.16	19 12
5	8 4 6.40	5.927	21 24 27.1	14.37	19 10
6	8 6 28.25	+5.893	+21 18 39.9	−14.56	19 8
7	8 8 49.26	5.858	21 12 48.2	14.75	19 7
8	8 11 9.42	5.822	21 6 52.0	14.93	19 5
9	8 13 28.73	5.787	21 0 51.6	15.10	19 4
10	8 15 47.17	5.750	20 54 47.2	15.26	19 2
11	8 18 4.73	+5.713	+20 48 39.0	−15.42	19 0
12	8 20 21.41	5.677	20 42 27.1	15.57	18 59
13	8 22 37.20	5.640	20 36 11.8	15.71	18 57
14	8 24 52.09	5.602	20 29 53.2	15.84	18 55
15	8 27 6.07	5.564	20 23 31.6	15.96	18 54
16	8 29 19.14	+5.525	+20 17 7.2	−16.07	18 52
17	8 31 31.30	5.487	20 10 40.0	16.18	18 50
18	8 33 42.53	5.448	20 4 10.3	16.28	18 48.
19	8 35 52.83	5.410	19 57 38.3	16.38	18 47
20	8 38 2.18	5.370	19 51 4.1	16.46	18 45
21	8 40 10.59	+5.330	+19 44 28.0	−16.54	18 43
22	8 42 18.04	5.290	19 37 50.2	16.61	18 41.
23	8 44 24.52	5.250	19 31 10.9	16.67	18 39
24	8 46 30.02	5.209	19 24 30.2	16.72	18 37
25	8 48 34.54	5.167	19 17 48.4	16.76	18 35
26	8 50 38.05	+5.125	+19 11 5.7	−16.79	18 34
27	8 52 40.55	5.082	19 4 22.3	16.82	18 32.
28	8 54 42.02	5.040	18 57 38.5	16.83	18 30.
29	8 56 42.45	4.996	18 50 54.5	16.83	18 28.
30	8 58 41.82	4.951	18 44 10.5	16.83	18 26.
31	9 0 40.12	+4.906	+18 37 26.8	−16.81	18 24.
32	9 2 37.32	+4.860	+18 30 43.6	−16.78	18 22.

Day of the Month.	2d.	7th.	12th.	17th.	22d.	27th.
	″	″	″	″	″	″
Semidiameter	3.27	3.35	3.43	3.52	3.62	3.7
Horizontal Parallax . . .	5.70	5.83	5.97	6.13	6.30	6.4

NOTE.—The sign + indicates north declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	9 2 37.32	+4.860	+18 30 43.6	−16.78	18 22.3
2	9 4 33.42	4.814	18 24 1.1	16.75	18 20.3
3	9 6 28.39	4.767	18 17 19.7	16.70	18 18.3
4	9 8 22.21	4.718	18 10 39.5	16.64	18 16.2
5	9 10 14.88	4.670	18 4 0.8	16.57	18 14.1
6	9 12 6.37	+4.620	+17 57 23.9	−16.49	18 12.0
7	9 13 56.67	4.570	17 50 49.1	16.40	18 9.9
8	9 15 45.75	4.519	17 44 16.5	16.30	18 7.8
9	9 17 33.60	4.468	17 37 46.5	16.19	18 5.6
0	9 19 20.20	4.416	17 31 19.2	16.07	18 3.4
1	9 21 5.53	+4.362	+17 24 55.0	−15.94	18 1.2
2	9 22 49.58	4.308	17 18 33.9	15.80	17 59.0
3	9 24 32.34	4.254	17 12 16.3	15.66	17 56.8
4	9 26 13.79	4.200	17 6 2.4	15.50	17 54.5
5	9 27 53.92	4.144	16 59 52.4	15.33	17 52.2
6	9 29 32.72	+4.088	+16 53 46.5	−15.15	17 49.9
7	9 31 10.16	4.031	16 47 45.1	14.97	17 47.6
8	9 32 46.22	3.973	16 41 48.3	14.76	17 45.2
9	9 34 20.89	3.915	16 35 56.5	14.55	17 42.8
20	9 35 54.13	3.855	16 30 9.8	14.33	17 40.4
21	9 37 25.93	+3.794	+16 24 28.6	−14.10	17 38.0
22	9 38 56.26	3.733	16 18 53.0	13.86	17 35.6
23	9 40 25.10	3.670	16 13 23.4	13.61	17 33.1
24	9 41 52.42	3.606	16 8 0.1	13.34	17 30.6
25	9 43 18.20	3.541	16 2 43.4	13.06	17 28.1
26	9 44 42.40	+3.475	+15 57 33.7	−12.76	17 25.5
27	9 46 4.99	3.407	15 52 31.1	12.45	17 22.9
28	9 47 25.95	3.338	15 47 36.1	12.13	17 20.3
29	9 48 45.24	3.268	15 42 48.7	11.80	17 17.7
30	9 50 2.84	3.197	15 38 9.5	11.46	17 15.0
31	9 51 18.71	+3.124	+15 33 38.7	−11.10	17 12.3
32	9 52 32.80	+3.049	+15 29 16.7	−10.73	17 9.6

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	9 51 18.71	+3.124	+15 33 38.7	−11.10	17 12.3
2	9 52 32.80	3.049	15 29 16.7	10.73	17 9.6
3	9 53 45.07	2.973	15 25 3.8	10.34	17 6.8
4	9 54 55.50	2.895	15 21 0.4	9.94	17 4.1
5	9 56 4.04	2.816	15 17 6.8	9.53	17 1.3
6	9 57 10.66	+2.735	+15 13 23.2	− 9.10	16 58.4
7	9 58 15.33	2.653	15 9 50.0	8.66	16 55.5
8	9 59 18.01	2.569	15 6 27.4	8.21	16 52.6
9	10 0 18.66	2.484	15 3 15.8	7.75	16 49.7
10	10 1 17.25	2.397	15 0 15.3	7.28	16 46.7
11	10 2 13.75	+2.309	+14 57 26.3	− 6.80	16 43.7
12	10 3 8.12	2.220	14 54 49.0	6.30	16 40.6
13	10 4 0.34	2.130	14 52 23.8	5.80	16 37.5
14	10 4 50.36	2.038	14 50 10.8	5.28	16 34.4
15	10 5 38.14	1.943	14 48 10.3	4.76	16 31.2
16	10 6 23.65	+1.848	+14 46 22.5	− 4.22	16 28.0
17	10 7 6.85	1.751	14 44 47.8	3.67	16 24.8
18	10 7 47.70	1.652	14 43 26.4	3.11	16 21.5
19	10 8 26.16	1.552	14 42 18.8	2.53	16 18.2
20	10 9 2.18	1.449	14 41 25.1	1.94	16 14.8
21	10 9 35.72	+1.345	+14 40 45.5	− 1.35	16 11.4
22	10 10 6.74	1.239	14 40 20.3	0.74	16 7.9
23	10 10 35.19	1.131	14 40 9.9	− 0.12	16 4.4
24	10 11 1.03	1.021	14 40 14.4	+ 0.50	16 0.9
25	10 11 24.20	0.909	14 40 34.1	1.14	15 57.3
26	10 11 44.66	+0.795	+14 41 9.2	+ 1.79	15 53.7
27	10 12 2.37	0.680	14 42 0.1	2.45	15 50.0
28	10 12 17.28	0.562	14 43 6.8	3.12	15 46.3
29	10 12 29.35	0.443	14 44 29.6	3.79	15 42.6
30	10 12 38.52	0.321	14 46 8.6	4.47	15 38.8
31	10 12 44.75	+0.198	+14 48 4.2	+ 5.16	15 34.9
32	10 12 48.00	+0.073	+14 50 16.4	+ 5.86	15 31.0

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.
	″	″	″	″	″	″
Semidiameter	3.83	3.95	4.08	4.23	4.38	4.55
Horizontal Parallax . . .	6.67	6.89	7.12	7.37	7.63	7.92

Day of the Month.	1st.	6th.	11th.	16th.	21st.	26th.	31st.
	″	″	″	″	″	″	″
Semidiameter . .	4.72	4.92	5.12	5.34	5.57	5.81	6.06
Horizontal Par. .	8.23	8.57	8.93	9.31	9.71	10.13	10.56

NOTE.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

JUPITER, 1915.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	21 40 32.01	+2.027	−14 52 10.9	+10.23	2 59.9
2	21 41 20.79	2.038	14 48 4.2	10.32	2 56.8
3	21 42 9.84	2.049	14 43 55.5	10.41	2 53.7
4	21 42 59.15	2.060	14 39 44.8	10.49	2 50.6
5	21 43 48.72	2.071	14 35 32.0	10.57	2 47.5
6	21 44 38.54	+2.081	−14 31 17.3	+10.65	2 44.4
7	21 45 28.60	2.091	14 27 0.7	10.73	2 41.3
8	21 46 18.91	2.101	14 22 42.2	10.81	2 38.2
9	21 47 9.45	2.111	14 18 21.8	10.89	2 35.1
10	21 48 0.21	2.120	14 13 59.6	10.96	2 32.0
11	21 48 51.20	+2.129	−14 9 35.5	+11.04	2 28.9
12	21 49 42.40	2.138	14 5 9.6	11.11	2 25.8
13	21 50 33.80	2.147	14 0 42.0	11.19	2 22.7
14	21 51 25.41	2.155	13 56 12.7	11.26	2 19.6
15	21 52 17.21	2.163	13 51 41.6	11.33	2 16.6
16	21 53 9.19	+2.170	−13 47 8.8	+11.40	2 13.5
17	21 54 1.35	2.178	13 42 34.3	11.47	2 10.4
18	21 54 53.69	2.185	13 37 58.2	11.54	2 7.4
19	21 55 46.20	2.192	13 33 20.5	11.61	2 4.3
20	21 56 38.87	2.198	13 28 41.2	11.67	2 1.3
21	21 57 31.70	+2.204	−13 24 0.4	+11.73	1 58.2
22	21 58 24.67	2.210	13 19 18.2	11.79	1 55.1
23	21 59 17.79	2.216	13 14 34.5	11.85	1 52.1
24	22 0 11.04	2.222	13 9 49.3	11.91	1 49.0
25	22 1 4.42	2.228	13 5 2.8	11.97	1 46.0
26	22 1 57.92	+2.233	−13 0 14.9	+12.03	1 43.0
27	22 2 51.54	2.238	12 55 25.6	12.08	1 39.9
28	22 3 45.27	2.242	12 50 35.0	12.14	1 36.9
29	22 4 39.11	2.246	12 45 43.1	12.19	1 33.8
30	22 5 33.06	2.250	12 40 49.9	12.24	1 30.8
31	22 6 27.11	+2.254	−12 35 55.5	+12.29	1 27.8
32	22 7 21.24	+2.258	−12 30 59.9	+12.34	1 24.7

Day of the Month.	0	8th.	16th.	24th.
	″	″	″	″
Semidiameter . . .	16.56	16.33	16.13	15.98
Horizontal Parallax	1.55	1.53	1.51	1.49

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Merid- ian Pa sage.
	h m s	s	° ′ ″	″	h m
1	22 7 21.24	+2.258	−12 30 59.9	+12.34	1 24.
2	22 8 15.46	2.262	12 26 3.1	12.39	1 21.
3	22 9 9.76	2.265	12 21 5.1	12.44	1 18.
4	22 10 4.14	2.268	12 16 6.0	12.48	1 15.
5	22 10 58.60	2.271	12 11 5.8	12.53	1 12.
6	22 11 53.13	+2.274	−12 6 4.5	+12.58	1 9.
7	22 12 47.72	2.276	12 1 2.1	12.62	1 6.
8	22 13 42.36	2.278	11 55 58.7	12.66	1 3.
9	22 14 37.06	2.280	11 50 54.4	12.70	1 0.
10	22 15 31.82	2.282	11 45 49.1	12.74	0 57.
11	22 16 26.62	+2.283	−11 40 42.8	+12.78	0 54.
12	22 17 21.45	2.285	11 35 35.6	12.82	0 51.
13	22 18 16.32	2.286	11 30 27.6	12.85	0 48.
14	22 19 11.21	2.287	11 25 18.8	12.88	0 45.
15	22 20 6.13	2.288	11 20 9.2	12.91	0 42.
16	22 21 1.07	+2.289	−11 14 58.9	+12.94	0 39.
17	22 21 56.02	2.289	11 9 47.8	12.97	0 36.
18	22 22 50.96	2.289	11 4 36.1	13.00	0 33.
19	22 23 45.91	2.289	10 59 23.8	13.02	0 30.
20	22 24 40.85	2.289	10 54 10.9	13.05	0 27.
21	22 25 35.78	+2.289	−10 48 57.4	+13.07	0 24.
22	22 26 30.70	2.288	10 43 43.4	13.09	0 21.
23	22 27 25.60	2.288	10 38 28.9	13.11	0 18.
24	22 28 20.48	2.287	10 33 13.9	13.13	0 15.
25	22 29 15.33	2.285	10 27 58.5	13.15	0 12.
26	22 30 10.14	+2.284	−10 22 42.7	+13.16	0 9.1
27	22 31 4.91	2.282	10 17 26.6	13.18	0 6.1
28	22 31 59.64	2.280	10 12 10.1	13.19	0 3.1
29	22 32 54.33	2.278	10 6 53.3	13.20	0 0.1 23 57.0
30	22 33 48.96	2.276	10 1 36.3	13.21	23 54.0
31	22 34 43.54	+2.273	− 9 56 19.0	+13.22	23 51.0
32	22 35 38.06	+2.271	− 9 51 1.5	+13.23	23 48.0

Day of the Month.	1st.	9th.	17th.	25th.
	″	″	″	″
Semidiameter . . .	15.86	15.77	15.72	15.71
Horizontal Parallax	1.48	1.47	1.47	1.47

NOTE.—The sign − indicates south declinations.

GREENWICH MEAN TIME.

MARCH.						APRIL.					
	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
1	22 32 54.33	+2.278	−10 6 53.3	+13.20	0 0.1 23 57.0	1	23 0 23.40	+2.126	−7 23 50.3	+12.84	22 22.5
2	22 33 48.96	2.276	10 1 36.3	13.21	23 54.0	2	23 1 14.32	2.118	7 18 42.5	12.81	22 19.4
3	22 34 43.54	2.273	9 56 19.0	13.22	23 51.0	3	23 2 5.05	2.110	7 13 35.5	12.77	22 16.3
4	22 35 38.06	2.271	9 51 1.5	13.23	23 48.0	4	23 2 55.58	2.102	7 8 29.4	12.73	22 13.2
5	22 36 32.53	2.268	9 45 43.8	13.24	23 44.9	5	23 3 45.91	2.094	7 3 24.3	12.69	22 10.1
6	22 37 26.93	+2.265	− 9 40 25.9	+13.24	23 41.9	6	23 4 36.05	+2.085	−6 58 20.2	+12.65	22 7.0
7	22 38 21.26	2.262	9 35 7.9	13.25	23 38.9	7	23 5 25.98	2.076	6 53 17.0	12.61	22 3.9
8	22 39 15.52	2.259	9 29 49.8	13.25	23 35.8	8	23 6 15.71	2.067	6 48 14.9	12.57	22 0.8
9	22 40 9.70	2.255	9 24 31.6	13.26	23 32.8	9	23 7 5.22	2.058	6 43 13.9	12.52	21 57.6
0	22 41 3.80	2.252	9 19 13.5	13.26	23 29.7	10	23 7 54.51	2.049	6 38 14.0	12.47	21 54.5
1	22 41 57.81	+2.248	− 9 13 55.4	+13.25	23 26.7	11	23 8 43.58	+2.040	−6 33 15.4	+12.42	21 51.4
2	22 42 51.72	2.244	9 8 37.4	13.25	23 23.7	12	23 9 32.42	2.030	6 28 18.0	12.37	21 48.3
3	22 43 45.54	2.240	9 3 19.4	13.24	23 20.6	13	23 10 21.02	2.020	6 23 21.8	12.32	21 45.1
4	22 44 39.26	2.236	8 58 1.6	13.24	23 17.6	14	23 11 9.38	2.010	6 18 27.0	12.26	21 42.0
5	22 45 32.87	2.232	8 52 44.0	13.23	23 14.6	15	23 11 57.49	2.000	6 13 33.6	12.20	21 38.9
6	22 46 26.37	+2.227	− 8 47 26.6	+13.22	23 11.5	16	23 12 45.35	+1.990	−6 8 41.6	+12.14	21 35.7
7	22 47 19.75	2.222	8 42 9.5	13.21	23 8.5	17	23 13 32.95	1.979	6 3 51.0	12.08	21 32.6
18	22 48 13.01	2.217	8 36 52.7	13.20	23 5.4	18	23 14 20.30	1.968	5 59 1.9	12.01	21 29.4
19	22 49 6.15	2.212	8 31 36.2	13.18	23 2.4	19	23 15 7.38	1.957	5 54 14.4	11.95	21 26.3
20	22 49 59.16	2.206	8 26 20.1	13.16	22 59.3	20	23 15 54.19	1.946	5 49 28.4	11.88	21 23.1
21	22 50 52.03	+2.200	− 8 21 4.4	+13.14	22 56.3	21	23 16 40.73	+1.934	−5 44 44.0	+11.81	21 20.0
22	22 51 44.75	2.194	8 15 49.2	13.12	22 53.2	22	23 17 26.98	1.922	5 40 1.3	11.74	21 16.8
23	22 52 37.33	2.188	8 10 34.5	13.10	22 50.1	23	23 18 12.95	1.910	5 35 20.3	11.67	21 13.6
24	22 53 29.76	2.182	8 5 20.4	13.08	22 47.1	24	23 18 58.63	1.898	5 30 41.0	11.60	21 10.4
25	22 54 22.04	2.176	8 0 6.8	13.05	22 44.0	25	23 19 44.01	1.886	5 26 3.4	11.53	21 7.2
26	22 55 14.17	+2.170	− 7 54 53.8	+13.03	22 40.9	26	23 20 29.10	+1.873	−5 21 27.6	+11.45	21 4.0
27	22 56 6.13	2.163	7 49 41.4	13.00	22 37.9	27	23 21 13.89	1.860	5 16 53.7	11.38	21 0.8
28	22 56 57.93	2.156	7 44 29.7	12.97	22 34.8	28	23 21 58.38	1.847	5 12 21.6	11.30	20 57.6
29	22 57 49.56	2.148	7 39 18.7	12.94	22 31.7	29	23 22 42.55	1.834	5 7 51.4	11.22	20 54.4
30	22 58 41.02	2.141	7 34 8.5	12.91	22 28.6	30	23 23 26.41	1.821	5 3 23.2	11.14	20 51.2
31	22 59 32.30	+2.133	− 7 28 59.0	+12.88	22 25.5	31	23 24 9.95	+1.808	−4 58 56.9	+11.06	20 48.0
32	23 0 23.40	+2.126	− 7 23 50.3	+12.84	22 22.5	32	23 24 53.17	+1.794	−4 54 32.6	+10.97	20 44.8

Day of the Month.	5th.	18th.	21st.	29th.	Day of the Month.	6th.	14th.	22d.	30th.
	″	″	″	″		″	″	″	″
Semidiameter . . .	15.73	15.79	15.88	16.00	Semidiameter . . .	16.16	16.36	16.59	16.86
Horizontal Parallax	1.47	1.48	1.48	1.49	Horizontal Parallax	1.51	1.53	1.55	1.58

NOTE.—The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	23 24 9.95	+1.808	−4 58 56.9	+11.06	20 48.0
2	23 24 53.17	1.794	4 54 32.6	10.97	20 44.8
3	23 25 36.06	1.780	4 50 10.3	10.89	20 41.6
4	23 26 18.62	1.766	4 45 50.1	10.80	20 38.4
5	23 27 0.84	1.752	4 41 32.1	10.71	20 35.1
6	23 27 42.71	+1.737	−4 37 16.2	+10.61	20 31.9
7	23 28 24.23	1.723	4 33 2.6	10.52	20 28.6
8	23 29 5.40	1.708	4 28 51.2	10.42	20 25.4
9	23 29 46.20	1.693	4 24 42.2	10.32	20 22.1
10	23 30 26.64	1.677	4 20 35.5	10.22	20 18.9
11	23 31 6.70	+1.661	−4 16 31.2	+10.12	20 15.6
12	23 31 46.38	1.645	4 12 29.4	10.02	20 12.3
13	23 32 25.67	1.629	4 8 30.1	9.92	20 9.0
14	23 33 4.58	1.612	4 4 33.3	9.81	20 5.7
15	23 33 43.09	1.596	4 0 39.1	9.70	20 2.4
16	23 34 21.19	+1.579	−3 56 47.6	+ 9.59	19 59.1
17	23 34 58.88	1.562	3 52 58.8	9.48	19 55.8
18	23 35 36.15	1.545	3 49 12.7	9.36	19 52.5
19	23 36 13.01	1.527	3 45 29.3	9.25	19 49.2
20	23 36 49.44	1.509	3 41 48.7	9.13	19 45.8
21	23 37 25.44	+1.491	−3 38 11.0	+ 9.01	19 42.5
22	23 38 1.00	1.473	3 34 36.1	8.89	19 39.1
23	23 38 36.12	1.454	3 31 4.1	8.77	19 35.8
24	23 39 10.80	1.435	3 27 35.1	8.65	19 32.4
25	23 39 45.02	1.416	3 24 9.0	8.52	19 29.1
26	23 40 18.79	+1.397	−3 20 46.0	+ 8.40	19 25.7
27	23 40 52.09	1.378	3 17 26.0	8.27	19 22.3
28	23 41 24.93	1.358	3 14 9.1	8.14	19 18.9
29	23 41 57.29	1.338	3 10 55.3	8.01	19 15.5
30	23 42 29.18	1.318	3 7 44.7	7.87	19 12.1
31	23 43 0.58	+1.298	−3 4 37.3	+ 7.74	19 8.7
32	23 43 31.49	+1.277	−3 1 33.2	+ 7.60	19 5.2

JUNE.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	23 43 31.49	+1.277	−3 1 33.2	+7.60	19 5.2
2	23 44 1.91	1.256	2 58 32.4	7.47	19 1.8
3	23 44 31.82	1.235	2 55 34.9	7.33	18 58.4
4	23 45 1.23	1.214	2 52 40.8	7.19	18 54.9
5	23 45 30.12	1.192	2 49 50.1	7.04	18 51.5
6	23 45 58.49	+1.170	−2 47 2.9	+6.89	18 48.0
7	23 46 26.33	1.148	2 44 19.2	6.75	18 44.5
8	23 46 53.64	1.126	2 41 39.1	6.60	18 41.0
9	23 47 20.40	1.103	2 39 2.6	6.45	18 37.5
10	23 47 46.61	1.080	2 36 29.8	6.29	18 34.0
11	23 48 12.26	+1.057	−2 34 0.8	+6.13	18 30.5
12	23 48 37.35	1.034	2 31 35.5	5.98	18 27.0
13	23 49 1.88	1.010	2 29 14.0	5.82	18 23.5
14	23 49 25.83	0.986	2 26 56.3	5.66	18 19.9
15	23 49 49.20	0.962	2 24 42.4	5.50	18 16.4
16	23 50 11.99	+0.938	−2 22 32.5	+5.33	18 12.8
17	23 50 34.19	0.913	2 20 26.5	5.17	18 9.2
18	23 50 55.79	0.888	2 18 24.5	5.00	18 5.6
19	23 51 16.79	0.863	2 16 26.4	4.84	18 2.0
20	23 51 37.18	0.838	2 14 32.4	4.67	17 58.4
21	23 51 56.96	+0.812	−2 12 42.5	+4.50	17 54.8
22	23 52 16.12	0.786	2 10 56.6	4.33	17 51.2
23	23 52 34.66	0.760	2 9 14.9	4.15	17 47.6
24	23 52 52.57	0.734	2 7 37.3	3.98	17 43.9
25	23 53 9.85	0.707	2 6 3.9	3.80	17 40.3
26	23 53 26.50	+0.680	−2 4 34.6	+3.63	17 36.6
27	23 53 42.52	0.653	2 3 9.6	3.45	17 33.0
28	23 53 57.89	0.626	2 1 48.9	3.27	17 29.3
29	23 54 12.61	0.599	2 0 32.5	3.09	17 25.6
30	23 54 26.67	0.572	1 59 20.4	2.91	17 21.9
31	23 54 40.07	+0.544	−1 58 12.7	+2.73	17 18.2
32	23 54 52.81	+0.516	−1 57 9.4	+2.55	17 14.5

Day of the Month.	8th.	16th.	24th.
	″	″	″
Semidiameter	17.16	17.50	17.87
Horizontal Parallax	1.61	1.64	1.67

Day of the Month.	1st.	9th.	17th.	25th.
	″	″	″	″
Semidiameter	18.28	18.72	19.19	19.69
Horizontal Parallax	1.71	1.75	1.79	1.84

NOTE.—The sign — indicates south declinations.

GREENWICH MEAN TIME.

JULY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 54 40.07	+0.544	−1 58 12.7	+2.73	17 18.2
2	23 54 52.81	0.516	1 57 9.4	2.55	17 14.5
3	23 55 4.88	0.488	1 56 10.5	2.36	17 10.7
4	23 55 16.27	0.460	1 55 16.9	2.18	17 6.9
5	23 55 26.97	0.431	1 54 26.1	1.99	17 3.2
6	23 55 36.98	+0.403	−1 53 40.7	+1.80	16 59.4
7	23 55 46.31	0.374	1 52 59.8	1.61	16 55.6
8	23 55 54.94	0.345	1 52 23.5	1.42	16 51.8
9	23 56 2.87	0.316	1 51 51.7	1.23	16 48.0
10	23 56 10.10	0.287	1 51 24.5	1.04	16 44.2
11	23 56 16.62	+0.257	−1 51 2.0	+0.84	16 40.4
12	23 56 22.43	0.228	1 50 44.2	0.65	16 36.5
13	23 56 27.52	0.198	1 50 31.1	0.45	16 32.7
14	23 56 31.89	0.168	1 50 22.6	0.26	16 28.8
15	23 56 35.55	0.138	1 50 18.8	+0.06	16 24.9
16	23 56 38.50	+0.108	−1 50 19.6	−0.13	16 21.0
17	23 56 40.73	0.078	1 50 25.1	0.33	16 17.1
18	23 56 42.23	0.048	1 50 35.3	0.52	16 13.2
19	23 56 43.02	+0.018	1 50 50.1	0.71	16 9.3
20	23 56 43.09	−0.012	1 51 9.5	0.91	16 5.3
21	23 56 42.44	−0.042	−1 51 33.5	−1.10	16 1.4
22	23 56 41.07	0.072	1 52 2.2	1.29	15 57.4
23	23 56 38.98	0.102	1 52 35.5	1.48	15 53.4
24	23 56 36.17	0.132	1 53 13.4	1.68	15 49.4
25	23 56 32.64	0.162	1 53 55.9	1.87	15 45.4
26	23 56 28.39	−0.192	−1 54 42.9	−2.06	15 41.4
27	23 56 23.43	0.222	1 55 34.5	2.25	15 37.4
28	23 56 17.76	0.252	1 56 30.7	2.44	15 33.4
29	23 56 11.37	0.282	1 57 31.4	2.63	15 29.3
30	23 56 4.27	0.312	1 58 36.6	2.82	15 25.3
31	23 55 56.46	−0.341	−1 59 46.3	−3.00	15 21.2
32	23 55 47.94	−0.370	−2 1 0.5	−3.19	15 17.1

Day of the Month.	3d.	11th.	19th.	27th.
	″	″	″	″
Semidiameter . . .	20.20	20.73	21.26	21.78
Horizontal Parallax	1.89	1.94	1.99	2.04

AUGUST.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 55 47.94	−0.370	−2 1 0.5	−3.19	15 17.1
2	23 55 38.72	0.399	2 2 19.1	3.37	15 13.0
3	23 55 28.80	0.428	2 3 42.2	3.55	15 8.9
4	23 55 18.18	0.457	2 5 9.6	3.73	15 4.8
5	23 55 6.86	0.486	2 6 41.4	3.91	15 0.7
6	23 54 54.86	−0.514	−2 8 17.5	−4.09	14 56.5
7	23 54 42.17	0.542	2 9 57.9	4.27	14 52.4
8	23 54 28.81	0.570	2 11 42.4	4.44	14 48.2
9	23 54 14.79	0.598	2 13 31.1	4.61	14 44.1
10	23 54 0.11	0.625	2 15 23.8	4.78	14 39.9
11	23 53 44.77	−0.652	−2 17 20.6	−4.95	14 35.7
12	23 53 28.79	0.679	2 19 21.3	5.11	14 31.5
13	23 53 12.17	0.705	2 21 25.9	5.27	14 27.3
14	23 52 54.93	0.731	2 23 34.2	5.42	14 23.1
15	23 52 37.08	0.756	2 25 46.2	5.57	14 18.9
16	23 52 18.63	−0.781	−2 28 1.8	−5.72	14 14.6
17	23 51 59.59	0.805	2 30 21.0	5.87	14 10.4
18	23 51 39.97	0.829	2 32 43.6	6.01	14 6.1
19	23 51 19.79	0.852	2 35 9.6	6.15	14 1.8
20	23 50 59.06	0.875	2 37 38.8	6.28	13 57.5
21	23 50 37.80	−0.897	−2 40 11.1	−6.41	13 53.2
22	23 50 16.01	0.919	2 42 46.5	6.53	13 48.9
23	23 49 53.71	0.940	2 45 24.8	6.65	13 44.6
24	23 49 30.91	0.960	2 48 6.0	6.77	13 40.3
25	23 49 7.63	0.980	2 50 50.0	6.88	13 36.0
26	23 48 43.89	−0.999	−2 53 36.6	−6.99	13 31.7
27	23 48 19.69	1.017	2 56 25.7	7.10	13 27.3
28	23 47 55.05	1.035	2 59 17.3	7.20	13 23.0
29	23 47 29.99	1.052	3 2 11.2	7.29	13 18.6
30	23 47 4.52	1.069	3 5 7.4	7.38	13 14.3
31	23 46 38.66	−1.085	−3 8 5.7	−7.47	13 9.9
32	23 46 12.44	−1.100	−3 11 5.9	−7.55	13 5.6

Day of the Month.	4th.	12th.	20th.	28th.
	″	″	″	″
Semidiameter . . .	22.28	22.73	23.12	23.43
Horizontal Parallax	2.08	2.12	2.16	2.19

NOTE.—The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; the sign − indicates that south declinations are increasing.

JUPITER, 1915.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	23 46 12.44	−1.100	−3 11 5.9	−7.55	13 5.6
2	23 45 45.86	1.114	3 14 7.9	7.62	13 1.2
3	23 45 18.95	1.128	3 17 11.7	7.69	12 56.8
4	23 44 51.73	1.141	3 20 17.0	7.75	12 52.4
5	23 44 24.20	1.153	3 23 23.8	7.81	12 48.0
6	23 43 56.39	−1.164	−3 26 31.9	−7.86	12 43.6
7	23 43 28.33	1.174	3 29 41.2	7.91	12 39.2
8	23 43 0.04	1.183	3 32 51.5	7.95	12 34.8
9	23 42 31.54	1.191	3 36 2.6	7.98	12 30.4
10	23 42 2.85	1.198	3 39 14.5	8.00	12 26.0
11	23 41 33.99	−1.204	−3 42 26.9	−8.02	12 21.6
12	23 41 4.99	1.210	3 45 39.7	8.03	12 17.2
13	23 40 35.87	1.215	3 48 52.7	8.04	12 12.8
14	23 40 6.65	1.218	3 52 5.8	8.04	12 8.3
15	23 39 37.36	1.221	3 55 18.8	8.04	12 3.9
16	23 39 8.02	−1.223	−3 58 31.6	−8.03	11 59.5
17	23 38 38.64	1.224	4 1 44.1	8.01	11 55.1
18	23 38 9.26	1.224	4 4 56.1	7.99	11 50.7
19	23 37 39.89	1.223	4 8 7.5	7.96	11 46.3
20	23 37 10.55	1.221	4 11 18.1	7.92	11 41.9
21	23 36 41.27	−1.218	−4 14 27.7	−7.88	11 37.4
22	23 36 12.07	1.214	4 17 36.3	7.83	11 33.0
23	23 35 42.97	1.209	4 20 43.7	7.78	11 28.6
24	23 35 13.99	1.204	4 23 49.8	7.72	11 24.2
25	23 34 45.15	1.198	4 26 54.4	7.66	11 19.8
26	23 34 16.48	−1.191	−4 29 57.5	−7.59	11 15.4
27	23 33 47.99	1.183	4 32 58.8	7.52	11 11.0
28	23 33 19.71	1.174	4 35 58.2	7.44	11 6.6
29	23 32 51.66	1.164	4 38 55.7	7.35	11 2.2
30	23 32 23.85	1.153	4 41 51.1	7.26	10 57.8
31	23 31 56.30	−1.141	−4 44 44.2	−7.17	10 53.4
32	23 31 29.05	−1.129	−4 47 35.0	−7.07	10 49.0

Day of the Month.	5th.	13th.	21st.	29th.
	″	″	″	″
Semidiameter . . .	23.64	23.75	23.74	23.62
Horizontal Parallax	2.21	2.22	2.22	2.21

OCTOBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	23 31 56.30	−1.141	−4 44 44.2	−7.17	10 53.4
2	23 31 29.05	1.129	4 47 35.0	7.07	10 49.0
3	23 31 2.11	1.116	4 50 23.3	6.96	10 44.7
4	23 30 35.51	1.102	4 53 8.9	6.85	10 40.3
5	23 30 9.25	1.087	4 55 51.8	6.73	10 35.9
6	23 29 43.36	−1.071	−4 58 31.8	−6.61	10 31.6
7	23 29 17.87	1.054	5 1 8.7	6.48	10 27.2
8	23 28 52.79	1.036	5 3 42.5	6.35	10 22.9
9	23 28 28.15	1.018	5 6 13.1	6.21	10 18.5
10	23 28 3.96	0.999	5 8 40.3	6.07	10 14.2
11	23 27 40.23	−0.979	−5 11 4.1	−5.92	10 9.8
12	23 27 16.99	0.958	5 13 24.3	5.77	10 5.5
13	23 26 54.25	0.937	5 15 40.9	5.61	10 1.2
14	23 26 32.02	0.915	5 17 53.7	5.45	9 56.9
15	23 26 10.33	0.892	5 20 2.7	5.29	9 52.6
16	23 25 49.21	−0.869	−5 22 7.7	−5.13	9 48.3
17	23 25 28.65	0.845	5 24 8.7	4.96	9 44.1
18	23 25 8.67	0.821	5 26 5.6	4.79	9 39.8
19	23 24 49.27	0.796	5 27 58.4	4.61	9 35.6
20	23 24 30.47	0.771	5 29 47.0	4.44	9 31.3
21	23 24 12.28	−0.745	−5 31 31.3	−4.26	9 27.1
22	23 23 54.72	0.719	5 33 11.3	4.08	9 22.9
23	23 23 37.80	0.692	5 34 46.9	3.89	9 18.7
24	23 23 21.52	0.665	5 36 18.2	3.71	9 14.5
25	23 23 5.90	0.637	5 37 45.0	3.52	9 10.3
26	23 22 50.94	−0.609	−5 39 7.2	−3.33	9 6.1
27	23 22 36.66	0.581	5 40 24.9	3.14	9 2.0
28	23 22 23.06	0.552	5 41 38.0	2.95	8 57.8
29	23 22 10.16	0.523	5 42 46.4	2.75	8 53.7
30	23 21 57.96	0.494	5 43 50.2	2.56	8 49.6
31	23 21 46.46	−0.464	−5 44 49.2	−2.36	8 45.5
32	23 21 35.67	−0.434	−5 45 43.4	−2.16	8 41.4

Day of the Month.	7th.	15th.	23d.	31st.
	″	″	″	″
Semidiameter . . .	23.39	23.06	22.66	22.19
Horizontal Parallax	2.19	2.16	2.12	2.07

Note.—The sign — indicates south declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
h m s	s	° ′ ″	″	h m
23 21 35.67	−0.434	−5 45 43.4	−2.16	8 41.4
23 21 25.61	0.404	5 46 32.8	1.96	8 37.3
23 21 16.28	0.374	5 47 17.4	1.76	8 33.2
23 21 7.69	0.343	5 47 57.1	1.55	8 29.1
23 20 59.83	0.312	5 48 31.9	1.35	8 25.1
23 20 52.72	−0.281	−5 49 1.8	−1.14	8 21.0
23 20 46.36	0.250	5 49 26.8	0.94	8 17.0
23 20 40.76	0.218	5 49 46.8	0.73	8 13.0
23 20 35.92	0.187	5 50 1.8	0.52	8 9.0
23 20 31.85	0.155	5 50 11.8	0.31	8 5.0
23 20 28.54	−0.123	−5 50 16.9	−0.11	8 1.0
23 20 26.00	0.091	5 50 17.0	+0.10	7 57.0
23 20 24.22	0.059	5 50 12.1	0.30	7 53.0
23 20 23.20	−0.027	5 50 2.3	0.51	7 49.1
23 20 22.95	+0.005	5 49 47.5	0.71	7 45.1
23 20 23.47	+0.038	−5 49 27.8	+0.92	7 41.2
23 20 24.75	0.069	5 49 3.2	1.12	7 37.3
23 20 26.79	0.100	5 48 33.7	1.33	7 33.4
23 20 29.59	0.132	5 47 59.3	1.53	7 29.5
23 20 33.15	0.163	5 47 20.1	1.74	7 25.7
23 20 37.47	+0.194	−5 46 36.1	+1.94	7 21.8
23 20 42.54	0.226	5 45 47.2	2.14	7 18.0
23 20 48.37	0.257	5 44 53.5	2.34	7 14.2
23 20 54.95	0.289	5 43 55.0	2.53	7 10.4
23 21 2.26	0.320	5 42 51.8	2.73	7 6.6
23 21 10.32	+0.351	−5 41 43.9	+2.93	7 2.8
23 21 19.12	0.382	5 40 31.3	3.13	6 59.0
23 21 28.66	0.413	5 39 14.0	3.32	6 55.2
23 21 38.93	0.443	5 37 52.0	3.52	6 51.4
23 21 49.93	0.474	5 36 25.3	3.71	6 47.7
23 22 1.66	+0.504	−5 34 54.0	+3.90	6 43.9
23 22 14.11	+0.534	−5 33 18.2	+4.09	6 40.2

Day of the Month.	8th.	16th.	24th.
	″	″	″
Semidiameter	21.68	21.14	20.60
Horizontal Parallax	2.03	1.98	1.93

DECEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	23 22 1.66	+0.504	−5 34 54.0	+3.90	6 43.9
2	23 22 14.11	0.534	5 33 18.2	4.09	6 40.2
3	23 22 27.29	0.564	5 31 37.7	4.28	6 36.5
4	23 22 41.18	0.594	5 29 52.7	4.47	6 32.8
5	23 22 55.78	0.623	5 28 3.2	4.66	6 29.1
6	23 23 11.09	+0.652	−5 26 9.2	+4.84	6.25.4
7	23 23 27.09	0.681	5 24 10.8	5.03	6 21.8
8	23 23 43.79	0.710	5 22 8.0	5.21	6 18.1
9	23 24 1.18	0.738	5 20 0.8	5.39	6 14.5
10	23 24 19.26	0.767	5 17 49.3	5.57	6 10.8
11	23 24 38.02	+0.795	−5 15 33.5	+5.75	6 7.2
12	23 24 57.44	0.823	5 13 13.5	5.92	6 3.6
13	23 25 17.53	0.851	5 10 49.3	6.10	6 0.0
14	23 25 38.27	0.878	5 8 20.9	6.27	5 56.4
15	23 25 59.66	0.905	5 5 48.5	6.44	5 52.8
16	23 26 21.69	+0.931	−5 3 12.0	+6.61	5 49.3
17	23 26 44.36	0.957	5 0 31.5	6.77	5 45.7
18	23 27 7.65	0.983	4 57 47.0	6.93	5 42.2
19	23 27 31.56	1.009	4 54 58.7	7.09	5 38.6
20	23 27 56.08	1.034	4 52 6.5	7.25	5 35.1
21	23 28 21.20	+1.059	−4 49 10.5	+7.41	5 31.6
22	23 28 46.93	1.084	4 46 10.7	7.57	5 28.1
23	23 29 13.25	1.109	4 43 7.1	7.73	5 24.6
24	23 29 40.15	1.133	4 39 59.8	7.88	5 21.1
25	23 30 7.63	1.157	4 36 48.9	8.03	5 17.7
26	23 30 35.67	+1.181	−4 33 34.4	+8.18	5 14.2
27	23 31 4.28	1.204	4 30 16.3	8.33	5 10.8
28	23 31 33.45	1.227	4 26 54.6	8.47	5 7.3
29	23 32 3.17	1.250	4 23 29.5	8.62	5 3.9
30	23 32 33.44	1.272	4 20 0.9	8.76	5 0.4
31	23 33 4.25	+1.295	−4 16 28.9	+8.90	4 57.0
32	23 33 35.59	+1.317	−4 12 53.5	+9.04	4 53.6

Day of Month.	2d.	10th.	18th.	26th.	34th.
	″	″	″	″	″
Semidiam.	20.06	19.53	19.03	18.56	18.13
Hor. Par. .	1.88	1.83	1.78	1.74	1.70

NOTE.—The sign + prefixed to the hourly change of declination indicates that south declinations are decreasing; the sign − indicates that south declinations are increasing.

GREENWICH MEAN TIME.

JANUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	5 51 7.53	−0.863	+22 18 51.5	+0.14	11 8.9
2	5 50 46.89	0.857	22 18 54.8	0.14	11 4.6
3	5 50 26.39	0.851	22 18 58.2	0.14	11 0.4
4	5 50 6.05	0.844	22 19 1.5	0.14	10 56.1
5	5 49 45.88	0.837	22 19 4.9	0.14	10 51.8
6	5 49 25.88	−0.829	+22 19 8.3	+0.14	10 47.6
7	5 49 6.08	0.821	22 19 11.7	0.14	10 43.3
8	5 48 46.48	0.812	22 19 15.2	0.15	10 39.1
9	5 48 27.09	0.803	22 19 18.7	0.15	10 34.8
10	5 48 7.93	0.794	22 19 22.3	0.15	10 30.6
11	5 47 49.01	−0.784	+22 19 25.9	+0.15	10 26.3
12	5 47 30.33	0.773	22 19 29.6	0.16	10 22.1
13	5 47 11.90	0.762	22 19 33.4	0.16	10 17.8
14	5 46 53.75	0.751	22 19 37.2	0.16	10 13.6
15	5 46 35.88	0.739	22 19 41.1	0.17	10 9.4
16	5 46 18.29	−0.726	+22 19 45.2	+0.17	10 5.2
17	5 46 1.01	0.714	22 19 49.3	0.17	10 0.9
18	5 45 44.04	0.701	22 19 53.5	0.18	9 56.7
19	5 45 27.39	0.687	22 19 57.8	0.18	9 52.5
20	5 45 11.07	0.673	22 20 2.3	0.19	9 48.3
21	5 44 55.08	−0.659	+22 20 6.8	+0.19	9 44.1
22	5 44 39.45	0.644	22 20 11.5	0.20	9 40.0
23	5 44 24.17	0.629	22 20 16.3	0.20	9 35.8
24	5 44 9.25	0.614	22 20 21.2	0.21	9 31.6
25	5 43 54.70	0.598	22 20 26.3	0.22	9 27.4
26	5 43 40.53	−0.583	+22 20 31.5	+0.22	9 23.3
27	5 43 26.74	0.566	22 20 36.9	0.23	9 19.1
28	5 43 13.34	0.550	22 20 42.5	0.23	9 14.9
29	5 43 0.34	0.533	22 20 48.2	0.24	9 10.8
30	5 42 47.74	0.516	22 20 54.0	0.25	9 6.7
31	5 42 35.55	−0.499	+22 21 0.1	+0.26	9 2.5
32	5 42 23.77	−0.482	+22 21 6.4	+0.26	8 58.4

Day of the Month.	1st.	9th.	17th.	25th.
	″	″	″	″
Semidiameter . . .	9.62	9.58	9.51	9.43
Horizontal Parallax	1.09	1.09	1.08	1.07

FEBRUARY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Mer ian sag
	h m s	s	° ′ ″	″	h
1	5 42 23.77	−0.482	+22 21 6.4	+0.26	8 5
2	5 42 12.42	0.464	22 21 12.8	0.27	8 5
3	5 42 1.48	0.447	22 21 19.4	0.28	8 5
4	5 41 50.98	0.429	22 21 26.3	0.29	8 4
5	5 41 40.91	0.410	22 21 33.3	0.30	8 4
6	5 41 31.28	−0.392	+22 21 40.6	+0.31	8 3
7	5 41 22.10	0.373	22 21 48.0	0.32	8 3
8	5 41 13.37	0.354	22 21 55.7	0.33	8 2
9	5 41 5.09	0.335	22 22 3.6	0.33	8 2
10	5 40 57.27	0.316	22 22 11.8	0.34	8 2
11	5 40 49.92	−0.297	+22 22 20.1	+0.35	8 1
12	5 40 43.03	0.277	22 22 28.8	0.36	8 1
13	5 40 36.62	0.257	22 22 37.6	0.37	8
14	5 40 30.68	0.238	22 22 46.7	0.38	8
15	5 40 25.21	0.218	22 22 56.0	0.39	8
16	5 40 20.23	−0.198	+22 23 5.6	+0.40	7 57
17	5 40 15.73	0.177	22 23 15.4	0.41	7 5
18	5 40 11.72	0.157	22 23 25.4	0.42	7 4
19	5 40 8.19	0.137	22 23 35.7	0.43	7 4
20	5 40 5.15	0.116	22 23 46.2	0.44	7 4
21	5 40 2.60	−0.096	+22 23 56.9	+0.45	7 37
22	5 40 0.54	0.076	22 24 7.9	0.46	7 3
23	5 39 58.96	0.055	22 24 19.1	0.47	7 2
24	5 39 57.88	0.035	22 24 30.6	0.48	7 2
25	5 39 57.28	−0.014	22 24 42.3	0.49	7 2
26	5 39 57.18	+0.007	+22 24 54.2	+0.50	7 17
27	5 39 57.56	0.027	22 25 6.3	0.51	7 13
28	5 39 58.43	0.047	22 25 18.7	0.52	7 9
29	5 39 59.79	0.067	22 25 31.3	0.53	7 6
30	5 40 1.64	0.087	22 25 44.1	0.54	7 2
31	5 40 3.97	+0.107	+22 25 57.1	+0.55	6 58
32	5 40 6.79	+0.127	+22 26 10.3	+0.56	6 54

Day of the Month.	2d.	10th.	18th.	26th.
	″	″	″	″
Semidiameter . . .	9.32	9.21	9.09	8.9
Horizontal Parallax	1.06	1.05	1.03	1.0

Note.—The sign + indicates north declinations.

GREENWICH MEAN TIME.

MARCH.					APRIL.					
Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
5 39 59.79	+0.067	+22 25 31.3	+0.53	7 6.0	1	5 44 36.23	+0.659	+22 33 23.8	+0.69	5 8.8
5 40 1.64	0.087	22 25 44.1	0.54	7 2.1	2	5 44 52.23	0.675	22 33 40.4	0.69	5 5.1
5 40 3.97	0.107	22 25 57.1	0.55	6 58.2	3	5 45 8.64	0.692	22 33 56.9	0.69	5 1.4
5 40 6.79	0.127	22 26 10.3	0.56	6 54.3	4	5 45 25.46	0.709	22 34 13.4	0.69	4 57.8
5 40 10.09	0.148	22 26 23.8	0.57	6 50.5	5	5 45 42.66	0.725	22 34 29.9	0.69	4 54.1
5 40 13.87	+0.168	+22 26 37.5	+0.57	6 46.6	6	5 46 0.26	+0.741	+22 34 46.4	+0.68	4 50.5
5 40 18.14	0.188	22 26 51.3	0.58	6 42.7	7	5 46 18.25	0.758	22 35 2.8	0.68	4 46.9
5 40 22.89	0.208	22 27 5.4	0.59	6 38.9	8	5 46 36.63	0.774	22 35 19.1	0.68	4 43.2
5 40 28.13	0.228	22 27 19.7	0.60	6 35.0	9	5 46 55.39	0.789	22 35 35.3	0.67	4 39.6
5 40 33.84	0.248	22 27 34.1	0.61	6 31.2	10	5 47 14.52	0.805	22 35 51.5	0.67	4 36.0
5 40 40.03	+0.268	+22 27 48.7	+0.61	6 27.4	11	5 47 34.03	+0.821	+22 36 7.5	+0.67	4 32.4
5 40 46.70	0.288	22 28 3.5	0.62	6 23.6	12	5 47 53.90	0.836	22 36 23.4	0.66	4 28.8
5 40 53.84	0.308	22 28 18.5	0.63	6 19.7	13	5 48 14.15	0.851	22 36 39.3	0.66	4 25.2
5 41 1.46	0.327	22 28 33.6	0.63	6 15.9	14	5 48 34.75	0.866	22 36 54.9	0.65	4 21.6
5 41 9.55	0.347	22 28 48.9	0.64	6 12.1	15	5 48 55.70	0.881	22 37 10.5	0.64	4 18.0
5 41 18.11	+0.366	+22 29 4.4	+0.65	6 8.4	16	5 49 17.01	+0.895	+22 37 25.8	+0.64	4 14.5
5 41 27.14	0.386	22 29 19.9	0.65	6 4.6	17	5 49 38.66	0.909	22 37 41.0	0.63	4 10.9
5 41 36.63	0.405	22 29 35.6	0.66	6 0.8	18	5 50 0.66	0.923	22 37 56.1	0.62	4 7.3
5 41 46.58	0.424	22 29 51.4	0.66	5 57.0	19	5 50 22.98	0.937	22 38 10.9	0.61	4 3.8
5 41 56.99	0.443	22 30 7.3	0.67	5 53.3	20	5 50 45.64	0.951	22 38 25.6	0.61	4 0.2
5 42 7.86	+0.462	+22 30 23.4	+0.67	5 49.5	21	5 51 8.62	+0.964	+22 38 40.0	+0.60	3 56.7
5 42 19.17	0.481	22 30 39.5	0.67	5 45.8	22	5 51 31.92	0.977	22 38 54.3	0.59	3 53.1
5 42 30.93	0.499	22 30 55.7	0.68	5 42.1	23	5 51 55.54	0.990	22 39 8.3	0.58	3 49.6
5 42 43.14	0.518	22 31 12.0	0.68	5 38.3	24	5 52 19.46	1.003	22 39 22.0	0.57	3 46.0
5 42 55.78	0.536	22 31 28.3	0.68	5 34.6	25	5 52 43.69	1.016	22 39 35.6	0.56	3 42.5
5 43 8.86	+0.554	+22 31 44.7	+0.68	5 30.9	26	5 53 8.22	+1.028	+22 39 48.8	+0.55	3 39.0
5 43 22.36	0.572	22 32 1.2	0.69	5 27.2	27	5 53 33.04	1.040	22 40 1.8	0.54	3 35.5
5 43 36.30	0.589	22 32 17.7	0.69	5 23.5	28	5 53 58.15	1.052	22 40 14.6	0.52	3 31.9
5 43 50.66	0.607	22 32 34.2	0.69	5 19.8	29	5 54 23.54	1.064	22 40 27.0	0.51	3 28.4
5 44 5.43	0.624	22 32 50.7	0.69	5 16.1	30	5 54 49.22	1.076	22 40 39.2	0.50	3 24.9
5 44 20.62	+0.642	+22 33 7.3	+0.69	5 12.4	31	5 55 15.17	+1.087	+22 40 51.0	+0.49	3 21.4
5 44 36.23	+0.659	+22 33 23.8	+0.69	5 8.8	32	5 55 41.39	+1.098	+22 41 2.6	+0.47	3 17.9

Day of the Month.	6th.	14th.	22d.	30th.
	″	″	″	″
Semidiameter . . .	8.83	8.69	8.57	8.44
Horizontal Parallax	1.00	0.99	0.97	0.96

Day of the Month.	7th.	15th.	23d.
	″	″	″
Semidiameter	8.33	8.22	8.12
Horizontal Parallax . . .	0.95	0.93	0.92

NOTE.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing.

GREENWICH MEAN TIME.

MAY.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	5 55 15.17	+1.087	+22 40 51.0	+0.49	3 21.4
2	5 55 41.39	1.098	22 41 2.6	0.47	3 17.9
3	5 56 7.88	1.109	22 41 13.8	0.46	3 14.4
4	5 56 34.63	1.120	22 41 24.8	0.45	3 11.0
5	5 57 1.64	1.131	22 41 35.3	0.43	3 7.5
6	5 57 28.90	+1.141	+22 41 45.6	+0.42	3 4.0
7	5 57 56.42	1.152	22 41 55.5	0.40	3 0.5
8	5 58 24.18	1.162	22 42 5.0	0.39	2 57.0
9	5 58 52.18	1.172	22 42 14.1	0.37	2 53.6
10	5 59 20.42	1.181	22 42 22.9	0.36	2 50.1
11	5 59 48.89	+1.191	+22 42 31.3	+0.34	2 46.7
12	6 0 17.58	1.200	22 42 39.2	0.32	2 43.2
13	6 0 46.50	1.209	22 42 46.8	0.31	2 39.7
14	6 1 15.63	1.218	22 42 54.0	0.29	2 36.3
15	6 1 44.97	1.227	22 43 0.7	0.27	2 32.9
16	6 2 14.52	+1.235	+22 43 7.1	+0.25	2 29.4
17	6 2 44.27	1.244	22 43 12.9	0.24	2 26.0
18	6 3 14.21	1.252	22 43 18.4	0.22	2 22.5
19	6 3 44.34	1.259	22 43 23.4	0.20	2 19.1
20	6 4 14.66	1.267	22 43 28.0	0.18	2 15.7
21	6 4 45.16	+1.274	+22 43 32.0	+0.16	2 12.3
22	6 5 15.83	1.281	22 43 35.7	0.14	2 8.8
23	6 5 46.67	1.288	22 43 38.8	0.12	2 5.4
24	6 6 17.67	1.295	22 43 41.5	0.10	2 2.0
25	6 6 48.83	1.302	22 43 43.7	0.08	1 58.6
26	6 7 20.15	+1.308	+22 43 45.5	+0.06	1 55.2
27	6 7 51.61	1.314	22 43 46.7	0.04	1 51.8
28	6 8 23.22	1.320	22 43 47.5	+0.02	1 48.3
29	6 8 54.97	1.326	22 43 47.8	0.00	1 44.9
30	6 9 26.86	1.331	22 43 47.6	−0.02	1 41.5
31	6 9 58.88	+1.337	+22 43 46.8	−0.04	1 38.1
32	6 10 31.03	+1.342	+22 43 45.6	−0.06	1 34.7

Day of the Month.	1st.	9th.	17th.	25th.
	″	″	″	″
Semidiameter . . .	8.03	7.95	7.89	7.83
Horizontal Parallax	0.91	0.90	0.90	0.89

JUNE.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	6 10 31.03	+1.342	+22 43 45.6	−0.06	1 34.7
2	6 11 3.31	1.347	22 43 43.9	0.08	1 31.3
3	6 11 35.71	1.352	22 43 41.7	0.10	1 28.0
4	6 12 8.22	1.357	22 43 38.9	0.13	1 24.6
5	6 12 40.84	1.362	22 43 35.6	0.15	1 21.2
6	6 13 13.57	+1.366	+22 43 31.8	−0.17	1 17.8
7	6 13 46.40	1.370	22 43 27.5	0.19	1 14.4
8	6 14 19.33	1.374	22 43 22.7	0.21	1 11.0
9	6 14 52.36	1.378	22 43 17.3	0.24	1 7.6
10	6 15 25.47	1.381	22 43 11.4	0.26	1 4.2
11	6 15 58.66	+1.385	+22 43 4.9	−0.28	1 0.9
12	6 16 31.93	1.388	22 42 57.9	0.30	0 57.5
13	6 17 5.28	1.391	22 42 50.4	0.33	0 54.1
14	6 17 38.69	1.394	22 42 42.3	0.35	0 50.7
15	6 18 12.16	1.396	22 42 33.7	0.37	0 47.3
16	6 18 45.69	+1.398	+22 42 24.6	−0.39	0 44.0
17	6 19 19.28	1.400	22 42 14.9	0.41	0 40.6
18	6 19 52.91	1.402	22 42 4.7	0.44	0 37.2
19	6 20 26.59	1.404	22 41 54.0	0.46	0 33.8
20	6 21 0.30	1.405	22 41 42.7	0.48	0 30.5
21	6 21 34.04	+1.407	+22 41 31.0	−0.50	0 27.1
22	6 22 7.82	1.408	22 41 18.6	0.52	0 23.7
23	6 22 41.61	1.409	22 41 5.8	0.55	0 20.4
24	6 23 15.43	1.409	22 40 52.5	0.57	0 17.0
25	6 23 49.26	1.410	22 40 38.6	0.59	0 13.6
26	6 24 23.10	+1.410	+22 40 24.2	−0.61	0 10.2
27	6 24 56.95	1.411	22 40 9.3	0.63	0 6.9
28	6 25 30.80	1.411	22 39 53.9	0.65	0 3.5
29	6 26 4.65	1.410	22 39 38.0	0.67	0 0.1 23 56
30	6 26 38.50	1.410	22 39 21.5	0.70	23 53.4
31	6 27 12.34	+1.410	+22 39 4.6	−0.72	23 50.0
32	6 27 46.16	+1.409	+22 38 47.1	−0.74	23 46.6

Day of the Month.	2d.	10th.	18th.	26th.
	″	″	″	″
Semidiameter . . .	7.79	7.75	7.73	7.72
Horizontal Parallax	0.88	0.88	0.88	0.88

Note.—The sign + indicates north declinations.

GREENWICH MEAN TIME.

JULY.

Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
h m s	s	° ′ ″	″	h m
6 27 12.34	+1.410	+22 39 4.6	−0.72	23 50.0
6 27 46.16	1.409	22 38 47.1	0.74	23 46.6
6 28 19.97	1.408	22 38 29.2	0.76	23 43.3
6 28 53.76	1.407	22 38 10.7	0.78	23 39.9
6 29 27.52	1.406	22 37 51.8	0.80	23 36.5
6 30 1.24	+1.405	+22 37 32.4	−0.82	23 33.2
6 30 34.93	1.403	22 37 12.5	0.84	23 29.8
6 31 8.59	1.401	22 36 52.1	0.86	23 26.4
6 31 42.19	1.399	22 36 31.2	0.88	23 23.0
6 32 15.75	1.397	22 36 9.9	0.90	23 19.7
6 32 49.24	+1.395	+22 35 48.1	−0.92	23 16.3
6 33 22.68	1.392	22 35 25.9	0.94	23 12.9
6 33 56.06	1.389	22 35 3.3	0.95	23 9.5
6 34 29.36	1.386	22 34 40.2	0.97	23 6.1
6 35 2.58	1.383	22 34 16.6	0.99	23 2.8
6 35 35.73	+1.379	+22 33 52.7	−1.01	22 59.4
6 36 8.79	1.376	22 33 28.3	1.02	22 56.0
6 36 41.76	1.372	22 33 3.5	1.04	22 52.6
6 37 14.63	1.368	22 32 38.3	1.06	22 49.2
6 37 47.41	1.364	22 32 12.8	1.07	22 45.8
6 38 20.08	+1.359	+22 31 46.9	−1.09	22 42.4
6 38 52.64	1.354	22 31 20.6	1.10	22 39.0
6 39 25.10	1.350	22 30 53.9	1.12	22 35.6
6 39 57.43	1.345	22 30 26.9	1.13	22 32.2
6 40 29.64	1.340	22 29 59.5	1.15	22 28.8
6 41 1.73	+1.334	+22 29 31.8	−1.16	22 25.4
6 41 33.69	1.329	22 29 3.8	1.17	22 22.0
6 42 5.52	1.323	22 28 35.5	1.19	22 18.6
6 42 37.22	1.318	22 28 6.9	1.20	22 15.2
6 43 8.77	1.312	22 27 37.9	1.21	22 11.8
6 43 40.18	+1.306	+22 27 8.7	−1.22	22 8.4
6 44 11.44	+1.299	+22 26 39.2	−1.24	22 5.0

Day of the Month.	4th.	12th.	20th.	28th.
	″	″	″	″
Semidiameter . . .	7.73	7.74	7.76	7.80
Horizontal Parallax	0.88	0.88	0.88	0.89

AUGUST.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	6 44 11.44	+1.299	+22 26 39.2	−1.24	22 5.0
2	6 44 42.54	1.293	22 26 9.4	1.25	22 1.6
3	6 45 13.48	1.286	22 25 39.4	1.26	21 58.1
4	6 45 44.26	1.279	22 25 9.1	1.27	21 54.7
5	6 46 14.87	1.272	22 24 38.6	1.28	21 51.3
6	6 46 45.31	+1.265	+22 24 7.8	−1.29	21 47.9
7	6 47 15.57	1.257	22 23 36.9	1.29	21 44.4
8	6 47 45.64	1.249	22 23 5.8	1.30	21 41.0
9	6 48 15.53	1.241	22 22 34.4	1.31	21 37.6
10	6 48 45.22	1.233	22 22 2.9	1.32	21 34.1
11	6 49 14.71	+1.225	+22 21 31.3	−1.32	21 30.7
12	6 49 43.99	1.216	22 20 59.5	1.33	21 27.2
13	6 50 13.07	1.207	22 20 27.6	1.33	21 23.8
14	6 50 41.93	1.198	22 19 55.6	1.34	21 20.3
15	6 51 10.58	1.189	22 19 23.5	1.34	21 16.9
16	6 51 39.00	+1.179	+22 18 51.3	−1.34	21 13.4
17	6 52 7.19	1.170	22 18 19.0	1.35	21 9.9
18	6 52 35.15	1.160	22 17 46.7	1.35	21 6.4
19	6 53 2.87	1.150	22 17 14.3	1.35	21 3.0
20	6 53 30.35	1.140	22 16 41.9	1.35	20 59.5
21	6 53 57.58	+1.130	+22 16 9.5	−1.35	20 56.0
22	6 54 24.57	1.119	22 15 37.1	1.35	20 52.5
23	6 54 51.30	1.108	22 15 4.7	1.35	20 49.0
24	6 55 17.77	1.098	22 14 32.4	1.35	20 45.5
25	6 55 43.98	1.087	22 14 0.0	1.35	20 42.0
26	6 56 9.93	+1.076	+22 13 27.7	−1.34	20 38.5
27	6 56 35.61	1.064	22 12 55.5	1.34	20 35.0
28	6 57 1.01	1.053	22 12 23.4	1.34	20 31.5
29	6 57 26.14	1.041	22 11 51.4	1.33	20 28.0
30	6 57 50.98	1.029	22 11 19.5	1.33	20 24.5
31	6 58 15.53	+1.017	+22 10 47.7	−1.32	20 20.9
32	6 58 39.79	+1.005	+22 10 16.0	−1.32	20 17.4

Day of the Month.	5th.	13th.	21st.	29th.
	″	″	″	″
Semidiameter . . .	7.85	7.91	7.98	8.06
Horizontal Parallax	0.89	0.90	0.91	0.92

NOTE.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the sign − indicates that north declinations are decreasing.

SATURN, 1915.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	6 58 39.79	+1.005	+22 10 16.0	−1.32	20 17.4
2	6 59 3.75	0.992	22 9 44.6	1.31	20 13.9
3	6 59 27.40	0.979	22 9 13.3	1.30	20 10.3
4	6 59 50.75	0.966	22 8 42.2	1.29	20 6.8
5	7 0 13.78	0.953	22 8 11.3	1.28	20 3.2
6	7 0 36.50	+0.940	+22 7 40.6	−1.27	19 59.6
7	7 0 58.89	0.926	22 7 10.1	1.26	19 56.1
8	7 1 20.95	0.912	22 6 40.0	1.25	19 52.5
9	7 1 42.68	0.898	22 6 10.1	1.24	19 48.9
10	7 2 4.07	0.884	22 5 40.5	1.23	19 45.4
11	7 2 25.12	+0.870	+22 5 11.2	−1.21	19 41.8
12	7 2 45.82	0.855	22 4 42.2	1.20	19 38.2
13	7 3 6.17	0.840	22 4 13.6	1.19	19 34.6
14	7 3 26.17	0.826	22 3 45.3	1.17	19 31.0
15	7 3 45.80	0.811	22 3 17.4	1.15	19 27.4
16	7 4 5.07	+0.795	+22 2 50.0	−1.14	19 23.7
17	7 4 23.98	0.780	22 2 22.9	1.12	19 20.1
18	7 4 42.51	0.764	22 1 56.2	1.10	19 16.5
19	7 5 0.67	0.749	22 1 30.0	1.08	19 12.9
20	7 5 18.44	0.733	22 1 4.2	1.06	19 9.2
21	7 5 35.84	+0.717	+22 0 38.9	−1.04	19 5.6
22	7 5 52.85	0.701	22 0 14.1	1.02	19 1.9
23	7 6 9.47	0.684	21 59 49.8	1.00	18 58.2
24	7 6 25.70	0.668	21 59 26.0	0.98	18 54.6
25	7 6 41.54	0.651	21 59 2.6	0.96	18 50.9
26	7 6 56.97	+0.635	+21 58 39.8	−0.94	18 47.2
27	7 7 12.00	0.618	21 58 17.6	0.91	18 43.5
28	7 7 26.62	0.601	21 57 55.9	0.89	18 39.8
29	7 7 40.82	0.583	21 57 34.8	0.87	18 36.1
30	7 7 54.61	0.566	21 57 14.3	0.84	18 32.4
31	7 8 7.98	+0.548	+21 56 54.4	−0.82	18 28.7
32	7 8 20.93	+0.530	+21 56 35.2	−0.79	18 25.0

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meri ian P sage.
	h m s	s	° ′ ″	″	h
1	7 8 7.98	+0.548	+21 56 54.4	−0.82	18 28
2	7 8 20.93	0.530	21 56 35.2	0.79	18 25
3	7 8 33.44	0.512	21 56 16.5	0.76	18 21
4	7 8 45.52	0.494	21 55 58.5	0.74	18 17
5	7 8 57.17	0.476	21 55 41.2	0.71	18 13
6	7 9 8.38	+0.458	+21 55 24.5	−0.68	18 10
7	7 9 19.14	0.439	21 55 8.6	0.65	18 6
8	7 9 29.45	0.420	21 54 53.3	0.62	18 2
9	7 9 39.32	0.402	21 54 38.8	0.59	17 58
10	7 9 48.73	0.383	21 54 25.0	0.56	17 54
11	7 9 57.68	+0.364	+21 54 11.9	−0.53	17 51
12	7 10 6.18	0.345	21 53 59.6	0.50	17 47
13	7 10 14.22	0.325	21 53 48.0	0.47	17 43
14	7 10 21.80	0.306	21 53 37.2	0.43	17 39
15	7 10 28.91	0.287	21 53 27.2	0.40	17 35
16	7 10 35.55	+0.267	+21 53 18.0	−0.37	17 32
17	7 10 41.73	0.248	21 53 9.5	0.34	17 28
18	7 10 47.44	0.228	21 53 1.9	0.30	17 24
19	7 10 52.68	0.209	21 52 55.0	0.27	17 20
20	7 10 57.45	0.189	21 52 49.0	0.23	17 16
21	7 11 1.75	+0.169	+21 52 43.7	−0.20	17 12
22	7 11 5.58	0.150	21 52 39.3	0.17	17 9
23	7 11 8.93	0.130	21 52 35.7	0.13	17 5
24	7 11 11.80	0.110	21 52 33.0	0.10	17 1
25	7 11 14.20	0.090	21 52 31.0	0.06	16 57
26	7 11 16.12	+0.070	+21 52 29.9	−0.03	16 53
27	7 11 17.56	0.050	21 52 29.7	+0.01	16 49
28	7 11 18.52	0.030	21 52 30.3	0.04	16 45
29	7 11 18.99	+0.010	21 52 31.7	0.08	16 41
30	7 11 18.99	−0.010	21 52 34.0	0.11	16 37
31	7 11 18.50	−0.030	+21 52 37.2	+0.15	16 33
32	7 11 17.53	−0.050	+21 52 41.2	+0.18	16 29

Day of the Month.	6th.	14th.	22d.	30th.
	″	″	″	″
Semidiameter . . .	8.16	8.26	8.37	8.49
Horizontal Parallax	0.93	0.94	0.95	0.96

Day of the Month.	8th.	16th.	24th.
	″	″	″
Semidiameter	8.61	8.74	8.8
Horizontal Parallax . . .	0.98	0.99	1.0

NOTE.—The sign + indicates north declinations.

GREENWICH MEAN TIME.

NOVEMBER.						DECEMBER.				
Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
7 11 17.53	−0.050	+21 52 41.2	+0.18	16 29.8	1	7 7 13.66	−0.603	+22 0 58.2	+1.14	14 27.7
7 11 16.08	0.071	21 52 46.0	0.22	16 25.8	2	7 6 59.01	0.618	22 1 25.8	1.16	14 23.5
7 11 14.15	0.091	21 52 51.8	0.26	16 21.9	3	7 6 43.99	0.633	22 1 53.9	1.18	14 19.3
7 11 11.73	0.111	21 52 58.3	0.29	16 17.9	4	7 6 28.62	0.648	22 2 22.6	1.21	14 15.1
7 11 8.83	0.131	21 53 5.8	0.33	16 13.9	5	7 6 12.90	0.662	22 2 51.8	1.23	14 10.9
7 11 5.45	−0.151	+21 53 14.1	+0.36	16 9.9	6	7 5 56.84	−0.676	+22 3 21.5	+1.25	14 6.7
7 11 1.59	0.171	21 53 23.2	0.40	16 5.9	7	7 5 40.46	0.690	22 3 51.7	1.27	14 2.5
7 10 57.25	0.191	21 53 33.2	0.43	16 1.9	8	7 5 23.75	0.703	22 4 22.3	1.29	13 58.3
7 10 52.44	0.210	21 53 44.1	0.47	15 57.9	9	7 5 6.74	0.715	22 4 53.5	1.31	13 54.1
7 10 47.16	0.230	21 53 55.8	0.50	15 53.9	10	7 4 49.42	0.728	22 5 25.0	1.32	13 49.9
7 10 41.40	−0.249	+21 54 8.3	+0.54	15 49.8	11	7 4 31.82	−0.739	+22 5 56.9	+1.34	13 45.6
7 10 35.18	0.269	21 54 21.6	0.57	15 45.8	12	7 4 13.94	0.751	22 6 29.2	1.35	13 41.4
7 10 28.50	0.288	21 54 35.8	0.61	15 41.7	13	7 3 55.78	0.762	22 7 1.9	1.37	13 37.2
7 10 21.36	0.307	21 54 50.8	0.64	15 37.7	14	7 3 37.37	0.772	22 7 34.9	1.38	13 32.9
7 10 13.76	0.326	21 55 6.6	0.67	15 33.6	15	7 3 18.71	0.783	22 8 8.3	1.40	13 28.7
7 10 5.70	−0.345	+21 55 23.1	+0.71	15 29.6	16	7 2 59.81	−0.792	+22 8 41.9	+1.41	13 24.4
7 9 57.20	0.363	21 55 40.5	0.74	15 25.5	17	7 2 40.68	0.802	22 9 15.8	1.42	13 20.2
7 9 48.26	0.382	21 55 58.6	0.77	15 21.4	18	7 2 21.34	0.810	22 9 49.9	1.43	13 15.9
7 9 38.88	0.400	21 56 17.4	0.80	15 17.3	19	7 2 1.79	0.819	22 10 24.3	1.44	13 11.7
7 9 29.06	0.418	21 56 37.0	0.83	15 13.2	20	7 1 42.04	0.827	22 10 58.9	1.45	13 7.4
7 9 18.81	−0.436	+21 56 57.4	+0.86	15 9.1	21	7 1 22.11	−0.834	+22 11 33.7	+1.45	13 3.1
7 9 8.13	0.454	21 57 18.4	0.89	15 5.0	22	7 1 2.00	0.841	22 12 8.6	1.46	12 58.9
7 8 57.03	0.471	21 57 40.2	0.92	15 0.9	23	7 0 41.73	0.848	22 12 43.7	1.47	12 54.6
7 8 45.51	0.489	21 58 2.6	0.95	14 56.7	24	7 0 21.31	0.854	22 13 19.0	1.47	12 50.3
7 8 33.58	0.506	21 58 25.8	0.98	14 52.6	25	7 0 0.75	0.860	22 13 54.3	1.47	12 46.1
7 8 21.25	−0.522	+21 58 49.6	+1.01	14 48.5	26	6 59 40.05	−0.865	+22 14 29.8	+1.48	12 41.8
7 8 8.51	0.539	21 59 14.0	1.03	14 44.3	27	6 59 19.24	0.869	22 15 5.3	1.48	12 37.5
7 7 55.37	0.555	21 59 39.2	1.06	14 40.2	28	6 58 58.32	0.874	22 15 40.8	1.48	12 33.2
7 7 41.85	0.572	22 0 4.9	1.09	14 36.0	29	6 58 37.31	0.877	22 16 16.5	1.48	12 28.9
7 7 27.94	0.587	22 0 31.3	1.11	14 31.8	30	6 58 16.21	0.881	22 16 52.1	1.48	12 24.7
7 7 13.66	−0.603	+22 0 58.2	+1.14	14 27.7	31	6 57 55.05	−0.883	+22 17 27.7	+1.48	12 20.4
7 6 59.00	−0.618	+22 1 25.8	+1.16	14 23.5	32	6 57 33.82	−0.885	+22 18 3.3	+1.48	12 16.1

Day of the Month.	1st.	9th.	17th.	25th.	Day of Month.	3d.	11th.	19th.	27th.	35th.
	″	″	″	″		″	″	″	″	″
emidiameter . . .	9.00	9.12	9.24	9.35	Semidiam.	9.45	9.53	9.59	9.62	9.64
orizontal Parallax	1.02	1.04	1.05	1.06	Hor. Par. .	1.07	1.08	1.09	1.09	1.09

NOTE.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing; the n − indicates that north declinations are decreasing.

GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.	Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Me ian sa
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h
Jan. 0	20 49 49.31	+12.659	−18 23 56.8	+50.97	2 13.2	July 3	21 10 35.83	− 7.262	−17 1 11.4	−33.66	14
4	20 50 40.67	13.010	18 20 29.8	52.48	1 58.3	7	21 10 5.80	7.744	17 3 30.0	35.57	14
8	20 51 33.33	13.315	18 16 57.1	53.86	1 43.5	11	21 9 33.94	8.177	17 5 55.7	37.26	13
12	20 52 27.13	13.577	18 13 19.3	55.06	1 28.6	15	21 9 0.45	8.557	17 8 27.7	38.68	13
16	20 53 21.89	13.791	18 9 37.0	56.06	1 13.8	19	21 8 25.56	8.879	17 11 4.8	39.82	13
20	20 54 17.40	+13.951	−18 5 51.1	+56.86	0 59.0	23	21 7 49.50	− 9.142	−17 13 45.9	−40.69	13
24	20 55 13.44	14.059	18 2 2.4	57.46	0 44.2	27	21 7 12.51	9.346	17 16 30.0	41.30	12
28	20 56 9.81	14.120	17 58 11.6	57.87	0 29.4	31	21 6 34.81	9.494	17 19 16.0	41.65	12
Feb. 1	20 57 6.34	14.137	17 54 19.6	58.11	0 14.6	Aug. 4	21 5 56.64	9.582	17 22 2.9	41.76	12
5	20 58 2.85	14.110	17 50 27.1	58.15	23 56.1	8	21 5 18.24	9.606	17 24 49.7	41.57	11
9	20 58 59.16	+14.037	−17 46 34.8	+57.98	23 41.4	12	21 4 39.88	− 9.563	−17 27 35.1	−41.09	11
13	20 59 55.08	13.912	17 42 43.5	57.62	23 26.5	16	21 4 1.82	9.456	17 30 18.0	40.33	11
17	21 0 50.39	13.738	17 38 54.0	57.05	23 11.7	20	21 3 24.32	9.284	17 32 57.4	39.29	11
21	21 1 44.92	13.515	17 35 7.4	56.27	22 56.9	24	21 2 47.63	9.051	17 35 32.0	38.02	10
25	21 2 38.46	13.249	17 31 24.2	55.28	22 42.0	28	21 2 11.99	8.761	17 38 1.2	36.53	10
Mar. 1	21 3 30.86	+12.944	−17 27 45.4	+54.08	22 27.1	Sept. 1	21 1 37.62	− 8.415	−17 40 24.0	−34.81	10
5	21 4 21.96	12.601	17 24 11.7	52.73	22 12.3	5	21 1 4.75	8.011	17 42 39.4	32.86	10
9	21 5 11.61	12.216	17 20 43.8	51.18	21 57.4	9	21 0 33.61	7.549	17 44 46.6	30.70	9
13	21 5 59.63	11.787	17 17 22.5	49.43	21 42.5	13	21 0 4.43	7.032	17 46 44.7	28.32	9
17	21 6 45.85	11.316	17 14 8.6	47.48	21 27.5	17	20 59 37.42	6.466	17 48 32.9	25.75	9
21	21 7 30.11	+10.807	−17 11 2.9	+45.34	21 12.5	21	20 59 12.76	− 5.858	−17 50 10.5	−23.05	9
25	21 8 12.26	10.263	17 8 6.1	43.04	20 57.5	25	20 58 50.61	5.213	17 51 37.1	20.22	8
29	21 8 52.17	9.690	17 5 18.8	40.58	20 42.4	29	20 58 31.10	4.532	17 52 52.1	17.26	8
Apr. 2	21 9 29.73	9.090	17 2 41.6	37.97	20 27.3	Oct. 3	20 58 14.39	3.816	17 53 55.0	14.18	8
6	21 10 4.84	8.460	17 0 15.2	35.22	20 12.1	7	20 58 0.61	3.068	17 54 45.4	10.99	7
10	21 10 37.37	+ 7.797	−16 58 0.0	+32.34	19 56.9	11	20 57 49.88	− 2.295	−17 55 22.8	− 7.70	7
14	21 11 7.18	7.105	16 55 56.7	29.30	19 41.7	15	20 57 42.28	1.501	17 55 46.9	4.36	7
18	21 11 34.18	6.392	16 54 5.8	26.14	19 26.4	19	20 57 37.89	− 0.693	17 55 57.6	− 0.98	7
22	21 11 58.29	5.661	16 52 27.7	22.90	19 11.1	23	20 57 36.74	+ 0.122	17 55 54.7	+ 2.42	6
26	21 12 19.45	4.916	16 51 2.7	19.57	18 55.7	27	20 57 38.87	0.942	17 55 38.2	5.83	6
30	21 12 37.60	+ 4.158	−16 49 51.2	+16.18	18 40.2	31	20 57 44.28	+ 1.765	−17 55 8.0	+ 9.26	6
May 4	21 12 52.70	3.388	16 48 53.3	12.74	18 24.7	Nov. 4	20 57 52.99	2.590	17 54 24.1	12.68	6
8	21 13 4.69	2.608	16 48 9.3	9.25	18 9.2	8	20 58 5.00	3.413	17 53 26.6	16.08	5
12	21 13 13.55	1.820	16 47 39.3	5.73	17 53.6	12	20 58 20.28	4.224	17 52 15.5	19.46	5
16	21 13 19.24	1.028	16 47 23.5	+ 2.19	17 38.0	16	20 58 38.77	5.018	17 50 51.0	22.77	5
20	21 13 21.77	+ 0.238	−16 47 21.8	− 1.33	17 22.3	20	20 59 0.40	+ 5.792	−17 49 13.5	+25.98	5
24	21 13 21.15	− 0.545	16 47 34.1	4.81	17 6.5	24	20 59 25.08	6.543	17 47 23.4	29.11	4
28	21 13 17.42	1.316	16 48 0.2	8.22	16 50.7	28	20 59 52.72	7.274	17 45 20.9	32.16	4
June 1	21 13 10.64	2.072	16 48 39.7	11.56	16 34.9	Dec. 2	21 0 23.24	7.983	17 43 6.2	35.14	4
5	21 13 0.86	2.818	16 49 32.5	14.83	16 19.0	6	21 0 56.54	8.662	17 40 39.8	38.01	4
9	21 12 48.12	− 3.548	−16 50 38.3	−18.01	16 3.0	10	21 1 32.48	+ 9.305	−17 38 2.2	+40.77	3
13	21 12 32.51	4.251	16 51 56.5	21.05	15 47.0	14	21 2 10.93	9.912	17 35 13.8	43.38	3
17	21 12 14.15	4.925	16 53 26.5	23.94	15 31.0	18	21 2 51.73	10.478	17 32 15.3	45.84	3
21	21 11 53.16	5.566	16 55 7.8	26.66	15 14.9	22	21 3 34.71	11.005	17 29 7.3	48.14	3
25	21 11 29.67	6.172	16 56 59.5	29.18	14 58.8	26	21 4 19.72	11.495	17 25 50.4	50.30	2
29	21 11 3.84	− 6.737	−16 59 1.0	−31.52	14 42.6	30	21 5 6.62	+11.948	−17 22 25.2	+52.32	2
July 3	21 10 35.83	− 7.262	−17 1 11.4	−33.66	14 26.4	34	21 5 55.25	+12.356	−17 18 52.1	+54.18	2

Least semidiameter.	February 2, 1″.61	Least horizontal parallax.	February 2. 0″.47
Greatest semidiameter.	August 6, 1″.77	Greatest horizontal parallax.	August 6. 0″.4

NEPTUNE, 1915.

GREENWICH MEAN TIME.

onth and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
n. 0	8 6 45.63	−6.477	+19 52 26.8	+19.94	13 28.2	July 3	8 6 0.83	+8.861	+19 58 5.2	−25.70	1 24.1
4	8 6 19.29	6.682	19 53 47.8	20.55	13 12.0	7	8 6 36.57	9.005	19 56 21.2	26.30	1 8.9
8	8 5 52.22	6.846	19 55 10.9	21.02	12 55.9	11	8 7 12.83	9.118	19 54 35.0	26.81	0 53.8
12	8 5 24.58	6.965	19 56 35.7	21.36	12 39.7	15	8 7 49.47	9.197	19 52 46.9	27.22	0 38.7
16	8 4 56.57	7.034	19 58 1.6	21.56	12 23.5	19	8 8 26.37	9.246	19 50 57.4	27.53	0 23.6
20	8 4 28.38	−7.055	+19 59 28.0	+21.61	12 7.3	23	8 9 3.39	+9.261	+19 49 6.8	−27.75	0 8.5
24	8 4 0.19	7.030	20 0 54.3	21.51	11 51.1	27	8 9 40.41	9.246	19 47 15.6	27.88	23 49.6
28	8 3 32.20	6.960	20 2 19.9	21.29	11 34.9	31	8 10 17.32	9.203	19 45 24.0	27.91	23 34.5
b. 1	8 3 4.57	6.845	20 3 44.4	20.94	11 18.7	Aug. 4	8 10 53.99	9.130	19 43 32.4	27.86	23 19.4
5	8 2 37.50	6.687	20 5 7.3	20.47	11 2.6	8	8 11 30.31	9.024	19 41 41.3	27.71	23 4.2
9	8 2 11.13	−6.487	+20 6 28.0	+19.86	10 46.4	12	8 12 6.14	+8.886	+19 39 51.0	−27.43	22 49.1
13	8 1 45.65	6.243	20 7 46.0	19.14	10 30.2	16	8 12 41.36	8.715	19 38 2.0	27.06	22 33.9
17	8 1 21.24	5.957	20 9 0.9	18.31	10 14.1	20	8 13 15.83	8.514	19 36 14.7	26.57	22 18.8
21	8 0 58.05	5.631	20 10 12.2	17.36	9 58.0	24	8 13 49.44	8.285	19 34 29.6	25.97	22 3.6
25	8 0 36.24	5.271	20 11 19.6	16.32	9 41.9	28	8 14 22.07	8.029	19 32 47.0	25.29	21 48.4
ar. 1	8 0 15.93	−4.880	+20 12 22.7	+15.19	9 25.9	Sept. 1	8 14 53.64	+7.747	+19 31 7.4	−24.53	21 33.2
5	7 59 57.24	4.460	20 13 21.0	13.98	9 9.8	5	8 15 24.01	7.434	19 29 31.0	23.66	21 18.0
9	7 59 40.29	4.013	20 14 14.4	12.72	8 53.8	9	8 15 53.07	7.092	19 27 58.3	22.67	21 2.7
13	7 59 25.17	3.540	20 15 2.6	11.38	8 37.8	13	8 16 20.70	6.721	19 26 29.8	21.58	20 47.4
17	7 59 12.00	3.041	20 15 45.3	9.96	8 21.9	17	8 16 46.81	6.326	19 25 5.8	20.38	20 32.1
21	7 59 0.86	−2.524	+20 16 22.3	+ 8.50	8 6.0	21	8 17 11.29	+5.909	+19 23 46.8	−19.10	20 16.8
25	7 58 51.82	1.994	20 16 53.3	7.01	7 50.1	25	8 17 34.06	5.473	19 22 33.1	17.77	20 1.5
29	7 58 44.93	1.453	20 17 18.3	5.49	7 34.3	29	8 17 55.05	5.016	19 21 24.8	16.35	19 46.1
pr. 2	7 58 40.21	0.905	20 17 37.2	3.94	7 18.5	Oct. 3	8 18 14.16	4.536	19 20 22.5	14.84	19 30.6
6	7 58 37.70	−0.350	20 17 49.8	2.37	7 2.7	7	8 18 31.31	4.037	19 19 26.3	13.23	19 15.2
10	7 58 37.42	+0.211	+20 17 56.1	+ 0.79	6 47.0	11	8 18 46.43	+3.519	+19 18 36.7	−11.57	18 59.7
14	7 58 39.39	0.774	20 17 56.1	− 0.80	6 31.3	15	8 18 59.45	2.988	19 17 53.9	9.84	18 44.2
18	7 58 43.60	1.335	20 17 49.7	2.39	6 15.6	19	8 19 10.32	2.447	19 17 18.1	8.08	18 28.6
22	7 58 50.06	1.890	20 17 37.0	3.98	6 0.0	23	8 19 19.02	1.900	19 16 49.3	6.28	18 13.1
26	7 58 58.72	2.435	20 17 17.9	5.55	5 44.4	27	8 19 25.52	1.344	19 16 27.9	4.45	17 57.4
30	7 59 9.53	+2.970	+20 16 52.6	− 7.09	5 28.9	31	8 19 29.78	+0.782	+19 16 13.7	− 2.60	17 41.8
ay 4	7 59 22.46	3.494	20 16 21.2	8.60	5 13.4	Nov. 4	8 19 31.77	+0.214	19 16 7.1	− 0.71	17 26.1
8	7 59 37.46	4.006	20 15 43.8	10.09	4 57.9	8	8 19 31.50	−0.353	19 16 8.1	+ 1.18	17 10.3
12	7 59 54.49	4.504	20 15 0.5	11.57	4 42.4	12	8 19 28.96	0.911	19 16 16.5	3.05	16 54.6
16	8 0 13.47	4.984	20 14 11.3	13.01	4 27.0	16	8 19 24.21	1.463	19 16 32.4	4.88	16 38.7
20	8 0 34.33	+5.443	+20 13 16.5	−14.40	4 11.7	20	8 19 17.27	−2.005	+19 16 55.5	+ 6.68	16 22.9
24	8 0 56.98	5.879	20 12 16.2	15.72	3 56.3	24	8 19 8.19	2.535	19 17 25.7	8.45	16 7.0
28	8 1 21.33	6.292	20 11 10.8	16.99	3 41.0	28	8 18 57.01	3.051	19 18 3.0	10.17	15 51.1
une 1	8 1 47.28	6.682	20 10 0.3	18.22	3 25.7	Dec. 2	8 18 43.81	3.548	19 18 47.0	11.81	15 35.1
5	8 2 14.76	7.051	20 8 45.1	19.40	3 10.4	6	8 18 28.66	4.023	19 19 37.4	13.39	15 19.2
9	8 2 43.66	+7.395	+20 7 25.2	−20.52	2 55.2	10	8 18 11.66	−4.473	+19 20 34.0	+14.88	15 3.1
13	8 3 13.89	7.713	20 6 1.0	21.58	2 39.9	14	8 17 52.92	4.891	19 21 36.2	16.24	14 47.1
17	8 3 45.33	8.002	20 4 32.7	22.56	2 24.7	18	8 17 32.57	5.278	19 22 43.8	17.50	14 31.0
21	8 4 17.86	8.259	20 3 0.7	23.46	2 9.6	22	8 17 10.74	5.632	19 23 56.1	18.65	14 14.9
25	8 4 51.36	8.487	20 1 25.2	24.28	1 54.4	26	8 16 47.57	5.948	19 25 12.8	19.68	13 58.8
29	8 5 25.72	+8.689	+19 59 46.6	−25.02	1 39.2	30	8 16 23.21	−6.229	+19 26 33.4	+20.58	13 42.7
July 3	8 6 0.83	+8.861	+19 58 5.2	−25.70	1 24.1	34	8 15 57.79	−6.471	+19 27 57.3	+21.35	13 26.5

Greatest semidiameter,	January 19,	1″.33	Greatest horizontal parallax,	January 19,	0″.30
Least semidiameter,	July 23,	1″.25	Least horizontal parallax,	July 23,	0″.28

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth—	
							At Date.	At Interm diate Dat
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 1	272 18 49.5	2 48 49.6	+12 52.3	−4 57 48.5	−14 33.3	9.664 4806	0.158 6808	0.158 59
2	275 8 21.0	2 50 15.5	12 48.3	5 12 3.2	13 55.7	9.662 8071	0.158 4642	0.158 29
3	277 59 25.0	2 51 54.6	12 36.7	5 25 39.2	13 16.0	9.660 8699	0.158 0757	0.157 81
4	280 52 14.8	2 53 47.4	12 17.4	5 38 34.3	12 33.8	9.658 6679	0.157 5128	0.157 16
5	283 47 4.4	2 55 54.1	11 50.3	5 50 45.8	11 48.9	9.656 2001	0.156 7721	0.156 33
6	286 44 7.8	2 58 15.2	+11 15.4	−6 2 11.0	−11 1.1	9.653 4657	0.155 8497	0.155 3
7	289 43 39.8	3 0 51.2	10 32.8	6 12 47.0	10 10.2	9.650 4638	0.154 7411	0.154 11
8	292 45 55.5	3 3 42.7	9 42.5	6 22 30.4	9 15.8	9.647 1935	0.153 4411	0.152 71
9	295 51 10.7	3 6 50.3	8 44.7	6 31 17.4	8 17.5	9.643 6545	0.151 9434	0.151 11
10	298 59 41.8	3 10 14.6	7 39.7	6 39 4.0	7 15.0	9.639 8467	0.150 2411	0.149 31
11	302 11 45.8	3 13 56.3	+ 6 27.9	−6 45 45.9	− 6 7.9	9.635 7705	0.148 3270	0.147 28
12	305 27 40.4	3 17 56.0	5 9.7	6 51 18.1	4 55.7	9.631 4272	0.146 1918	0.145 03
13	308 47 44.0	3 22 14.4	3 45.7	6 55 35.4	3 37.9	9.626 8183	0.143 8261	0.142 55
14	312 12 15.6	3 26 52.2	2 16.8	6 58 31.9	2 14.0	9.621 9473	0.141 2199	0.139 82
15	315 41 35.1	3 31 50.1	+ 0 43.8	7 0 1.3	− 0 43.7	9.616 8181	0.138 3611	0.136 83
16	319 16 2.9	3 37 9.0	− 0 52.2	−6 59 57.0	+ 0 53.5	9.611 4367	0.135 2372	0.133 57
17	322 56 0.3	3 42 49.4	2 29.7	6 58 11.8	2 38.2	9.605 8107	0.131 8342	0.130 02
18	326 41 49.0	3 48 51.7	4 7.3	6 54 38.0	4 30.7	9.599 9502	0.128 1371	0.126 17
19	330 33 51.1	3 55 16.3	5 43.2	6 49 7.6	6 31.5	9.593 8680	0.124 1295	0.122 00
20	334 32 29.0	4 2 3.4	7 15.3	6 41 32.1	8 40.9	9.587 5798	0.119 7939	0.117 49
21	338 38 5.4	4 9 13.1	− 8 41.5	−6 31 42.9	+10 58.9	9.581 1055	0.115 1113	0.112 63
22	342 51 2.5	4 16 44.8	9 59.2	6 19 31.4	13 25.5	9.574 4691	0.110 0617	0.107 39
23	347 11 42.0	4 24 37.8	11 5.8	6 4 49.1	16 0.5	9.567 6996	0.104 6237	0.101 75
24	351 40 24.8	4 32 50.9	11 58.6	5 47 27.9	18 43.1	9.560 8313	0.098 7747	0.095 68
25	356 17 29.8	4 41 22.0	12 34.7	5 27 20.6	21 32.4	9.553 9048	0.092 4921	0.089 18
26	1 3 13.9	4 50 8.5	−12 51.4	−5 4 21.4	+24 26.6	9.546 9674	0.085 7522	0.082 20
27	5 57 50.9	4 59 7.0	12 46.4	4 38 26.3	27 23.8	9.540 0737	0.078 5314	0.074 73
28	11 1 30.5	5 8 13.0	12 17.8	4 9 33.7	30 21.2	9.533 2852	0.070 8070	0.066 74
29	16 14 17.7	5 17 21.0	11 24.2	3 37 45.1	33 15.1	9.526 6707	0.062 5574	0.058 22
30	21 36 11.1	5 26 24.4	10 5.3	3 3 6.1	36 1.2	9.520 3060	0.053 7633	0.049 15
31	27 7 2.3	5 35 15.3	− 8 22.1	−2 25 46.9	+38 34.7	9.514 2724	0.044 4094	0.039 51
Feb. 1	32 46 34.5	5 43 44.9	6 16.8	1 46 2.8	40 50.0	9.508 6556	0.034 4854	0.029 30
2	38 34 21.7	5 51 43.5	3 53.1	1 4 14.9	42 41.2	9.503 5433	0.023 9872	0.018 52
3	44 29 47.7	5 59 0.7	− 1 16.4	−0 20 50.2	44 2.7	9.499 0229	0.012 9197	0.007 17
4	50 32 5.7	6 5 25.8	+ 1 26.7	+0 23 38.8	44 49.0	9.495 1773	0.001 2983	9.995 28
5	56 40 18.4	6 10 48.3	+ 4 8.4	+1 8 34.6	+44 55.6	9.492 0820	9.989 1509	9.982 89
6	62 53 18.3	6 14 58.6	6 40.5	1 53 15.8	44 19.5	9.489 8012	9.976 5200	9.970 04
7	69 9 49.0	6 17 48.6	8 54.8	2 36 58.9	42 59.4	9.488 3840	9.963 4646	9.956 80
8	75 28 26.8	6 19 12.0	10 43.8	3 19 0.2	40 56.1	9.487 8619	9.950 0616	9.943 25
9	81 47 43.1	6 19 5.1	12 1.7	3 58 37.6	38 12.4	9.488 2467	9.936 4072	9.929 52
10	88 6 6.9	6 17 27.3	+12 44.4	+4 35 13.1	+34 53.2	9.489 5296	9.922 6162	9.915 71
11	94 22 8.1	6 14 20.7	12 50.1	5 8 14.3	31 5.1	9.491 6822	9.908 8231	9.901 97
12	100 34 20.2	6 9 50.3	12 19.7	5 37 16.0	26 55.4	9.494 6578	9.895 1799	9.888 46
13	106 41 23.1	6 4 3.7	11 16.0	6 2 0.6	22 32.2	9.498 3943	9.881 8525	9.875 36
14	112 42 5.4	5 57 10.7	9 43.6	6 22 18.5	18 3.4	9.502 8177	9.869 0182	9.862 84
15	118 35 26.0	5 49 22.2	+ 7 48.4	+6 38 7.8	+13 36.1	9.507 8458	9.856 8597	9.851 09
16	124 20 35.1	5 40 49.6	+ 5 37.0	+6 49 33.1	+ 9 16.4	9.513 3918	9.845 5587	9.840 28

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
b. 15	118 35 26.0	5 49 22.2	+ 7 48.4	+6 38 7.8	+13 36.1	9.507 8458	9.856 8597	9.851 0909
16	124 20 35.1	5 40 49.6	5 37.0	6 49 33.1	9 16.4	9.513 3918	9.845 5587	9.840 2844
17	129 56 54.4	5 31 44.5	3 16.0	6 56 44.7	5 9.4	9.519 3678	9.835 2881	9.830 5888
18	135 23 57.0	5 22 18.0	+ 0 51.7	6 59 57.3	+ 1 18.7	9.525 6877	9.826 2038	9.822 1487
19	140 41 26.6	5 12 40.1	− 1 30.2	6 59 28.3	− 2 13.3	9.532 2693	9.818 4372	9.815 0808
20	145 49 16.2	5 2 59.6	− 3 44.9	+6 55 37.4	− 5 25.1	9.539 0361	9.812 0886	9.809 4673
21	150 47 27.2	4 53 24.0	5 48.6	6 48 44.9	8 16.4	9.545 9181	9.807 2211	9.805 3517
22	155 36 7.7	4 43 59.5	7 38.6	6 39 11.2	10 47.6	9.552 8524	9.803 8584	9.802 7381
23	160 15 31.4	4 34 51.0	9 12.8	6 27 16.1	12 59.4	9.559 7837	9.801 9853	9.801 5923
24	164 45 56.3	4 26 2.3	10 30.3	6 13 18.5	14 52.9	9.566 6636	9.801 5497	9.801 8463
25	169 7 43.4	4 17 36.0	−11 30.6	+5 57 35.8	−16 29.7	9.573 4505	9.802 4693	9.803 4048
26	173 21 16.3	4 9 34.0	12 13.9	5 40 24.1	17 51.3	9.580 1091	9.804 6377	9.806 1522
27	177 26 59.8	4 1 57.3	12 40.7	5 21 57.7	18 59.2	9.586 6097	9.807 9318	9.809 9598
28	181 25 19.6	3 54 46.5	12 51.8	5 2 29.8	19 54.9	9.592 9274	9.812 2192	9.814 6930
ar. 1	185 16 41.5	3 48 1.5	12 48.5	4 42 11.7	20 39.7	9.599 0420	9.817 3647	9.820 2177
2	189 1 31.3	3 41 42.2	−12 31.9	+4 21 13.6	−21 15.0	9.604 9371	9.823 2358	9.826 4039
3	192 40 14.4	3 35 48.0	12 3.4	3 59 44.5	21 42.0	9.610 5994	9.829 7072	9.833 1314
4	196 13 15.6	3 30 18.2	11 24.4	3 37 52.0	22 1.8	9.616 0185	9.836 6631	9.840 2895
5	199 40 58.8	3 25 11.9	10 36.2	3 15 42.9	22 15.4	9.621 1864	9.843 9988	9.847 7796
6	203 3 47.0	3 20 28.2	9 40.1	2 53 23.0	22 23.6	9.626 0969	9.851 6214	9.855 5146
7	206 22 2.5	3 16 6.3	− 8 37.4	+2 30 57.2	−22 27.1	9.630 7456	9.859 4502	9.863 4200
8	209 36 6.5	3 12 5.0	7 29.3	2 8 30.0	22 26.6	9.635 1293	9.867 4164	9.871 4322
9	212 46 19.1	3 8 23.5	6 16.9	1 46 5.1	22 22.6	9.639 2460	9.875 4610	9.879 4970
10	215 52 59.8	3 5 0.9	5 1.4	1 23 45.7	22 15.7	9.643 0945	9.883 5348	9.887 5696
11	218 56 27.0	3 1 56.4	3 43.6	1 1 34.5	22 6.2	9.646 6743	9.891 5971	9.895 6134
12	221 56 58.5	2 59 9.2	− 2 24.6	+0 39 34.0	−21 54.4	9.649 9854	9.899 6150	9.903 5987
13	224 54 51.1	2 56 38.6	− 1 5.2	+0 17 46.3	21 40.6	9.653 0280	9.907 5618	9.911 5018
14	227 50 20.9	2 54 23.8	+ 0 13.9	−0 3 46.9	21 25.2	9.655 8029	9.915 4164	9.919 3036
15	230 43 43.6	2 52 24.2	1 31.9	0 25 3.8	21 8.3	9.658 3110	9.923 1618	9.926 9895
16	233 35 14.1	2 50 39.2	2 48.1	0 46 3.1	20 50.0	9.660 5532	9.930 7855	9.934 5486
17	236 25 6.7	2 49 8.3	+ 4 1.9	−1 6 43.5	−20 30.5	9.662 5305	9.938 2781	9.941 9730
18	239 13 35.3	2 47 51.2	5 12.7	1 27 3.7	20 9.8	9.664 2439	9.945 6327	9.949 2567
19	242 0 53.6	2 46 47.4	6 20.1	1 47 2.7	19 48.0	9.665 6944	9.952 8446	9.956 3962
20	244 47 14.6	2 45 56.7	7 23.5	2 6 39.4	19 25.1	9.666 8829	9.959 9111	9.963 3892
21	247 32 51.3	2 45 18.7	8 22.4	2 25 52.7	19 1.2	9.667 8099	9.966 8305	9.970 2350
22	250 17 56.2	2 44 53.2	+ 9 16.5	−2 44 41.5	−18 36.3	9.668 4761	9.973 6027	9.976 9337
23	253 2 41.9	2 44 40.0	10 5.3	3 3 4.9	18 10.3	9.668 8821	9.980 2282	9.983 4863
24	255 47 20.5	2 44 39.1	10 48.5	3 21 1.8	17 43.2	9.669 0280	9.986 7082	9.989 8941
25	258 32 4.3	2 44 50.5	11 25.7	3 38 31.0	17 15.0	9.668 9139	9.993 0444	9.996 1592
26	261 17 5.6	2 45 14.1	11 56.7	3 55 31.3	16 45.4	9.668 5397	9.999 2389	0.002 2837
27	264 2 36.6	2 45 49.9	+12 21.0	−4 12 1.3	−16 14.4	9.667 9053	0.005 2940	0.008 2699
28	266 48 49.5	2 46 38.0	12 38.6	4 27 59.7	15 42.1	9.667 0101	0.011 2118	0.014 1202
29	269 35 56.8	2 47 38.6	12 49.1	4 43 24.9	15 8.1	9.665 8536	0.016 9952	0.019 8370
30	272 24 11.0	2 48 52.0	12 52.3	4 58 15.3	14 32.3	9.664 4352	0.022 6460	0.025 4226
31	275 13 45.1	2 50 18.3	12 48.0	5 12 28.9	13 54.5	9.662 7540	0.028 1668	0.030 8790
Apr. 1	278 4 52.0	2 51 57.8	+12 36.2	−5 26 3.7	−13 14.6	9.660 8091	0.033 5594	0.036 2081
2	280 57 45.2	2 53 50.9	+12 16.7	−5 38 57.4	−12 32.3	9.658 5993	0.038 8253	0.041 4113

MERCURY.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distanc Earth—	
								At Date.	At Int diate
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr.	1	278 4 52.0	2 51 57.8	+12 36.2	−5 26 3.7	−13 14.6	9.660 8091	0.033 5594	0.036
	2	280 57 45.2	2 53 50.9	12 16.7	5 38 57.4	12 32.3	9.658 5993	0.038 8253	0.041
	3	283 52 38.5	2 55 58.0	11 49.3	5 51 7.5	11 47.4	9.656 1237	0.043 9661	0.046
	4	286 49 46.1	2 58 19.6	11 14.2	6 2 31.3	10 59.6	9.653 3814	0.048 9826	0.051 44
	5	289 49 22.7	3 0 56.1	10 31.3	6 13 5.7	10 8.6	9.650 3714	0.053 8756	0.056 27
	6	292 51 43.4	3 3 48.1	+ 9 40.8	−6 22 47.4	− 9 14.1	9.647 0931	0.058 6452	0.060 98
	7	295 57 4.1	3 6 56.2	8 42.8	6 31 32.6	8 15.7	9.643 5462	0.063 2911	0.065 5
	8	299 5 41.3	3 10 21.0	7 37.6	6 39 17.3	7 13.0	9.639 7306	0.067 8125	0.070 0
	9	302 17 51.9	3 14 3.1	6 25.6	6 45 57.1	6 5.7	9.635 6466	0.072 2079	0.074 35
	10	305 33 53.5	3 18 3.2	5 7.2	6 51 27.1	4 53.3	9.631 2953	0.076 4753	0.078 5
	11	308 54 4.6	3 22 22.2	+ 3 43.1	−6 55 41.9	− 3 35.3	9.626 6788	0.080 6121	0.082 6
	12	312 18 44.4	3 27 0.7	2 14.0	6 58 35.8	2 11.4	9.621 8001	0.084 6148	0.086 5
	13	315 48 12.7	3 31 59.3	+ 0 40.9	7 0 2.6	− 0 41.0	9.616 6634	0.088 4790	0.090 35
	14	319 22 50.0	3 37 18.8	− 0 55.1	6 59 55.4	+ 0 56.5	9.611 2745	0.092 1996	0.094 0
	15	323 2 57.4	3 42 59.8	2 32.7	6 58 7.0	2 41.5	9.605 6413	0.095 7703	0.097 49
	16	326 48 56.8	3 49 2.7	− 4 10.3	−6 54 29.8	+ 4 34.3	9.599 7740	0.099 1837	0.100 8
	17	330 41 10.2	3 55 27.9	5 46.1	6 48 55.7	6 35.4	9.593 6854	0.102 4318	0.103 9
	18	334 40 0.1	4 2 15.7	7 18.1	6 41 16.3	8 45.0	9.587 3914	0.105 5048	0.106 97
	19	338 45 49.1	4 9 26.0	8 44.0	6 31 22.9	11 3.2	9.580 9119	0.108 3917	0.109 76
	20	342 58 59.5	4 16 58.4	10 1.4	6 19 7.0	13 30.0	9.574 2712	0.111 0803	0.112 3
	21	347 19 53.0	4 24 52.1	−11 7.6	−6 4 20.0	+16 5.3	9.567 4982	0.113 5569	0.114 71
	22	351 48 50.3	4 33 5.7	11 59.9	5 46 53.9	18 48.2	9.560 6275	0.115 8062	0.116 84
	23	356 26 10.4	4 41 37.3	12 35.5	5 26 41.5	21 37.6	9.553 6999	0.117 8115	0.118 71
	24	1 12 10.0	4 50 24.2	12 51.6	5 3 37.1	24 31.9	9.546 7630	0.119 5548	0.120 32
	25	6 7 2.9	4 59 23.0	12 45.9	4 37 36.7	27 29.2	9.539 8714	0.121 0167	0.121 63
	26	11 10 58.7	5 8 29.2	−12 16.5	−4 8 38.7	+30 26.5	9.533 0868	0.122 1763	0.122 65
	27	16 24 2.0	5 17 37.2	11 22.2	3 36 44.9	33 20.2	9.526 4784	0.123 0119	0.123 30
	28	21 46 11.5	5 26 40.3	10 2.6	3 2 1.0	36 6.1	9.520 1221	0.123 5007	0.123 60
	29	27 17 18.4	5 35 30.7	8 18.7	2 24 37.2	38 39.1	9.514 0994	0.123 6197	0.123 53
	30	32 57 5.7	5 43 59.5	6 12.7	1 44 49.0	40 53.7	9.508 4961	0.123 3462	0.123 05
May	1	38 45 7.0	5 51 57.1	− 3 48.6	−1 2 57.8	+42 44.1	9.503 4000	0.122 6583	0.122 15
	2	44 40 46.0	5 59 12.9	− 1 11.6	−0 19 30.7	44 4.6	9.498 8982	0.121 5347	0.120 80
	3	50 43 15.5	6 5 36.3	+ 1 31.6	+0 24 59.7	44 49.7	9.495 0735	0.119 9569	0.118 00
	4	56 51 37.8	6 10 56.9	4 13.2	1 9 55.6	44 55.1	9.492 0013	0.117 9092	0.116 70
	5	63 4 45.2	6 15 5.1	6 44.8	1 54 35.7	44 17.7	9.489 7453	0.115 3790	0.113 93
	6	69 21 21.1	6 17 52.6	+ 8 58.5	+2 38 16.4	+42 56.3	9.488 3542	0.112 3579	0.110 66
	7	75 40 1.5	6 19 13.4	10 46.7	3 20 13.9	40 51.8	9.487 8588	0.108 8423	0.106 89
	8	81 59 17.7	6 19 3.8	12 3.5	3 59 46.4	38 7.0	9.488 2703	0.104 8333	0.102 64
	9	88 17 38.7	6 17 23.2	12 45.1	4 36 16.0	34 46.8	9.489 5794	0.100 3369	0.097 90
	10	94 33 34.5	6 14 14.0	12 49.7	5 9 10.4	30 57.7	9.491 7572	0.095 3640	0.092 70
	11	100 45 38.7	6 9 41.1	+12 18.3	+5 38 4.5	+26 47.5	9.494 7563	0.089 9293	0.087 04
	12	106 52 31.4	6 3 52.4	11 13.6	6 2 41.1	22 24.2	9.498 5142	0.084 0509	0.080 95
	13	112 53 1.6	5 56 57.7	9 40.5	6 22 51.0	17 55.4	9.502 9566	0.077 7507	0.074 44
	14	118 46 8.5	5 49 7.8	7 44.7	6 38 32.3	13 28.1	9.508 0012	0.071 0526	0.067 56
	15	124 31 2.5	5 40 34.1	5 32.8	6 49 49.8	9 8.7	9.513 5613	0.063 9815	0.060 31
	16	130 7 5.8	5 31 28.2	+ 3 11.6	+6 56 54.0	+ 5 2.2	9.519 5488	0.056 5636	0.052 73
	17	135 33 51.8	5 22 1.2	+ 0 47.3	+6 59 59.6	+ 1 12.0	9.525 8777	0.048 8253	0.044 84

MERCURY.

GREENWICH MEAN NOON.

ate.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
y 16	130 7 5.8	5 31 28.2	+ 3 11.6	+6 56 54.0	+ 5 2.2	9.519 5488	0.056 5636	0.052 7329
17	135 33 51.8	5 22 1.2	+ 0 47.3	6 59 59.6	+ 1 12.0	9.525 8777	0.048 8253	0.044 8440
18	140 51 4.4	5 12 23.0	− 1 34.4	6 59 24.2	− 2 19.4	9.532 4660	0.040 7923	0.036 6733
19	145 58 37.0	5 2 42.5	3 48.8	6 55 27.5	5 30.6	9.539 2373	0.032 4901	0.028 2458
20	150 56 31.0	4 53 7.1	5 52.2	6 48 29.8	8 21.3	9.546 1218	0.023 9433	0.019 5855
21	155 44 54.9	4 43 43.0	− 7 41.7	+6 38 51.5	−10 51.8	9.553 0570	0.015 1753	0.010 7154
22	160 24 2.4	4 34 35.1	9 15.5	6 26 52.5	13 3.0	9.559 9875	0.006 2086	0.001 6574
23	164 54 11.6	4 25 47.0	10 32.4	6 12 51.4	14 56.1	9.566 8653	9.997 0644	9.992 4321
24	169 15 43.8	4 17 21.4	11 32.2	5 57 5.7	16 32.5	9.573 6490	9.987 7630	9.983 0595
25	173 29 2.5	4 9 20.2	12 14.9	5 39 51.4	17 53.6	9.580 3033	9.978 3239	9.973 5586
26	177 34 32.5	4 1 44.3	−12 41.2	+5 21 23.0	−19 1.1	9.586 7988	9.968 7658	9.963 9477
27	181 32 39.6	3 54 34.2	12 51.9	5 1 53.3	19 56.4	9.593 1109	9.959 1066	9.954 2447
28	185 23 49.5	3 47 49.9	12 48.2	4 41 33.8	20 40.9	9.599 2193	9.949 3642	9.944 4672
29	189 8 28.0	3 41 31.4	12 31.2	4 20 34.7	21 16.0	9.605 1077	9.939 5560	9.934 6329
30	192 47 0.7	3 35 38.0	12 2.4	3 59 4.7	21 42.8	9.610 7630	9.929 7001	9.924 7597
31	196 19 52.1	3 30 8.8	−11 23.1	+3 37 11.5	−22 2.4	9.616 1748	9.919 8140	9.914 8654
ne 1	199 47 26.2	3 25 3.2	10 34.6	3 15 2.0	22 15.8	9.621 3351	9.909 9162	9.904 9689
2	203 10 6.1	3 20 20.2	9 38.3	2 52 41.8	22 23.8	9.626 2380	9.900 0260	9.895 0900
3	206 28 13.8	3 15 58.8	8 35.4	2 30 15.9	22 27.2	9.630 8789	9.890 1637	9.885 2497
4	209 42 10.6	3 11 58.1	7 27.1	2 7 48.7	22 26.6	9.635 2548	9.880 3509	9.875 4702
5	212 52 16.6	3 8 17.2	− 6 14.6	+1 45 23.9	−22 22.6	9.639 3637	9.870 6108	9.865 7758
6	215 58 51.3	3 4 55.2	4 59.0	1 23 4.6	22 15.5	9.643 2043	9.860 9684	9.856 1922
7	219 2 13.1	3 1 51.3	3 41.2	1 0 53.7	22 5.9	9.646 7762	9.851 4509	9.846 7482
8	222 2 39.6	2 59 4.6	2 22.2	0 38 53.5	21 54.1	9.650 0794	9.842 0879	9.837 4741
9	225 0 27.7	2 56 34.4	− 1 2.7	+0 17 6.2	21 40.3	9.653 1140	9.832 9112	9.828 4035
10	227 55 53.6	2 54 20.0	+ 0 16.3	−0 4 26.5	−21 24.8	9.655 8809	9.823 9554	9.819 5718
11	230 49 12.7	2 52 20.8	1 34.2	0 25 42.9	21 7.8	9.658 3811	9.815 2578	9.811 0183
12	233 40 40.0	2 50 36.3	2 50.4	0 46 41.7	20 49.4	9.660 6155	9.806 8587	9.802 7843
13	236 30 29.9	2 49 5.9	4 4.1	1 7 21.5	20 29.8	9.662 5850	9.798 8008	9.794 9139
14	239 18 56.3	2 47 49.2	5 14.9	1 27 41.1	20 9.1	9.664 2906	9.791 1295	9.787 4537
15	242 6 12.7	2 46 45.8	+ 6 22.1	−1 47 39.4	−19 47.3	9.665 7332	9.783 8926	9.780 4525
16	244 52 32.2	2 45 55.4	7 25.4	2 7 15.3	19 24.4	9.666 9138	9.777 1397	9.773 9607
17	247 38 7.7	2 45 17.8	8 24.2	2 26 27.9	19 0.5	9.667 8330	9.770 9218	9.768 0294
18	250 23 11.9	2 44 52.7	9 18.1	2 45 16.0	18 35.5	9.668 4914	9.765 2899	9.762 7096
19	253 7 57.2	2 44 39.9	10 6.7	3 3 38.6	18 9.4	9.668 8895	9.760 2948	9.758 0515
20	255 52 35.8	2 44 39.4	+10 49.7	−3 21 34.6	−17 42.3	9.669 0275	9.755 9859	9.754 1037
21	258 37 20.0	2 44 51.1	11 26.7	3 39 2.9	17 14.1	9.668 9057	9.752 4103	9.750 9110
22	261 22 22.0	2 45 15.0	11 57.5	3 56 2.3	16 44.5	9.668 5238	9.749 6106	9.748 5136
23	264 7 54.1	2 45 51.2	12 21.7	4 12 31.4	16 13.5	9.667 8815	9.747 6243	9.746 9464
24	266 54 8.5	2 46 39.7	12 39.0	4 28 28.8	15 41.1	9.666 9785	9.746 4831	9.746 2373
25	269 41 17.6	2 47 40.7	+12 49.3	−4 43 53.0	−15 7.0	9.665 8142	9.746 2111	9.746 4062
26	272 29 34.1	2 48 54.5	12 52.3	4 58 42.3	14 31.2	9.664 3878	9.746 8238	9.747 4644
27	275 19 10.8	2 50 21.1	12 47.8	5 12 54.7	13 53.4	9.662 6986	9.748 3279	9.749 4138
28	278 10 20.7	2 52 1.0	12 35.7	5 26 28.2	13 13.4	9.660 7455	9.750 7208	9.752 2471
29	281 3 17.3	2 53 54.6	12 15.9	5 39 20.6	12 31.0	9.658 5275	9.753 9905	9.755 9482
30	283 58 14.5	2 56 2.1	+11 48.4	−5 51 29.3	−11 46.0	9.656 0438	9.758 1167	9.760 4921
July 1	286 55 26.4	2 58 24.1	+11 13.0	−6 2 51.6	−10 58.1	9.653 2935	9.763 0703	9.765 [illegible]

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth—	
							At Date.	At Interm diate Dat
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 1	286 55 26.4	2 58 24.1	+11 13.0	−6 2 51.6	−10 58.1	9.653 2935	9.763 0703	9.765 8
2	289 55 7.7	3 1 1.1	10 29.9	6 13 24.4	10 7.0	9.650 2756	9.768 8154	9.771 97
3	292 57 33.8	3 3 53.6	9 39.1	6 23 4.4	9 12.4	9.646 9892	9.775 3104	9.778 82
4	296 3 0.3	3 7 2.1	8 40.9	6 31 47.9	8 13.9	9.643 4341	9.782 5081	9.786 35
5	299 11 43.6	3 10 27.4	7 35.5	6 39 30.7	7 11.0	9.639 6102	9.790 3577	9.794 51
6	302 24 0.9	3 14 10.1	+ 6 23.3	−6 46 8.4	− 6 3.5	9.635 5179	9.798 8061	9.803 23
7	305 40 9.9	3 18 10.9	5 4.7	6 51 36.1	4 50.9	9.631 1585	9.807 7987	9.812 48
8	309 0 29.0	3 22 30.4	3 40.4	6 55 48.5	3 32.8	9.626 5339	9.817 2806	9.822 18
9	312 25 17.3	3 27 9.4	2 11.2	6 58 39.8	2 8.7	9.621 6473	9.827 1971	9.832 30
10	315 54 54.6	3 32 8.7	+ 0 38.0	7 0 3.8	− 0 38.0	9.616 5028	9.837 4948	9.842 77
11	319 29 41.6	3 37 28.9	− 0 58.1	−6 59 53.6	+ 0 59.7	9.611 1063	9.848 1212	9.853 54
12	323 9 59.5	3 43 10.5	2 35.7	6 58 2.0	2 44.8	9.605 4658	9.859 0261	9.864 56
13	326 56 9.9	3 49 14.0	4 13.2	6 54 21.3	4 37.8	9.599 5915	9.870 1612	9.875 80
14	330 48 35.0	3 55 40.0	5 49.0	6 48 43.5	6 39.2	9.593 4963	9.881 4801	9.887 19
15	334 47 37.4	4 2 28.6	7 20.8	6 41 0.1	8 49.1	9.587 1963	9.892 9385	9.898 70
16	338 53 39.6	4 9 39.5	− 8 46.5	−6 31 2.5	+11 7.6	9.580 7115	9.904 4940	9.910 29
17	343 7 3.8	4 17 12.5	10 3.6	6 18 42.0	13 34.7	9.574 0661	9.916 1057	9.921 9
18	347 28 11.7	4 25 6.8	11 9.5	6 3 50.2	16 10.2	9.567 2895	9.927 7341	9.933 54
19	351 57 24.1	4 33 21.0	12 1.3	5 46 19.1	18 53.2	9.560 4164	9.939 3411	9.945 12
20	356 34 59.8	4 41 53.2	12 36.3	5 26 1.6	21 42.8	9.553 4877	9.950 8892	9.956 62
21	1 21 15.5	4 50 40.7	−12 51.8	−5 2 51.9	+24 37.4	9.546 5512	9.962 3414	9.968 0
22	6 16 24.8	4 59 39.8	12 45.4	4 36 46.0	27 34.7	9.539 6618	9.973 6613	9.979 26
23	11 20 37.3	5 8 46.0	12 15.2	4 7 42.6	30 31.9	9.532 8815	9.984 8124	9.990 31
24	16 33 57.4	5 17 53.8	11 20.1	3 35 43.5	33 25.4	9.526 2797	9.995 7586	0.001 14
25	21 56 23.4	5 26 56.7	9 59.7	3 0 54.4	36 10.9	9.519 9323	0.006 4639	0.011 71
26	27 27 46.5	5 35 46.6	− 8 15.1	−2 23 25.9	+38 43.4	9.513 9211	0.016 8920	0.021 99
27	33 7 49.4	5 44 14.7	6 8.5	1 43 33.7	40 57.4	9.508 3319	0.027 0074	0.031 93
28	38 56 5.4	5 52 11.2	3 43.9	1 1 39.1	42 47.0	9.503 2526	0.036 7753	0.041 51
29	44 51 57.7	5 59 25.6	− 1 6.6	−0 18 9.5	44 6.5	9.498 7702	0.046 1623	0.050 70
30	50 54 38.9	6 5 47.2	+ 1 36.6	+0 26 22.2	44 50.5	9.494 9675	0.055 1367	0.059 45
31	57 3 11.0	6 11 5.7	+ 4 18.0	+1 11 18.3	+44 54.6	9.491 9193	0.063 6693	0.067 76
Aug. 1	63 16 26.0	6 15 11.5	6 49.2	1 55 57.3	44 15.9	9.489 6888	0.071 7348	0.075 58
2	69 33 7.1	6 17 56.5	9 2.2	2 39 35.5	42 53.1	9.488 3245	0.079 3115	0.082 91
3	75 51 50.1	6 19 14.6	10 49.5	3 21 29.2	40 47.2	9.487 8568	0.086 3826	0.089 72
4	82 11 6.1	6 19 2.2	12 5.3	4 0 56.6	38 1.2	9.488 2960	0.092 9362	0.096 01
5	88 29 24.1	6 17 18.8	+12 45.8	+4 37 19.9	+34 40.1	9.489 6322	0.098 9659	0.101 78
6	94 45 14.2	6 14 6.8	12 49.3	5 10 7.3	30 50.4	9.491 8358	0.104 4707	0.107 02
7	100 57 10.1	6 9 31.6	12 16.8	5 38 53.8	26 39.7	9.494 8592	0.109 4550	0.111 75
8	107 3 52.3	6 3 40.8	11 11.2	6 3 22.4	22 16.0	9.498 6393	0.113 9277	0.115 97
9	113 4 9.8	5 56 44.2	9 37.2	6 23 24.0	17 47.1	9.503 1016	0.117 9021	0.119 70
10	118 57 2.3	5 48 52.7	+ 7 40.8	+6 38 57.1	+13 20.0	9.508 1634	0.121 3946	0.122 96
11	124 41 40.8	5 40 17.9	5 28.6	6 50 6.6	9 0.9	9.513 7378	0.124 4250	0.125 77
12	130 17 27.5	5 31 11.2	3 7.2	6 57 3.2	4 54.8	9.519 7370	0.127 0146	0.128 15
13	135 43 56.2	5 21 43.7	+ 0 42.9	7 0 1.7	+ 1 5.2	9.526 0750	0.129 1859	0.130 12
14	141 0 51.2	5 12 5.3	− 1 38.7	6 59 19.9	− 2 25.6	9.532 6700	0.130 9621	0.131 70
15	146 8 6.0	5 2 24.8	− 3 52.8	+6 55 17.3	− 5 36.2	9.539 4460	0.132 3665	0.132 93
16	151 5 42.4	4 52 49.6	− 5 55.8	+6 48 14.3	− 8 26.3	9.546 3330	0.133 4221	0.133 82

MERCURY.

GREENWICH MEAN NOON.

ate.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
g. 16	151 5 42.4	4 52 49.6	− 5 55.8	+6 48 14.3	− 8 26.3	9.546 3330	0.133 4221	0.133 8259
17	155 53 49.1	4 43 26.0	7 44.8	6 38 31.4	10 56.2	9.553 2689	0.134 1506	0.134 3987
18	160 32 39.9	4 34 18.7	9 18.1	6 26 28.3	13 6.9	9.560 1986	0.134 5728	0.134 6754
19	165 2 33.0	4 25 31.2	10 34.5	6 12 23.7	14 59.4	9.567 0742	0.134 7087	0.134 6751
20	169 23 49.7	4 17 6.3	11 33.8	5 56 35.1	16 35.2	9.573 8545	0.134 5766	0.134 4152
21	173 36 53.7	4 9 5.8	−12 16.0	+5 39 18.3	−17 55.9	9.580 5045	0.134 1929	0.133 9118
22	177 42 9.8	4 1 30.6	12 41.8	5 20 47.8	19 3.0	9.586 9949	0.133 5736	0.133 1799
23	181 40 3.6	3 54 21.4	12 52.0	5 1 16.4	19 58.0	9.593 3010	0.132 7323	0.132 2325
24	185 31 1.2	3 47 38.0	12 47.9	4 40 55.5	20 42.1	9.599 4029	0.131 6817	0.131 0814
25	189 15 28.2	3 41 20.2	12 30.5	4 19 55.3	21 16.8	9.605 2844	0.130 4329	0.129 7374
26	192 53 50.0	3 35 27.5	−12 1.3	+3 58 24.5	−21 43.4	9.610 9324	0.128 9960	0.128 2097
27	196 26 31.3	3 29 59.2	11 21.7	3 36 30.7	22 2.9	9.616 3366	0.127 3795	0.126 5064
28	199 53 56.1	3 24 54.3	10 32.9	3 14 20.8	22 16.1	9.621 4893	0.125 5911	0.124 6345
29	203 16 27.3	3 20 11.9	9 36.4	2 52 0.3	22 24.0	9.626 3843	0.123 6373	0.122 6002
30	206 34 27.0	3 15 51.1	8 33.3	2 29 34.3	22 27.3	9.631 0172	0.121 5236	0.120 4083
31	209 48 16.4	3 11 51.0	− 7 24.9	+2 7 7.1	−22 26.5	9.635 3850	0.119 2546	0.118 0631
pt. 1	212 58 15.6	3 8 10.7	6 12.3	1 44 42.4	22 22.3	9.639 4856	0.116 8340	0.115 5678
2	216 4 44.1	3 4 49.3	4 56.6	1 22 23.4	22 15.2	9.643 3179	0.114 2647	0.112 9250
3	219 8 0.2	3 1 45.9	3 38.8	1 0 12.8	22 5.6	9.646 8815	0.111 5489	0.110 1366
4	222 8 21.6	2 58 59.7	2 19.7	0 38 13.0	21 53.7	9.650 1764	0.108 6882	0.107 2039
5	225 6 5.1	2 56 30.0	− 1 0.3	+0 16 26.0	−21 39.9	9.653 2028	0.105 6836	0.104 1273
6	228 1 26.8	2 54 16.1	+ 0 18.7	−0 5 6.2	21 24.3	9.655 9617	0.102 5350	0.100 9067
7	230 54 42.3	2 52 17.4	1 36.6	0 26 22.1	21 7.2	9.658 4538	0.099 2422	0.097 5414
8	233 46 6.4	2 50 33.3	2 52.7	0 47 20.3	20 48.8	9.660 6799	0.095 8042	0.094 0304
9	236 35 53.5	2 49 3.3	4 6.4	1 7 59.4	20 29.2	9.662 6413	0.092 2197	0.090 3719
10	239 24 17.5	2 47 47.0	+ 5 17.0	−1 28 18.3	−20 8.5	9.664 3388	0.088 4867	0.086 5638
11	242 11 31.9	2 46 44.0	6 24.1	1 48 16.0	19 46.7	9.665 7733	0.084 6029	0.082 6036
12	244 57 49.9	2 45 54.1	7 27.2	2 7 51.3	19 23.7	9.666 9458	0.080 5656	0.078 4884
13	247 43 24.3	2 45 16.8	8 25.9	2 27 3.1	18 59.7	9.667 8570	0.076 3715	0.074 2146
14	250 28 27.7	2 44 52.0	9 19.6	2 45 50.4	18 34.7	9.668 5075	0.072 0171	0.069 7786
15	253 13 12.5	2 44 39.7	+10 8.1	−3 4 12.2	−18 8.7	9.668 8975	0.067 4985	0.065 1763
16	255 57 51.1	2 44 39.6	10 50.9	3 22 7.4	17 41.6	9.669 0275	0.062 8115	0.060 4034
17	258 42 35.7	2 44 51.6	11 27.8	3 39 34.9	17 13.2	9.668 8976	0.057 9515	0.055 4551
18	261 27 38.4	2 45 15.9	11 58.3	3 56 33.4	16 43.5	9.668 5075	0.052 9136	0.050 3264
19	264 13 11.6	2 45 52.5	12 22.3	4 13 1.5	16 12.5	9.667 8571	0.047 6928	0.045 0121
20	266 59 27.5	2 46 41.4	+12 39.4	−4 28 57.9	−15 40.0	9.666 9461	0.042 2837	0.039 5068
21	269 46 38.5	2 47 42.8	12 49.5	4 44 21.0	15 5.9	9.665 7736	0.036 6808	0.033 8049
22	272 34 57.3	2 48 57.0	12 52.2	4 59 9.1	14 30.0	9.664 3389	0.030 8784	0.027 9006
23	275 24 36.7	2 50 24.0	12 47.5	5 13 20.4	13 52.2	9.662 6415	0.024 8708	0.021 7883
24	278 15 49.7	2 52 4.3	12 35.2	5 26 52.7	13 12.1	9.660 6803	0.018 6524	0.015 4625
25	281 8 49.8	2 53 58.3	+12 15.2	−5 39 43.8	−12 29.6	9.658 4542	0.012 2178	0.008 9177
26	284 3 50.9	2 56 6.3	11 47.3	5 51 51.1	11 44.5	9.655 9622	0.005 5617	0.002 1491
27	287 1 7.3	2 58 28.8	11 11.8	6 3 11.9	10 56.6	9.653 2034	9.998 6794	9.995 1522
28	290 0 53.5	3 1 6.2	10 28.4	6 13 43.2	10 5.4	9.650 1770	9.991 5671	9.987 9236
29	293 3 24.9	3 3 59.2	9 37.4	6 23 21.5	9 10.6	9.646 8822	9.984 2217	9.980 4613
30	296 8 57.3	3 7 8.2	+ 8 39.0	−6 32 3.1	− 8 11.9	9.643 3186	9.976 6423	9.972 7647
Oct. 1	299 17 47.0	3 10 34.0	+ 7 33.4	−6 39 44.0	− 7 9.0	9.639 4862	9.968 8289	9.964 8354

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MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth—	
							At Date.	At Interm diate Dat
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 1	299 17 47.0	3 10 34.0	+ 7 33.4	−6 39 44.0	− 7 9.0	9.639 4862	9.968 8289	9.964 83
2	302 30 11.2	3 14 17.2	6 20.9	6 46 19.6	6 1.4	9.635 3857	9.960 7848	9.956 67
3	305 46 27.7	3 18 18.6	5 2.2	6 51 45.1	4 48.6	9.631 0180	9.952 5156	9.948 29
4	309 6 54.9	3 22 38.8	3 37.7	6 55 55.1	3 30.3	9.626 3851	9.944 0318	9.939 71
5	312 31 51.9	3 27 18.5	2 8.4	6 58 43.8	2 6.0	9.621 4902	9.935 3485	9.930 93
6	316 1 38.6	3 32 18.4	+ 0 35.0	−7 0 4.9	− 0 35.1	9.616 3377	9.926 4869	9.921 99
7	319 36 35.6	3 37 39.2	− 1 1.1	6 59 51.7	+ 1 2.8	9.610 9334	9.917 4756	9.912 9
8	323 17 4.2	3 43 21.5	2 38.7	6 57 56.9	2 48.2	9.605 2853	9.908 3530	9.903 76
9	327 3 26.0	3 49 25.8	4 16.2	6 54 12.7	4 41.5	9.599 4038	9.899 1686	9.894 57
10	330 56 3.2	3 55 52.4	5 51.9	6 48 31.1	6 43.1	9.593 3019	9.889 9848	9.885 41
11	334 55 18.4	4 2 41.7	− 7 23.6	−6 40 43.7	+ 8 53.3	9.586 9958	9.880 8799	9.876 38
12	339 1 34.1	4 9 53.4	8 49.1	6 30 41.8	11 12.1	9.580 5054	9.871 9489	9.867 58
13	343 15 12.5	4 17 27.1	10 5.9	6 18 16.7	13 39.5	9.573 8553	9.863 3065	9.859 13
14	347 36 35.4	4 25 22.0	11 11.3	6 3 20.1	16 15.1	9.567 0750	9.855 0875	9.851 18
15	352 6 3.2	4 33 36.8	12 2.6	5 45 43.9	18 58.4	9.560 1994	9.847 4470	9.843 89
16	356 43 55.0	4 42 9.5	−12 37.1	−5 25 21.1	+21 48.2	9.553 2696	9.840 5584	9.837 45
17	1 30 27.3	4 50 57.4	12 51.9	5 2 5.9	24 42.9	9.546 3337	9.834 6094	9.832 04
18	6 25 53.6	4 59 56.8	12 44.8	4 35 54.5	27 40.2	9.539 4467	9.829 7951	9.827 87
19	11 30 23.2	5 9 3.3	12 13.9	4 6 45.6	30 37.3	9.532 6708	9.826 3085	9.825 11
20	16 44 0.6	5 18 11.1	11 18.0	3 34 41.1	33 30.7	9.526 0757	9.824 3275	9.823 94
21	22 6 43.7	5 27 13.6	− 9 56.9	−2 59 46.9	+36 15.9	9.519 7376	9.824 0013	9.824 49
22	27 38 23.5	5 36 3.0	8 11.5	2 22 13.6	38 47.9	9.513 7382	9.825 4357	9.826 83
23	33 18 42.3	5 44 30.3	6 4.3	1 42 17.2	41 1.3	9.508 1636	9.828 6820	9.830 98
24	39 7 13.3	5 52 25.6	3 39.2	1 0 19.2	42 50.1	9.503 1017	9.833 7284	9.836 90
25	45 3 19.3	5 59 38.4	− 1 1.6	−0 16 47.1	44 8.5	9.498 6393	9.840 4986	9.844 40
26	51 6 12.5	6 5 58.2	+ 1 41.7	+0 27 46.0	+44 51.3	9.494 8591	9.848 8575	9.853 57
27	57 14 54.7	6 11 14.6	4 22.9	1 12 42.2	44 54.1	9.491 8357	9.858 6202	9.863 96
28	63 28 17.5	6 15 18.0	6 53.7	1 57 19.9	44 14.0	9.489 6319	9.869 5670	9.875 41
29	69 45 3.7	6 18 0.2	9 6.0	2 40 55.6	42 49.8	9.488 2955	9.881 4594	9.887 68
30	76 3 49.1	6 19 15.3	10 52.4	3 22 45.3	40 42.6	9.487 8562	9.894 0549	9.900 54
31	82 23 4.6	6 19 0.1	+12 7.1	+4 2 7.5	+37 55.4	9.488 3240	9.907 1196	9.913 759
Nov. 1	88 41 19.4	6 17 14.0	12 46.4	4 38 24.6	34 33.3	9.489 6881	9.920 4387	9.927 133
2	94 57 3.4	6 13 59.3	12 48.8	5 11 4.8	30 42.9	9.491 9182	9.933 8228	9.940 487
3	101 8 50.7	6 9 21.6	12 15.2	5 39 43.5	26 31.7	9.494 9663	9.947 1104	9.953 675
4	107 15 21.9	6 3 28.7	11 8.6	6 4 3.9	22 7.6	9.498 7690	9.960 1693	9.966 579
5	113 15 26.4	5 56 30.2	+ 9 33.9	+6 23 57.1	+17 38.6	9.503 2514	9.972 8951	9.979 107
6	119 8 4.1	5 48 37.1	7 36.9	6 39 21.8	13 11.8	9.508 3307	9.985 2092	9.991 103
7	124 52 26.3	5 40 1.1	5 24.3	6 50 23.3	8 53.1	9.513 9198	9.997 0549	0.002 789
8	130 27 55.8	5 30 53.6	3 2.7	6 57 12.3	4 47.4	9.519 9310	0.008 3942	0.013 866
9	135 54 6.7	5 21 25.6	+ 0 38.4	7 0 3.6	+ 0 58.3	9.526 2784	0.019 2056	0.024 410
10	141 10 43.4	5 11 47.0	− 1 43.0	+6 59 15.2	− 2 31.8	9.532 8803	0.029 4796	0.034 414
11	146 17 40.0	5 2 6.6	3 56.8	6 55 6.7	5 41.7	9.539 6606	0.039 2161	0.043 884
12	151 14 58.5	4 52 31.8	5 59.4	6 47 58.5	8 31.2	9.546 5500	0.048 4227	0.052 831
13	156 2 47.5	4 43 8.6	7 48.0	6 38 11.0	11 0.6	9.553 4864	0.057 1125	0.061 268
14	160 41 21.1	4 34 1.7	9 20.7	6 26 3.8	13 10.6	9.560 4151	0.065 3019	0.069 214
15	165 10 57.6	4 25 14.9	−10 36.6	+6 11 55.8	−15 2.5	9.567 2884	0.073 0100	0.076 689
16	169 31 58.5	4 16 50.9	−11 35.3	+5 56 4.2	−16 37.9	9.574 0652	0.080 2570	0.083 714

MERCURY.

GREENWICH MEAN NOON.

ate.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
v. 16	169 31 58.5	4 16 50.9	−11 35.3	+5 56 4.2	−16 37.9	9.574 0652	0.080 2570	0.083 7142
17	173 44 47.5	4 8 51.2	12 17.0	5 38 44.9	17 58.2	9.580 7106	0.087 0640	0.090 3091
18	177 49 49.4	4 1 16.8	12 42.3	5 20 12.3	19 4.9	9.587 1954	0.093 4522	0.096 4958
19	181 47 29.8	3 54 8.3	12 52.1	5 0 39.2	19 59.4	9.593 4954	0.099 4423	0.102 2943
20	185 38 14.7	3 47 25.7	12 47.5	4 40 17.0	20 43.3	9.599 5906	0.105 0543	0.107 7246
21	189 22 29.9	3 41 8.8	−12 29.8	+4 19 15.7	−21 17.9	9.605 4650	0.110 3075	0.112 8052
22	193 0 40.7	3 35 16.9	12 0.3	3 57 44.0	21 44.2	9.611 1056	0.115 2200	0.117 5540
23	196 33 11.8	3 29 49.2	11 20.3	3 35 49.7	22 3.3	9.616 5021	0.119 8093	0.121 9878
24	200 0 27.0	3 24 45.0	10 31.3	3 13 39.4	22 16.4	9.621 6466	0.124 0912	0.126 1216
25	203 22 49.4	3 20 3.3	9 34.6	2 51 18.7	22 24.2	9.626 5333	0.128 0807	0.129 9703
26	206 40 40.9	3 15 43.2	− 8 31.3	+2 28 52.6	−22 27.3	9.631 1580	0.131 7920	0.133 5472
27	209 54 22.8	3 11 43.8	7 22.7	2 6 25.5	22 26.4	9.635 5175	0.135 2374	0.136 8641
28	213 4 15.2	3 8 4.2	6 10.0	1 44 0.9	22 22.2	9.639 6097	0.138 4288	0.139 9328
29	216 10 37.4	3 4 43.3	4 54.2	1 21 42.1	22 15.0	9.643 4336	0.141 3773	0.142 7636
30	219 13 47.8	3 1 40.4	3 36.4	0 59 31.8	22 5.2	9.646 9887	0.144 0928	0.145 3659
c. 1	222 14 4.0	2 58 54.7	− 2 17.3	+0 37 32.4	−21 53.3	9.650 2751	0.146 5839	0.147 7480
2	225 11 42.8	2 56 25.5	− 0 57.8	+0 15 45.9	21 39.5	9.653 2932	0.148 8591	0.149 9181
3	228 7 0.3	2 54 12.1	+ 0 21.2	−0 5 45.9	21 23.9	9.656 0437	0.150 9257	0.151 8828
4	231 0 12.1	2 52 13.9	1 39.0	0 27 1.3	21 6.7	9.658 5275	0.152 7900	0.153 6482
5	233 51 33.0	2 50 30.3	2 55.0	0 47 58.9	20 48.2	9.660 7454	0.154 4580	0.155 2202
6	236 41 17.3	2 49 0.7	+ 4 8.6	−1 8 37.4	−20 28.6	9.662 6984	0.155 9352	0.156 [illegible]037
7	239 29 38.9	2 47 44.8	5 19.1	1 28 55.7	20 7.8	9.664 3876	0.157 2261	0.157 8030
8	242 16 51.4	2 46 42.2	6 26.1	1 48 52.7	19 45.9	9.665 8141	0.158 3347	0.158 8217
9	245 3 7.8	2 45 52.7	7 29.1	2 8 27.2	19 23.0	9.666 9785	0.159 2644	0.159 6631
10	247 48 41.0	2 45 15.9	8 27.6	2 27 38.3	18 59.0	9.667 8815	0.160 0180	0.160 3295
11	250 33 43.7	2 44 51.5	+ 9 21.2	−2 46 24.9	−18 33.9	9.668 5237	0.160 5979	0.160 8234
12	253 18 28.2	2 44 39.5	10 9.5	3 4 45.9	18 7.8	9.668 9057	0.161 0061	0.161 1462
13	256 3 6.8	2 44 39.7	10 52.2	3 22 40.2	17 40.6	9.669 0275	0.161 2437	0.161 2988
14	258 47 51.8	2 44 52.2	11 28.8	3 40 6.8	17 12.3	9.668 8894	0.161 3114	0.161 2816
15	261 32 55.3	2 45 16.9	11 59.2	3 57 4.3	16 42.7	9.668 4913	0.161 2094	0.161 0948
16	264 18 29.6	2 45 53.8	+12 23.0	−4 13 31.5	−16 11.6	9.667 8329	0.160 9376	0.160 7377
17	267 4 47.0	2 46 43.1	12 39.9	4 29 26.9	15 39.0	9.666 9138	0.160 4948	0.160 2089
18	269 52 0.0	2 47 44.9	12 49.7	4 44 49.0	15 4.8	9.665 7332	0.159 8796	0.159 5068
19	272 40 21.1	2 48 59.4	12 52.2	4 59 36.0	14 28.9	9.664 2903	0.159 0901	0.158 6292
20	275 30 3.1	2 50 26.9	12 47.3	5 13 46.1	13 51.0	9.662 5846	0.158 1237	0.157 5732
21	278 21 19.3	2 52 7.7	+12 34.7	−5 27 17.2	−13 10.8	9.660 6151	0.156 9772	0.156 3353
22	281 14 23.0	2 54 2.1	12 14.5	5 40 7.0	12 28.3	9.658 3807	0.155 6468	0.154 9113
23	284 9 28.1	2 56 10.5	11 46.4	5 52 12.9	11 43.1	9.655 8805	0.154 1281	0.153 2965
24	287 6 48.9	2 58 33.5	11 10.6	6 3 32.2	10 55.0	9.653 1134	0.152 4158	0.151 4853
25	290 6 40.1	3 1 11.4	10 27.0	6 14 1.9	10 3.7	9.652 0786	0.150 5043	0.149 4719
26	293 9 16.9	3 4 4.8	+ 9 35.8	−6 23 38.5	− 9 8.8	9.646 7754	0.148 3871	0.147 2490
27	296 14 55.2	3 7 14.4	8 37.1	6 32 18.3	8 10.0	9.643 2035	0.146 0566	0.144 8089
28	299 23 51.4	3 10 40.8	7 31.2	6 39 57.2	7 7.0	9.639 3628	0.143 5047	0.142 1430
29	302 36 22.6	3 14 24.6	6 18.6	6 46 30.7	5 59.3	9.635 2539	0.140 7224	0.139 2417
30	305 52 46.6	3 18 26.5	4 59.6	6 51 54.0	4 46.4	9.630 8779	0.137 6995	0.136 0945
31	309 13 21.9	3 22 47.3	+ 3 35.0	−6 56 1.6	− 3 27.9	9.626 2369	0.134 4252	0.132 6900
32	312 38 27.7	3 27 27.6	+ 2 5.5	−6 58 47.7	− 2 3.3	9.621 3339	0.130 8872	0.129 [illegible]

URANUS, 1915.

GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
Jan. 0	20 49 49.31	+12.659	−18 23 56.8	+50.97	2 13.2
4	20 50 40.67	13.010	18 20 29.8	52.48	1 58.3
8	20 51 33.33	13.315	18 16 57.1	53.86	1 43.5
12	20 52 27.13	13.577	18 13 19.3	55.06	1 28.6
16	20 53 21.89	13.791	18 9 37.0	56.06	1 13.8
20	20 54 17.40	+13.951	−18 5 51.1	+56.86	0 59.0
24	20 55 13.44	14.059	18 2 2.4	57.46	0 44.2
28	20 56 9.81	14.120	17 58 11.6	57.87	0 29.4
Feb. 1	20 57 6.34	14.137	17 54 19.6	58.11	0 14.6
5	20 58 2.85	14.110	17 50 27.1	58.15	23 56.1
9	20 58 59.16	+14.037	−17 46 34.8	+57.98	23 41.4
13	20 59 55.08	13.912	17 42 43.5	57.62	23 26.5
17	21 0 50.39	13.738	17 38 54.0	57.05	23 11.7
21	21 1 44.92	13.515	17 35 7.4	56.27	22 56.9
25	21 2 38.46	13.249	17 31 24.2	55.28	22 42.0
Mar. 1	21 3 30.86	+12.944	−17 27 45.4	+54.08	22 27.1
5	21 4 21.96	12.601	17 24 11.7	52.73	22 12.3
9	21 5 11.61	12.216	17 20 43.8	51.18	21 57.4
13	21 5 59.63	11.787	17 17 22.5	49.43	21 42.5
17	21 6 45.85	11.316	17 14 8.6	47.48	21 27.5
21	21 7 30.11	+10.807	−17 11 2.9	+45.34	21 12.5
25	21 8 12.26	10.263	17 8 6.1	43.04	20 57.5
29	21 8 52.17	9.690	17 5 18.8	40.58	20 42.4
Apr. 2	21 9 29.73	9.090	17 2 41.6	37.97	20 27.3
6	21 10 4.84	8.460	17 0 15.2	35.22	20 12.1
10	21 10 37.37	+ 7.797	−16 58 0.0	+32.34	19 56.9
14	21 11 7.18	7.105	16 55 56.7	29.30	19 41.7
18	21 11 34.18	6.392	16 54 5.8	26.14	19 26.4
22	21 11 58.29	5.661	16 52 27.7	22.90	19 11.1
26	21 12 19.45	4.916	16 51 2.7	19.57	18 55.7
30	21 12 37.60	+ 4.158	−16 49 51.2	+16.18	18 40.2
May 4	21 12 52.70	3.388	16 48 53.3	12.74	18 24.7
8	21 13 4.69	2.608	16 48 9.3	9.25	18 9.2
12	21 13 13.55	1.820	16 47 39.3	5.73	17 53.6
16	21 13 19.24	1.028	16 47 23.5	+ 2.19	17 38.0
20	21 13 21.77	+ 0.238	−16 47 21.8	− 1.33	17 22.3
24	21 13 21.15	− 0.545	16 47 34.1	4.81	17 6.5
28	21 13 17.42	1.316	16 48 0.2	8.22	16 50.7
June 1	21 13 10.64	2.072	16 48 39.7	11.56	16 34.9
5	21 13 0.86	2.818	16 49 32.5	14.83	16 19.0
9	21 12 48.12	− 3.548	−16 50 38.3	−18.01	16 3.0
13	21 12 32.51	4.251	16 51 56.5	21.05	15 47.0
17	21 12 14.15	4.925	16 53 26.5	23.94	15 31.0
21	21 11 53.16	5.566	16 55 7.8	26.66	15 14.9
25	21 11 20.67	6.172	16 56 59.5	29.18	14 58.8
29	21 11 3.84	− 6.737	−16 59 1.0	−31.52	14 42.6
July 3	21 10 35.83	− 7.262	−17 1 11.4	−33.66	14 26.4

Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	
	h m s	s	° ′ ″	″	
July 3	21 10 35.83	− 7.262	−17 1 11.4	−33.66	1
7	21 10 5.80	7.744	17 3 30.0	35.57	1
11	21 9 33.94	8.177	17 5 55.7	37.26	1
15	21 9 0.45	8.557	17 8 27.7	38.68	1
19	21 8 25.56	8.879	17 11 4.8	39.82	1
23	21 7 49.50	− 9.142	−17 13 45.9	−40.69	1
27	21 7 12.51	9.346	17 16 30.0	41.30	1
31	21 6 34.81	9.494	17 19 16.0	41.65	1
Aug. 4	21 5 56.64	9.582	17 22 2.9	41.76	1
8	21 5 18.24	9.606	17 24 49.7	41.57	1
12	21 4 39.88	− 9.563	−17 27 35.1	−41.09	1
16	21 4 1.82	9.456	17 30 18.0	40.33	1
20	21 3 24.32	9.284	17 32 57.4	39.29	1
24	21 2 47.63	9.051	17 35 32.0	38.02	10
28	21 2 11.99	8.761	17 38 1.2	36.53	10
Sept. 1	21 1 37.62	− 8.415	−17 40 24.0	−34.81	10
5	21 1 4.75	8.011	17 42 39.4	32.86	10
9	21 0 33.61	7.549	17 44 46.6	30.70	9
13	21 0 4.43	7.032	17 46 44.7	28.32	9
17	20 59 37.42	6.466	17 48 32.9	25.75	9
21	20 59 12.76	− 5.858	−17 50 10.5	−23.05	9
25	20 58 50.61	5.213	17 51 37.1	20.22	8
29	20 58 31.10	4.532	17 52 52.1	17.26	8
Oct. 3	20 58 14.39	3.816	17 53 55.0	14.18	8
7	20 58 0.61	3.068	17 54 45.4	10.99	7
11	20 57 49.88	− 2.295	−17 55 22.8	− 7.70	7
15	20 57 42.28	1.501	17 55 46.9	4.36	7
19	20 57 37.89	− 0.693	17 55 57.6	− 0.98	7
23	20 57 36.74	+ 0.122	17 55 54.7	+ 2.42	6
27	20 57 38.87	0.942	17 55 38.2	5.83	6
31	20 57 44.28	+ 1.765	−17 55 8.0	+ 9.26	6
Nov. 4	20 57 52.99	2.590	17 54 24.1	12.68	6
8	20 58 5.00	3.413	17 53 26.6	16.08	5 50.
12	20 58 20.28	4.224	17 52 15.5	19.46	5 35.
16	20 58 38.77	5.018	17 50 51.0	22.77	5 19.9
20	20 59 0.40	+ 5.792	−17 49 13.5	+25.98	5 4.
24	20 59 25.08	6.543	17 47 23.4	29.11	4 49.
28	20 59 52.72	7.274	17 45 20.9	32.16	4 33.9
Dec. 2	21 0 23.24	7.983	17 43 6.2	35.14	4 18.7
6	21 0 56.54	8.662	17 40 39.8	38.02	4 3.5
10	21 1 32.48	+ 9.305	−17 38 2.2	+40.77	3 48.4
14	21 2 10.93	9.912	17 35 13.8	43.38	3 33.3
18	21 2 51.73	10.478	17 32 15.3	45.84	3 18.3
22	21 3 34.71	11.005	17 29 7.3	48.14	3 3.3
26	21 4 19.72	11.495	17 25 50.4	50.30	2 48.
30	21 5 6.62	+11.948	−17 22 25.2	+52.32	2 33.3
34	21 5 55.25	+12.356	−17 18 52.1	+54.18	2 18.4

Least semidiameter, February 2, 1″.61
Greatest semidiameter, August 6, 1″.77

Least horizontal parallax, February 2, 0″.4
Greatest horizontal parallax, August 6, 0″.47

GREENWICH MEAN TIME.

	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.	Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
0	8 6 45.63	−6.477	+19 52 26.8	+19.94	13 28.2	July 3	8 6 0.83	+8.861	+19 58 5.2	−25.70	1 24.1
4	8 6 19.29	6.682	19 53 47.8	20.55	13 12.0	7	8 6 36.57	9.005	19 56 21.2	26.30	1 8.9
8	8 5 52.22	6.846	19 55 10.9	21.02	12 55.9	11	8 7 12.83	9.118	19 54 35.0	26.81	0 53.8
12	8 5 24.58	6.965	19 56 35.7	21.36	12 39.7	15	8 7 49.47	9.197	19 52 46.9	27.22	0 38.7
16	8 4 56.57	7.034	19 58 1.6	21.56	12 23.5	19	8 8 26.37	9.246	19 50 57.4	27.53	0 23.6
0	8 4 28.38	−7.055	+19 59 28.0	+21.61	12 7.3	23	8 9 3.39	+9.261	+19 49 6.8	−27.75	0 8.5
4	8 4 0.19	7.030	20 0 54.3	21.51	11 51.1	27	8 9 40.41	9.246	19 47 15.6	27.88	23 49.6
8	8 3 32.20	6.960	20 2 19.9	21.29	11 34.9	31	8 10 17.32	9.203	19 45 24.0	27.91	23 34.5
1	8 3 4.57	6.845	20 3 44.4	20.94	11 18.7	Aug. 4	8 10 53.99	9.130	19 43 32.4	27.86	23 19.4
5	8 2 37.50	6.687	20 5 7.3	20.47	11 2.6	8	8 11 30.31	9.024	19 41 41.3	27.71	23 4.2
9	8 2 11.13	−6.487	+20 6 28.0	+19.86	10 46.4	12	8 12 6.14	+8.886	+19 39 51.0	−27.43	22 49.1
13	8 1 45.65	6.243	20 7 46.0	19.14	10 30.2	16	8 12 41.36	8.715	19 38 2.0	27.06	22 33.9
17	8 1 21.24	5.957	20 9 0.9	18.31	10 14.1	20	8 13 15.83	8.514	19 36 14.7	26.57	22 18.8
21	8 0 58.05	5.631	20 10 12.2	17.36	9 58.0	24	8 13 49.44	8.285	19 34 29.6	25.97	22 3.6
25	8 0 36.24	5.271	20 11 19.6	16.32	9 41.9	28	8 14 22.07	8.029	19 32 47.0	25.29	21 48.4
r. 1	8 0 15.93	−4.880	+20 12 22.7	+15.19	9 25.9	Sept. 1	8 14 53.64	+7.747	+19 31 7.4	−24.53	21 33.2
5	7 59 57.24	4.460	20 13 21.0	13.98	9 9.8	5	8 15 24.01	7.434	19 29 31.0	23.66	21 18.0
9	7 59 40.29	4.013	20 14 14.4	12.72	8 53.8	9	8 15 53.07	7.092	19 27 58.3	22.67	21 2.7
13	7 59 25.17	3.540	20 15 2.6	11.38	8 37.8	13	8 16 20.70	6.721	19 26 29.8	21.58	20 47.4
17	7 59 12.00	3.041	20 15 45.3	9.96	8 21.9	17	8 16 46.81	6.326	19 25 5.8	20.38	20 32.1
21	7 59 0.86	−2.524	+20 16 22.3	+ 8.50	8 6.0	21	8 17 11.29	+5.909	+19 23 46.8	−19.10	20 16.8
25	7 58 51.82	1.994	20 16 53.3	7.01	7 50.1	25	8 17 34.06	5.473	19 22 33.1	17.77	20 1.5
29	7 58 44.93	1.453	20 17 18.3	5.49	7 34.3	29	8 17 55.05	5.016	19 21 24.8	16.35	19 46.1
pr. 2	7 58 40.21	0.905	20 17 37.2	3.94	7 18.5	Oct. 3	8 18 14.16	4.536	19 20 22.5	14.84	19 30.6
6	7 58 37.70	−0.350	20 17 49.8	2.37	7 2.7	7	8 18 31.31	4.037	19 19 26.3	13.23	19 15.2
10	7 58 37.42	+0.211	+20 17 56.1	+ 0.79	6 47.0	11	8 18 46.43	+3.519	+19 18 36.7	−11.57	18 59.7
14	7 58 39.39	0.774	20 17 56.1	− 0.80	6 31.3	15	8 18 59.45	2.988	19 17 53.9	9.84	18 44.2
18	7 58 43.60	1.335	20 17 49.7	2.39	6 15.6	19	8 19 10.32	2.447	19 17 18.1	8.08	18 28.6
22	7 58 50.06	1.890	20 17 37.0	3.98	6 0.0	23	8 19 19.02	1.900	19 16 49.3	6.28	18 13.1
26	7 58 58.72	2.435	20 17 17.9	5.55	5 44.4	27	8 19 25.52	1.344	19 16 27.9	4.45	17 57.4
30	7 59 9.53	+2.970	+20 16 52.6	− 7.09	5 28.9	31	8 19 29.78	+0.782	+19 16 13.7	− 2.60	17 41.8
y 4	7 59 22.46	3.494	20 16 21.2	8.60	5 13.4	Nov. 4	8 19 31.77	+0.214	19 16 7.1	− 0.71	17 26.1
8	7 59 37.46	4.006	20 15 43.8	10.09	4 57.9	8	8 19 31.50	−0.353	19 16 8.1	+ 1.18	17 10.3
12	7 59 54.49	4.504	20 15 0.5	11.57	4 42.4	12	8 19 28.96	0.911	19 16 16.5	3.05	16 54.6
16	8 0 13.47	4.984	20 14 11.3	13.01	4 27.0	16	8 19 24.21	1.463	19 16 32.4	4.88	16 38.7
20	8 0 34.33	+5.443	+20 13 16.5	−14.40	4 11.7	20	8 19 17.27	−2.005	+19 16 55.5	+ 6.68	16 22.9
24	8 0 56.98	5.879	20 12 16.2	15.72	3 56.3	24	8 19 8.19	2.535	19 17 25.7	8.45	16 7.0
28	8 1 21.33	6.292	20 11 10.8	16.99	3 41.0	28	8 18 57.01	3.051	19 18 3.0	10.17	15 51.1
ne 1	8 1 47.28	6.682	20 10 0.3	18.22	3 25.7	Dec. 2	8 18 43.81	3.548	19 18 47.0	11.81	15 35.1
5	8 2 14.76	7.051	20 8 45.1	19.40	3 10.4	6	8 18 28.66	4.023	19 19 37.4	13.39	15 19.2
9	8 2 43.66	+7.395	+20 7 25.2	−20.52	2 55.2	10	8 18 11.66	−4.473	+19 20 34.0	+14.88	15 3.1
13	8 3 13.89	7.713	20 6 1.0	21.58	2 39.9	14	8 17 52.92	4.891	19 21 36.2	16.24	14 47.1
17	8 3 45.33	8.002	20 4 32.7	22.56	2 24.7	18	8 17 32.57	5.278	19 22 43.8	17.50	14 31.0
21	8 4 17.86	8.259	20 3 0.7	23.46	2 9.6	22	8 17 10.74	5.632	19 23 56.1	18.65	14 14.9
25	8 4 51.36	8.487	20 1 25.2	24.28	1 54.4	26	8 16 47.57	5.948	19 25 12.8	19.68	13 58.8
29	8 5 25.72	+8.689	+19 59 46.6	−25.02	1 39.2	30	8 16 23.21	−6.229	+19 26 33.4	+20.58	13 42.7
uly 3	8 6 0.83	+8.861	+19 58 5.2	−25.70	1 24.1	34	8 15 57.79	−6.471	+19 27 57.3	+21.35	13 26.5

Greatest semidiameter,	January 19,	1″.33	Greatest horizontal parallax,	January 19,	0″.30
Least semidiameter,	July 23,	1″.25	Least horizontal parallax,	July 23,	0″.28

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance Earth—	
							At Date.	At Inte diate D
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 1	272 18 49.5	2 48 49.6	+12 52.3	−4 57 48.5	−14 33.3	9.664 4806	0.158 6808	0.158
2	275 8 21.0	2 50 15.5	12 48.3	5 12 3.2	13 55.7	9.662 8071	0.158 4642	0.158
3	277 59 25.0	2 51 54.6	12 36.7	5 25 39.2	13 16.0	9.660 8699	0.158 0757	0.157 8
4	280 52 14.8	2 53 47.4	12 17.4	5 38 34.3	12 33.8	9.658 6679	0.157 5128	0.157 1
5	283 47 4.4	2 55 54.1	11 50.3	5 50 45.8	11 48.9	9.656 2001	0.156 7721	0.156 3
6	286 44 7.8	2 58 15.2	+11 15.4	−6 2 11.0	−11 1.1	9.653 4657	0.155 8497	0.155 3
7	289 43 39.8	3 0 51.2	10 32.8	6 12 47.0	10 10.2	9.650 4638	0.154 7411	0.154 1
8	292 45 55.5	3 3 42.7	9 42.5	6 22 30.4	9 15.8	9.647 1935	0.153 4411	0.152 7
9	295 51 10.7	3 6 50.3	8 44.7	6 31 17.4	8 17.5	9.643 6545	0.151 9434	0.151 1
10	298 59 41.8	3 10 14.6	7 39.7	6 39 4.0	7 15.0	9.639 8467	0.150 2411	0.149 3
11	302 11 45.8	3 13 56.3	+ 6 27.9	−6 45 45.9	− 6 7.9	9.635 7705	0.148 3270	0.147 2
12	305 27 40.4	3 17 56.0	5 9.7	6 51 18.1	4 55.7	9.631 4272	0.146 1918	0.145 0
13	308 47 44.0	3 22 14.4	3 45.7	6 55 35.4	3 37.9	9.626 8183	0.143 8261	0.142 5
14	312 12 15.6	3 26 52.2	2 16.8	6 58 31.9	2 14.0	9.621 9473	0.141 2199	0.139 8
15	315 41 35.1	3 31 50.1	+ 0 43.8	7 0 1.3	− 0 43.7	9.616 8181	0.138 3611	0.136 8
16	319 16 2.9	3 37 9.0	− 0 52.2	−6 59 57.0	+ 0 53.5	9.611 4367	0.135 2372	0.133 57
17	322 56 0.3	3 42 49.4	2 29.7	6 58 11.8	2 38.2	9.605 8107	0.131 8342	0.130 0
18	326 41 49.0	3 48 51.7	4 7.3	6 54 38.0	4 30.7	9.599 9502	0.128 1371	0.126 17
19	330 33 51.1	3 55 16.3	5 43.2	6 49 7.6	6 31.5	9.593 8680	0.124 1295	0.122 0
20	334 32 29.0	4 2 3.4	7 15.3	6 41 32.1	8 40.9	9.587 5798	0.119 7939	0.117 4
21	338 38 5.4	4 9 13.1	− 8 41.5	−6 31 42.9	+10 58.9	9.581 1055	0.115 1113	0.112 0
22	342 51 2.5	4 16 44.8	9 59.2	6 19 31.4	13 25.5	9.574 4691	0.110 0617	0.107 3
23	347 11 42.0	4 24 37.8	11 5.8	6 4 49.1	16 0.5	9.567 6996	0.104 6237	0.101 7
24	351 40 24.8	4 32 50.9	11 58.6	5 47 27.9	18 43.1	9.560 8313	0.098 7747	0.095 6
25	356 17 29.8	4 41 22.0	12 34.7	5 27 20.6	21 32.4	9.553 9048	0.092 4921	0.089 1
26	1 3 13.9	4 50 8.5	−12 51.4	−5 4 21.4	+24 26.6	9.546 9674	0.085 7522	0.082 20
27	5 57 50.9	4 59 7.0	12 46.4	4 38 26.3	27 23.8	9.540 0737	0.078 5314	0.074 7
28	11 1 30.5	5 8 13.0	12 17.8	4 9 33.7	30 21.2	9.533 2852	0.070 8070	0.066 7
29	16 14 17.7	5 17 21.0	11 24.2	3 37 45.1	33 15.1	9.526 6707	0.062 5574	0.058 2
30	21 36 11.1	5 26 24.4	10 5.3	3 3 6.1	36 1.2	9.520 3060	0.053 7633	0.049 15
31	27 7 2.3	5 35 15.3	− 8 22.1	−2 25 46.9	+38 34.7	9.514 2724	0.044 4094	0.039 51
Feb. 1	32 46 34.5	5 43 44.9	6 16.8	1 46 2.8	40 50.0	9.508 6556	0.034 4854	0.029 30
2	38 34 21.7	5 51 43.5	3 53.1	1 4 14.9	42 41.2	9.503 5433	0.023 9872	0.018 52
3	44 29 47.7	5 59 0.7	− 1 16.4	−0 20 50.2	44 2.7	9.499 0229	0.012 9197	0.007 17
4	50 32 5.7	6 5 25.8	+ 1 26.7	+0 23 38.8	44 49.0	9.495 1773	0.001 2983	9.995 28
5	56 40 18.4	6 10 48.3	+ 4 8.4	+1 8 34.6	+44 55.6	9.492 0820	9.989 1509	9.982 8
6	62 53 18.3	6 14 58.6	6 40.5	1 53 15.8	44 19.5	9.489 8012	9.976 5200	9.970 04
7	69 9 49.0	6 17 48.6	8 54.8	2 36 58.9	42 59.4	9.488 3840	9.963 4646	9.956 80
8	75 28 26.8	6 19 12.0	10 43.8	3 19 0.2	40 56.1	9.487 8619	9.950 0616	9.943 2
9	81 47 43.1	6 19 5.1	12 1.7	3 58 37.6	38 12.4	9.488 2467	9.936 4072	9.929 52
10	88 6 6.9	6 17 27.3	+12 44.4	+4 35 13.1	+34 53.2	9.489 5296	9.922 6162	9.915 7
11	94 22 8.1	6 14 20.7	12 50.1	5 8 14.3	31 5.1	9.491 6822	9.908 8231	9.901 97
12	100 34 20.2	6 9 50.3	12 19.7	5 37 16.0	26 55.4	9.494 6578	9.895 1799	9.888 40
13	106 41 23.1	6 4 3.7	11 16.0	6 2 0.6	22 32.2	9.498 3943	9.881 8525	9.875 36
14	112 42 5.4	5 57 10.7	9 43.6	6 22 18.5	18 3.4	9.502 8177	9.869 0182	9.862 84
15	118 35 26.0	5 49 22.2	+ 7 48.4	+6 38 7.8	+13 36.1	9.507 8458	9.856 8597	9.851 00
16	124 20 35.1	5 40 49.6	+ 5 37.0	+6 49 33.1	+ 9 16.4	9.513 3918	9.845 5587	9.840 28

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
b. 15	118 35 26.0	5 49 22.2	+ 7 48.4	+6 38 7.8	+13 36.1	9.507 8458	9.856 8597	9.851 0909
16	124 20 35.1	5 40 49.6	5 37.0	6 49 33.1	9 16.4	9.513 3918	9.845 5587	9.840 2844
17	129 56 54.4	5 31 44.5	3 16.0	6 56 44.7	5 9.4	9.519 3678	9.835 2881	9.830 5888
18	135 23 57.0	5 22 18.0	+ 0 51.7	6 59 57.3	+ 1 18.7	9.525 6877	9.826 2038	9.822 1487
19	140 41 26.6	5 12 40.1	− 1 30.2	6 59 28.3	− 2 13.3	9.532 2693	9.818 4372	9.815 0808
20	145 49 16.2	5 2 59.6	− 3 44.9	+6 55 37.4	− 5 25.1	9.539 0361	9.812 0886	9.809 4673
21	150 47 27.2	4 53 24.0	5 48.6	6 48 44.9	8 16.4	9.545 9181	9.807 2211	9.805 3517
22	155 36 7.7	4 43 59.5	7 38.6	6 39 11.2	10 47.6	9.552 8524	9.803 8584	9.802 7381
23	160 15 31.4	4 34 51.0	9 12.8	6 27 16.1	12 59.4	9.559 7837	9.801 9853	9.801 5923
24	164 45 56.3	4 26 2.3	10 30.3	6 13 18.5	14 52.9	9.566 6636	9.801 5497	9.801 8463
25	169 7 43.4	4 17 36.0	−11 30.6	+5 57 35.8	−16 29.7	9.573 4505	9.802 4693	9.803 4048
26	173 21 16.3	4 9 34.0	12 13.9	5 40 24.1	17 51.3	9.580 1091	9.804 6377	9.806 1522
27	177 26 59.8	4 1 57.3	12 40.7	5 21 57.7	18 59.2	9.586 6097	9.807 9318	9.809 9598
28	181 25 19.6	3 54 46.5	12 51.8	5 2 29.8	19 54.9	9.592 9274	9.812 2192	9.814 6930
ar. 1	185 16 41.5	3 48 1.5	12 48.5	4 42 11.7	20 39.7	9.599 0420	9.817 3647	9.820 2177
2	189 1 31.3	3 41 42.2	−12 31.9	+4 21 13.6	−21 15.0	9.604 9371	9.823 2358	9.826 4039
3	192 40 14.4	3 35 48.0	12 3.4	3 59 44.5	21 42.0	9.610 5994	9.829 7072	9.833 1314
4	196 13 15.6	3 30 18.2	11 24.4	3 37 52.0	22 1.8	9.616 0185	9.836 6631	9.840 2895
5	199 40 58.8	3 25 11.9	10 36.2	3 15 42.9	22 15.4	9.621 1864	9.843 9988	9.847 7796
6	203 3 47.0	3 20 28.2	9 40.1	2 53 23.0	22 23.6	9.626 0969	9.851 6214	9.855 5146
7	206 22 2.5	3 16 6.3	− 8 37.4	+2 30 57.2	−22 27.1	9.630 7456	9.859 4502	9.863 4200
8	209 36 6.5	3 12 5.0	7 29.3	2 8 30.0	22 26.6	9.635 1293	9.867 4164	9.871 4322
9	212 46 19.1	3 8 23.5	6 16.9	1 46 5.1	22 22.6	9.639 2460	9.875 4610	9.879 4970
10	215 52 59.8	3 5 0.9	5 1.4	1 23 45.7	22 15.7	9.643 0945	9.883 5348	9.887 5696
11	218 56 27.0	3 1 56.4	3 43.6	1 1 34.5	22 6.2	9.646 6743	9.891 5971	9.895 6134
12	221 56 58.5	2 59 9.2	− 2 24.6	+0 39 34.0	−21 54.4	9.649 9854	9.899 6150	9.903 5987
13	224 54 51.1	2 56 38.6	− 1 5.2	+0 17 46.3	21 40.6	9.653 0280	9.907 5618	9.911 5018
14	227 50 20.9	2 54 23.8	+ 0 13.9	−0 3 46.9	21 25.2	9.655 8029	9.915 4164	9.919 3036
15	230 43 43.6	2 52 24.2	1 31.9	0 25 3.8	21 8.3	9.658 3110	9.923 1618	9.926 9895
16	233 35 14.1	2 50 39.2	2 48.1	0 46 3.1	20 50.0	9.660 5532	9.930 7855	9.934 5486
17	236 25 6.7	2 49 8.3	+ 4 1.9	−1 6 43.5	−20 30.5	9.662 5305	9.938 2781	9.941 9730
18	239 13 35.3	2 47 51.2	5 12.7	1 27 3.7	20 9.8	9.664 2439	9.945 6327	9.949 2567
19	242 0 53.6	2 46 47.4	6 20.1	1 47 2.7	19 48.0	9.665 6944	9.952 8446	9.956 3962
20	244 47 14.6	2 45 56.7	7 23.5	2 6 39.4	19 25.1	9.666 8829	9.959 9111	9.963 3892
21	247 32 51.3	2 45 18.7	8 22.4	2 25 52.7	19 1.2	9.667 8099	9.966 8305	9.970 2350
22	250 17 56.2	2 44 53.2	+ 9 16.5	−2 44 41.5	−18 36.3	9.668 4761	9.973 6027	9.976 9337
23	253 2 41.9	2 44 40.0	10 5.3	3 3 4.9	18 10.3	9.668 8821	9.980 2282	9.983 4863
24	255 47 20.5	2 44 39.1	10 48.5	3 21 1.8	17 43.2	9.669 0280	9.986 7082	9.989 8941
25	258 32 4.3	2 44 50.5	11 25.7	3 38 31.0	17 15.0	9.668 9139	9.993 0444	9.996 1592
26	261 17 5.6	2 45 14.1	11 56.7	3 55 31.3	16 45.4	9.668 5397	9.999 2389	0.002 2837
27	264 2 36.6	2 45 49.9	+12 21.0	−4 12 1.3	−16 14.4	9.667 9053	0.005 2940	0.008 2699
28	266 48 49.5	2 46 38.0	12 38.6	4 27 59.7	15 42.1	9.667 0101	0.011 2118	0.014 1202
29	269 35 56.8	2 47 38.6	12 49.1	4 43 24.9	15 8.1	9.665 8536	0.016 9952	0.019 8370
30	272 24 11.0	2 48 52.0	12 52.3	4 58 15.3	14 32.3	9.664 4352	0.022 6460	0.025 4226
31	275 13 45.1	2 50 18.3	12 48.0	5 12 28.9	13 54.5	9.662 7540	0.028 1668	0.030 8790
Apr. 1	278 4 52.0	2 51 57.8	+12 36.2	−5 26 3.7	−13 14.6	9.660 8091	0.033 5594	0.036 2081
2	280 57 45.2	2 53 50.9	+12 16.7	−5 38 57.4	−12 32.3	9.658 5993	0.038 8253	0.041 4113

MERCURY.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
								At Date.	At Intermediate Date.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr.	1	278 4 52.0	2 51 57.8	+12 36.2	−5 26 3.7	−13 14.6	9.660 8091	0.033 5594	0.036 20
	2	280 57 45.2	2 53 50.9	12 16.7	5 38 57.4	12 32.3	9.658 5993	0.038 8253	0.041 411
	3	283 52 38.5	2 55 58.0	11 49.3	5 51 7.5	11 47.4	9.656 1237	0.043 9661	0.046 48
	4	286 49 46.1	2 58 19.6	11 14.2	6 2 31.3	10 59.6	9.653 3814	0.048 9826	0.051 44
	5	289 49 22.7	3 0 56.1	10 31.3	6 13 5.7	10 8.6	9.650 3714	0.053 8756	0.056 27
	6	292 51 43.4	3 3 48.1	+ 9 40.8	−6 22 47.4	− 9 14.1	9.647 0931	0.058 6452	0.060 98
	7	295 57 4.1	3 6 56.2	8 42.8	6 31 32.6	8 15.7	9.643 5462	0.063 2911	0.065 507
	8	299 5 41.3	3 10 21.0	7 37.6	6 39 17.3	7 13.0	9.639 7306	0.067 8125	0.070 020
	9	302 17 51.9	3 14 3.1	6 25.6	6 45 57.1	6 5.7	9.635 6466	0.072 2079	0.074 357
	10	305 33 53.5	3 18 3.2	5 7.2	6 51 27.1	4 53.3	9.631 2953	0.076 4753	0.078 560
	11	308 54 4.6	3 22 22.2	+ 3 43.1	−6 55 41.9	− 3 35.3	9.626 6788	0.080 6121	0.082 630
	12	312 18 44.4	3 27 0.7	2 14.0	6 58 35.8	2 11.4	9.621 8001	0.084 6148	0.086 564
	13	315 48 12.7	3 31 59.3	+ 0 40.9	7 0 2.6	− 0 41.0	9.616 6634	0.088 4790	0.090 357
	14	319 22 50.0	3 37 18.8	− 0 55.1	6 59 55.4	+ 0 56.5	9.611 2745	0.092 1996	0.094 004
	15	323 2 57.4	3 42 59.8	2 32.7	6 58 7.0	2 41.5	9.605 6413	0.095 7703	0.097 497
	16	326 48 56.8	3 49 2.7	− 4 10.3	−6 54 29.8	+ 4 34.3	9.599 7740	0.099 1837	0.100 828
	17	330 41 10.2	3 55 27.9	5 46.1	6 48 55.7	6 35.4	9.593 6854	0.102 4318	0.103 990
	18	334 40 0.1	4 2 15.7	7 18.1	6 41 16.3	8 45.0	9.587 3914	0.105 5048	0.106 972
	19	338 45 49.1	4 9 26.0	8 44.0	6 31 22.9	11 3.2	9.580 9119	0.108 3917	0.109 7016
	20	342 58 59.5	4 16 58.4	10 1.4	6 19 7.0	13 30.0	9.574 2712	0.111 0803	0.112 3460
	21	347 19 53.0	4 24 52.1	−11 7.6	−6 4 20.0	+16 5.3	9.567 4982	0.113 5569	0.114 7110
	22	351 48 50.3	4 33 5.7	11 59.9	5 46 53.9	18 48.2	9.560 6275	0.115 8062	0.116 8404
	23	356 26 10.4	4 41 37.3	12 35.5	5 26 41.5	21 37.6	9.553 6999	0.117 8115	0.118 7171
	24	1 12 10.0	4 50 24.2	12 51.6	5 3 37.1	24 31.9	9.546 7630	0.119 5548	0.120 3221
	25	6 7 2.9	4 59 23.0	12 45.9	4 37 36.7	27 29.2	9.539 8714	0.121 0167	0.121 6356
	26	11 10 58.7	5 8 29.2	−12 16.5	−4 8 38.7	+30 26.5	9.533 0868	0.122 1763	0.122 6360
	27	16 24 2.0	5 17 37.2	11 22.2	3 36 44.9	33 20.2	9.526 4784	0.123 0119	0.123 3011
	28	21 46 11.5	5 26 40.3	10 2.6	3 2 1.0	36 6.1	9.520 1221	0.123 5007	0.123 6078
	29	27 17 18.4	5 35 30.7	8 18.7	2 24 37.2	38 39.1	9.514 0994	0.123 6197	0.123 5334
	30	32 57 5.7	5 43 59.5	6 12.7	1 44 49.0	40 53.7	9.508 4961	0.123 3462	0.123 0554
May	1	38 45 7.0	5 51 57.1	− 3 48.6	−1 2 57.8	+42 44.1	9.503 4000	0.122 6583	0.122 1522
	2	44 40 46.0	5 59 12.9	− 1 11.6	−0 19 30.7	44 4.6	9.498 8982	0.121 5347	0.120 8036
	3	50 43 15.5	6 5 36.3	+ 1 31.6	+0 24 59.7	44 49.7	9.495 0735	0.119 9569	0.118 9027
	4	56 51 37.8	6 10 56.9	4 13.2	1 9 55.6	44 55.1	9.492 0013	0.117 9092	0.116 7050
	5	63 4 45.2	6 15 5.1	6 44.8	1 54 35.7	44 17.7	9.489 7453	0.115 3790	0.113 9301
	6	69 21 21.1	6 17 52.6	+ 8 58.5	+2 38 16.4	+42 56.3	9.488 3542	0.112 3579	0.110 6620
	7	75 40 1.5	6 19 13.4	10 46.7	3 20 13.9	40 51.8	9.487 8588	0.108 8423	0.106 8092
	8	81 59 17.7	6 19 3.8	12 3.5	3 59 46.4	38 7.0	9.488 2703	0.104 8333	0.102 6454
	9	88 17 38.7	6 17 23.2	12 45.1	4 36 16.0	34 46.8	9.489 5794	0.100 3369	0.097 9092
	10	94 33 34.5	6 14 14.0	12 49.7	5 9 10.4	30 57.7	9.491 7572	0.095 3640	0.092 7033
	11	100 45 38.7	6 9 41.1	+12 18.3	+5 38 4.5	+26 47.5	9.494 7563	0.089 9293	0.087 0443
	12	106 52 31.4	6 3 52.4	11 13.6	6 2 41.1	22 24.2	9.498 5142	0.084 0509	0.080 9520
	13	112 53 1.6	5 56 57.7	9 40.5	6 22 51.0	17 55.4	9.502 9566	0.077 7507	0.074 4499
	14	118 46 8.5	5 49 7.8	7 44.7	6 38 32.3	13 28.1	9.508 0012	0.071 0526	0.067 5620
	15	124 31 2.5	5 40 34.1	5 32.8	6 49 49.8	9 8.7	9.513 5613	0.063 9815	0.060 3142
	16	130 7 5.8	5 31 28.2	+ 3 11.6	+6 56 54.0	+ 5 2.2	9.519 5488	0.056 5636	0.052 7329
	17	135 33 51.8	5 22 1.2	+ 0 47.3	+6 59 59.6	+ 1 12.0	9.525 8777	0.048 8253	0.044 8440

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
ay 16	130 7 5.8	5 31 28.2	+ 3 11.6	+6 56 54.0	+ 5 2.2	9.519 5488	0.056 5636	0.052 7329
17	135 33 51.8	5 22 1.2	+ 0 47.3	6 59 59.6	+ 1 12.0	9.525 8777	0.048 8253	0.044 8440
18	140 51 4.4	5 12 23.0	− 1 34.4	6 59 24.2	− 2 19.4	9.532 4660	0.040 7923	0.036 6733
19	145 58 37.0	5 2 42.5	3 48.8	6 55 27.5	5 30.6	9.539 2373	0.032 4901	0.028 2458
20	150 56 31.0	4 53 7.1	5 52.2	6 48 29.8	8 21.3	9.546 1218	0.023 9433	0.019 5855
21	155 44 54.9	4 43 43.0	− 7 41.7	+6 38 51.5	−10 51.8	9.553 0570	0.015 1753	0.010 7154
22	160 24 2.4	4 34 35.1	9 15.5	6 26 52.5	13 3.0	9.559 9875	0.006 2086	0.001 6574
23	164 54 11.6	4 25 47.0	10 32.4	6 12 51.4	14 56.1	9.566 8653	9.997 0644	9.992 4321
24	169 15 43.8	4 17 21.4	11 32.2	5 57 5.7	16 32.5	9.573 6490	9.987 7630	9.983 0595
25	173 29 2.5	4 9 20.2	12 14.9	5 39 51.4	17 53.6	9.580 3033	9.978 3239	9.973 5586
26	177 34 32.5	4 1 44.3	−12 41.2	+5 21 23.0	−19 1.1	9.586 7988	9.968 7658	9.963 9477
27	181 32 39.6	3 54 34.2	12 51.9	5 1 53.3	19 56.4	9.593 1109	9.959 1066	9.954 2447
28	185 23 49.5	3 47 49.9	12 48.2	4 41 33.8	20 40.9	9.599 2193	9.949 3642	9.944 4672
29	189 8 28.0	3 41 31.4	12 31.2	4 20 34.7	21 16.0	9.605 1077	9.939 5560	9.934 6329
30	192 47 0.7	3 35 38.0	12 2.4	3 59 4.7	21 42.8	9.610 7630	9.929 7001	9.924 7597
31	196 19 52.1	3 30 8.8	−11 23.1	+3 37 11.5	−22 2.4	9.616 1748	9.919 8140	9.914 8654
une 1	199 47 26.2	3 25 3.2	10 34.6	3 15 2.0	22 15.8	9.621 3351	9.909 9162	9.904 9689
2	203 10 6.1	3 20 20.2	9 38.3	2 52 41.8	22 23.8	9.626 2380	9.900 0260	9.895 0900
3	206 28 13.8	3 15 58.8	8 35.4	2 30 15.9	22 27.2	9.630 8789	9.890 1637	9.885 2497
4	209 42 10.6	3 11 58.1	7 27.1	2 7 48.7	22 26.6	9.635 2548	9.880 3509	9.875 4702
5	212 52 16.6	3 8 17.2	− 6 14.6	+1 45 23.9	−22 22.6	9.639 3637	9.870 6108	9.865 7758
6	215 58 51.3	3 4 55.2	4 59.0	1 23 4.6	22 15.5	9.643 2043	9.860 9684	9.856 1922
7	219 2 13.1	3 1 51.3	3 41.2	1 0 53.7	22 5.9	9.646 7762	9.851 4509	9.846 7482
8	222 2 39.6	2 59 4.6	2 22.2	0 38 53.5	21 54.1	9.650 0794	9.842 0879	9.837 4741
9	225 0 27.7	2 56 34.4	− 1 2.7	+0 17 6.2	21 40.3	9.653 1140	9.832 9112	9.828 4035
10	227 55 53.6	2 54 20.0	+ 0 16.3	−0 4 26.5	−21 24.8	9.655 8809	9.823 9554	9.819 5718
11	230 49 12.7	2 52 20.8	1 34.2	0 25 42.9	21 7.8	9.658 3811	9.815 2578	9.811 0183
12	233 40 40.0	2 50 36.3	2 50.4	0 46 41.7	20 49.4	9.660 6155	9.806 8587	9.802 7843
13	236 30 29.9	2 49 5.9	4 4.1	1 7 21.5	20 29.8	9.662 5850	9.798 8008	9.794 9139
14	239 18 56.3	2 47 49.2	5 14.9	1 27 41.1	20 9.1	9.664 2906	9.791 1295	9.787 4537
15	242 6 12.7	2 46 45.8	+ 6 22.1	−1 47 39.4	−19 47.3	9.665 7332	9.783 8926	9.780 4525
16	244 52 32.2	2 45 55.4	7 25.4	2 7 15.3	19 24.4	9.666 9138	9.777 1397	9.773 9607
17	247 38 7.7	2 45 17.8	8 24.2	2 26 27.9	19 0.5	9.667 8330	9.770 9218	9.768 0294
18	250 23 11.9	2 44 52.7	9 18.1	2 45 16.0	18 35.5	9.668 4914	9.765 2899	9.762 7096
19	253 7 57.2	2 44 39.9	10 6.7	3 3 38.6	18 9.4	9.668 8895	9.760 2948	9.758 0515
20	255 52 35.8	2 44 39.4	+10 49.7	−3 21 34.6	−17 42.3	9.669 0275	9.755 9859	9.754 1037
21	258 37 20.0	2 44 51.1	11 26.7	3 39 2.9	17 14.1	9.668 9057	9.752 4103	9.750 9110
22	261 22 22.0	2 45 15.0	11 57.5	3 56 2.3	16 44.5	9.668 5238	9.749 6106	9.748 5136
23	264 7 54.1	2 45 51.2	12 21.7	4 12 31.4	16 13.5	9.667 8815	9.747 6243	9.746 9464
24	266 54 8.5	2 46 39.7	12 39.0	4 28 28.8	15 41.1	9.666 9785	9.746 4831	9.746 2373
25	269 41 17.6	2 47 40.7	+12 49.3	−4 43 53.0	−15 7.0	9.665 8142	9.746 2111	9.746 4062
26	272 29 34.1	2 48 54.5	12 52.3	4 58 42.3	14 31.2	9.664 3878	9.746 8238	9.747 4644
27	275 19 10.8	2 50 21.1	12 47.8	5 12 54.7	13 53.4	9.662 6986	9.748 3279	9.749 4138
28	278 10 20.7	2 52 1.0	12 35.7	5 26 28.2	13 13.4	9.660 7455	9.750 7208	9.752 2471
29	281 3 17.3	2 53 54.6	12 15.9	5 39 20.6	12 31.0	9.658 5275	9.753 9905	9.755 9482
30	283 58 14.5	2 56 2.1	+11 48.4	−5 51 29.3	−11 46.0	9.656 0438	9.758 1167	9.760 4921
July 1	286 55 26.4	2 58 24.1	+11 13.0	−6 2 51.6	−10 58.1	9.653 2935	9.763 0703	9.765 8464

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth— At Date.	At Intermediate Date
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 1	286 55 26.4	2 58 24.1	+11 13.0	−6 2 51.6	−10 58.1	9.653 2935	9.763 0703	9.765 84
2	289 55 7.7	3 1 1.1	10 29.9	6 13 24.4	10 7.0	9.650 2756	9.768 8154	9.771 97
3	292 57 33.8	3 3 53.6	9 39.1	6 23 4.4	9 12.4	9.646 9892	9.775 3104	9.778 824
4	296 3 0.3	3 7 2.1	8 40.9	6 31 47.9	8 13.9	9.643 4341	9.782 5081	9.786 354
5	299 11 43.6	3 10 27.4	7 35.5	6 39 30.7	7 11.0	9.639 6102	9.790 3577	9.794 510
6	302 24 0.9	3 14 10.1	+ 6 23.3	−6 46 8.4	− 6 3.5	9.635 5179	9.798 8061	9.803 237
7	305 40 9.9	3 18 10.9	5 4.7	6 51 36.1	4 50.9	9.631 1585	9.807 7987	9.812 48
8	309 0 29.0	3 22 30.4	3 40.4	6 55 48.5	3 32.8	9.626 5339	9.817 2806	9.822 187
9	312 25 17.3	3 27 9.4	2 11.2	6 58 39.8	2 8.7	9.621 6473	9.827 1971	9.832 30
10	315 54 54.6	3 32 8.7	+ 0 38.0	7 0 3.8	− 0 38.0	9.616 5028	9.837 4948	9.842 770
11	319 29 41.6	3 37 28.9	− 0 58.1	−6 59 53.6	+ 0 59.7	9.611 1063	9.848 1212	9.853 541
12	323 9 59.5	3 43 10.5	2 35.7	6 58 2.0	2 44.8	9.605 4658	9.859 0261	9.864 567
13	326 56 9.9	3 49 14.0	4 13.2	6 54 21.3	4 37.8	9.599 5915	9.870 1612	9.875 800
14	330 48 35.0	3 55 40.0	5 49.0	6 48 43.5	6 39.2	9.593 4963	9.881 4801	9.887 194
15	334 47 37.4	4 2 28.6	7 20.8	6 41 0.1	8 49.1	9.587 1963	9.892 9385	9.898 706
16	338 53 39.6	4 9 39.5	− 8 46.5	−6 31 2.5	+11 7.6	9.580 7115	9.904 4940	9.910 295
17	343 7 3.8	4 17 12.5	10 3.6	6 18 42.0	13 34.7	9.574 0661	9.916 1057	9.921 9
18	347 28 11.7	4 25 6.8	11 9.5	6 3 50.2	16 10.2	9.567 2895	9.927 7341	9.933 542
19	351 57 24.1	4 33 21.0	12 1.3	5 46 19.1	18 53.2	9.560 4164	9.939 3411	9.945 124
20	356 34 59.8	4 41 53.2	12 36.3	5 26 1.6	21 42.8	9.553 4877	9.950 8892	9.956 620
21	1 21 15.5	4 50 40.7	−12 51.8	−5 2 51.9	+24 37.4	9.546 5512	9.962 3414	9.968 02
22	6 16 24.8	4 59 39.8	12 45.4	4 36 46.0	27 34.7	9.539 6618	9.973 6613	9.979 260
23	11 20 37.3	5 8 46.0	12 15.2	4 7 42.6	30 31.9	9.532 8815	9.984 8124	9.990 313
24	16 33 57.4	5 17 53.8	11 20.1	3 35 43.5	33 25.4	9.526 2797	9.995 7586	0.001 143
25	21 56 23.4	5 26 56.7	9 59.7	3 0 54.4	36 10.9	9.519 9323	0.006 4639	0.011 714
26	27 27 46.5	5 35 46.6	− 8 15.1	−2 23 25.9	+38 43.4	9.513 9211	0.016 8920	0.021 991
27	33 7 49.4	5 44 14.7	6 8.5	1 43 33.7	40 57.4	9.508 3319	0.027 0074	0.031 936
28	38 56 5.4	5 52 11.2	3 43.9	1 1 39.1	42 47.0	9.503 2526	0.036 7753	0.041 518
29	44 51 57.7	5 59 25.6	− 1 6.6	−0·18 9.5	44 6.5	9.498 7702	0.046 1623	0.050 703
30	50 54 38.9	6 5 47.2	+ 1 36.6	+0 26 22.2	44 50.5	9.494 9675	0.055 1367	0.059 459
31	57 3 11.0	6 11 5.7	+ 4 18.0	+1 11 18.3	+44 54.6	9.491 9193	0.063 6693	0.067 761
Aug. 1	63 16 26.0	6 15 11.5	6 49.2	1 55 57.3	44 15.9	9.489 6888	0.071 7348	0.075 585
2	69 33 7.1	6 17 56.5	9 2.2	2 39 35.5	42 53.1	9.488 3245	0.079 3115	0.082 9111
3	75 51 50.1	6 19 14.6	10 49.5	3 21 29.2	40 47.2	9.487 8568	0.086 3826	0.089 724
4	82 11 6.1	6 19 2.2	12 5.3	4 0 56.6	38 1.2	9.488 2960	0.092 9362	0.096 0167
5	88 29 24.1	6 17 18.8	+12 45.8	+4 37 19.9	+34 40.1	9.489 6322	0.098 9659	0.101 783
6	94 45 14.2	6 14 6.8	12 49.3	5 10 7.3	30 50.4	9.491 8358	0.104 4707	0.107 027
7	100 57 10.1	6 9 31.6	12 16.8	5 38 53.8	26 39.7	9.494 8592	0.109 4550	0.111 754
8	107 3 52.3	6 3 40.8	11 11.2	6 3 22.4	22 16.0	9.498 6393	0.113 9277	0.115 976
9	113 4 9.8	5 56 44.2	9 37.2	6 23 24.0	17 47.1	9.503 1016	0.117 9021	0.119 7074
10	118 57 2.3	5 48 52.7	+ 7 40.8	+6 38 57.1	+13 20.0	9.508 1634	0.121 3946	0.122 9663
11	124 41 40.8	5 40 17.9	5 28.6	6 50 6.6	9 0.9	9.513 7378	0.124 4250	0.125 7735
12	130 17 27.5	5 31 11.2	3 7.2	6 57 3.2	4 54.8	9.519 7370	0.127 0146	0.128 1511
13	135 43 56.2	5 21 43.7	+ 0 42.9	7 0 1.7	+ 1 5.2	9.526 0750	0.129 1859	0.130 1219
14	141 0 51.2	5 12 5.3	− 1 38.7	6 59 19.9	− 2 25.6	9.532 6700	0.130 9621	0.131 7093
15	146 8 6.0	5 2 24.8	− 3 52.8	+6 55 17.3	− 5 36.2	9.539 4460	0.132 3665	0.132 9365
16	151 5 42.4	4 52 49.6	− 5 55.8	+6 48 14.3	− 8 26.3	9.546 3330	0.133 4221	0.133 8250

MERCURY.

GREENWICH MEAN NOON.

ate.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
g. 16	151 5 42.4	4 52 49.6	− 5 55.8	+6 48 14.3	− 8 26.3	9.546 3330	0.133 4221	0.133 8259
17	155 53 49.1	4 43 26.0	7 44.8	6 38 31.4	10 56.2	9.553 2689	0.134 1506	0.134 3987
18	160 32 39.9	4 34 18.7	9 18.1	6 26 28.3	13 6.9	9.560 1986	0.134 5728	0.134 6754
19	165 2 33.0	4 25 31.2	10 34.5	6 12 23.7	14 59.4	9.567 0742	0.134 7087	0.134 6751
20	169 23 49.7	4 17 6.3	11 33.8	5 56 35.1	16 35.2	9.573 8545	0.134 5766	0.134 4152
21	173 36 53.7	4 9 5.8	−12 16.0	+5 39 18.3	−17 55.9	9.580 5045	0.134 1929	0.133 9118
22	177 42 9.8	4 1 30.6	12 41.8	5 20 47.8	19 3.0	9.586 9949	0.133 5736	0.133 1799
23	181 40 3.6	3 54 21.4	12 52.0	5 1 16.4	19 58.0	9.593 3010	0.132 7323	0.132 2325
24	185 31 1.2	3 47 38.0	12 47.9	4 40 55.5	20 42.1	9.599 4029	0.131 6817	0.131 0814
25	189 15 28.2	3 41 20.2	12 30.5	4 19 55.3	21 16.8	9.605 2844	0.130 4329	0.129 7374
26	192 53 50.0	3 35 27.5	−12 1.3	+3 58 24.5	−21 43.4	9.610 9324	0.128 9960	0.128 2097
27	196 26 31.3	3 29 59.2	11 21.7	3 36 30.7	22 2.9	9.616 3366	0.127 3795	0.126 5064
28	199 53 56.1	3 24 54.3	10 32.9	3 14 20.8	22 16.1	9.621 4893	0.125 5911	0.124 6345
29	203 16 27.3	3 20 11.9	9 36.4	2 52 0.3	22 24.0	9.626 3843	0.123 6373	0.122 6002
30	206 34 27.0	3 15 51.1	8 33.3	2 29 34.3	22 27.3	9.631 0172	0.121 5236	0.120 4083
31	209 48 16.4	3 11 51.0	− 7 24.9	+2 7 7.1	−22 26.5	9.635 3850	0.119 2546	0.118 0631
pt. 1	212 58 15.6	3 8 10.7	6 12.3	1 44 42.4	22 22.3	9.639 4856	0.116 8340	0.115 5678
2	216 4 44.1	3 4 49.3	4 56.6	1 22 23.4	22 15.2	9.643 3179	0.114 2647	0.112 9250
3	219 8 0.2	3 1 45.9	3 38.8	1 0 12.8	22 5.6	9.646 8815	0.111 5489	0.110 1366
4	222 8 21.6	2 58 59.7	2 19.7	0 38 13.0	21 53.7	9.650 1764	0.108 6882	0.107 2039
5	225 6 5.1	2 56 30.0	− 1 0.3	+0 16 26.0	−21 39.9	9.653 2028	0.105 6836	0.104 1273
6	228 1 26.8	2 54 16.1	+ 0 18.7	−0 5 6.2	21 24.3	9.655 9617	0.102 5350	0.100 9067
7	230 54 42.3	2 52 17.4	1 36.6	0 26 22.1	21 7.2	9.658 4538	0.099 2422	0.097 5414
8	233 46 6.4	2 50 33.3	2 52.7	0 47 20.3	20 48.8	9.660 6799	0.095 8042	0.094 0304
9	236 35 53.5	2 49 3.3	4 6.4	1 7 59.4	20 29.2	9.662 6413	0.092 2197	0.090 3719
10	239 24 17.5	2 47 47.0	+ 5 17.0	−1 28 18.3	−20 8.5	9.664 3388	0.088 4867	0.086 5638
11	242 11 31.9	2 46 44.0	6 24.1	1 48 16.0	19 46.7	9.665 7733	0.084 6029	0.082 6036
12	244 57 49.9	2 45 54.1	7 27.2	2 7 51.3	19 23.7	9.666 9458	0.080 5656	0.078 4884
13	247 43 24.3	2 45 16.8	8 25.9	2 27 3.1	18 59.7	9.667 8570	0.076 3715	0.074 2146
14	250 28 27.7	2 44 52.0	9 19.6	2 45 50.4	18 34.7	9.668 5075	0.072 0171	0.069 7786
15	253 13 12.5	2 44 39.7	+10 8.1	−3 4 12.2	−18 8.7	9.668 8975	0.067 4985	0.065 1763
16	255 57 51.1	2 44 39.6	10 50.9	3 22 7.4	17 41.6	9.669 0275	0.062 8115	0.060 4034
17	258 42 35.7	2 44 51.6	11 27.8	3 39 34.9	17 13.2	9.668 8976	0.057 9515	0.055 4551
18	261 27 38.4	2 45 15.9	11 58.3	3 56 33.4	16 43.5	9.668 5075	0.052 9136	0.050 3264
19	264 13 11.6	2 45 52.5	12 22.3	4 13 1.5	16 12.5	9.667 8571	0.047 6928	0.045 0121
20	266 59 27.5	2 46 41.4	+12 39.4	−4 28 57.9	−15 40.0	9.666 9461	0.042 2837	0.039 5068
21	269 46 38.5	2 47 42.8	12 49.5	4 44 21.0	15 5.9	9.665 7736	0.036 6808	0.033 8049
22	272 34 57.3	2 48 57.0	12 52.2	4 59 9.1	14 30.0	9.664 3389	0.030 8784	0.027 9006
23	275 24 36.7	2 50 24.0	12 47.5	5 13 20.4	13 52.2	9.662 6415	0.024 8708	0.021 7883
24	278 15 49.7	2 52 4.3	12 35.2	5 26 52.7	13 12.1	9.660 6803	0.018 6524	0.015 4625
25	281 8 49.8	2 53 58.3	+12 15.2	−5 39 43.8	−12 29.6	9.658 4542	0.012 2178	0.008 9177
26	284 3 50.9	2 56 6.3	11 47.3	5 51 51.1	11 44.5	9.655 9622	0.005 5617	0.002 1491
27	287 1 7.3	2 58 28.8	11 11.8	6 3 11.9	10 56.6	9.653 2034	9.998 6794	9.995 1522
28	290 0 53.5	3 1 6.2	10 28.4	6 13 43.2	10 5.4	9.650 1770	9.991 5671	9.987 9236
29	293 3 24.9	3 3 59.2	9 37.4	6 23 21.5	9 10.6	9.646 8822	9.984 2217	9.980 4613
30	296 8 57.3	3 7 8.2	+ 8 39.0	−6 32 3.1	− 8 11.9	9.643 3186	9.976 6423	9.972 7647
Oct. 1	299 17 47.0	3 10 34.0	+ 7 33.4	−6 39 44.0	− 7 9.0	9.639 4862	9.968 8289	9.964 8354

SATURN, 1915.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	6 58 39.79	+1.005	+22 10 16.0	−1.32	20 17.4
2	6 59 3.75	0.992	22 9 44.6	1.31	20 13.9
3	6 59 27.40	0.979	22 9 13.3	1.30	20 10.3
4	6 59 50.75	0.966	22 8 42.2	1.29	20 6.8
5	7 0 13.78	0.953	22 8 11.3	1.28	20 3.2
6	7 0 36.50	+0.940	+22 7 40.6	−1.27	19 59.6
7	7 0 58.89	0.926	22 7 10.1	1.26	19 56.1
8	7 1 20.95	0.912	22 6 40.0	1.25	19 52.5
9	7 1 42.68	0.898	22 6 10.1	1.24	19 48.9
10	7 2 4.07	0.884	22 5 40.5	1.23	19 45.4
11	7 2 25.12	+0.870	+22 5 11.2	−1.21	19 41.8
12	7 2 45.82	0.855	22 4 42.2	1.20	19 38.2
13	7 3 6.17	0.840	22 4 13.6	1.19	19 34.6
14	7 3 26.17	0.826	22 3 45.3	1.17	19 31.0
15	7 3 45.80	0.811	22 3 17.4	1.15	19 27.4
16	7 4 5.07	+0.795	+22 2 50.0	−1.14	19 23.7
17	7 4 23.98	0.780	22 2 22.9	1.12	19 20.1
18	7 4 42.51	0.764	22 1 56.2	1.10	19 16.5
19	7 5 0.67	0.749	22 1 30.0	1.08	19 12.9
20	7 5 18.44	0.733	22 1 4.2	1.06	19 9.2
21	7 5 35.84	+0.717	+22 0 38.9	−1.04	19 5.6
22	7 5 52.85	0.701	22 0 14.1	1.02	19 1.9
23	7 6 9.47	0.684	21 59 49.8	1.00	18 58.2
24	7 6 25.70	0.668	21 59 26.0	0.98	18 54.6
25	7 6 41.54	0.651	21 59 2.6	0.96	18 50.9
26	7 6 56.97	+0.635	+21 58 39.8	−0.94	18 47.2
27	7 7 12.00	0.618	21 58 17.6	0.91	18 43.5
28	7 7 26.62	0.601	21 57 55.9	0.89	18 39.8
29	7 7 40.82	0.583	21 57 34.8	0.87	18 36.1
30	7 7 54.61	0.566	21 57 14.3	0.84	18 32.4
31	7 8 7.98	+0.548	+21 56 54.4	−0.82	18 28.7
32	7 8 20.93	+0.530	+21 56 35.2	−0.79	18 25.0

Day of the Month.	6th.	14th.	22d.	30th.
	″	″	″	″
Semidiameter . . .	8.16	8.26	8.37	8.49
Horizontal Parallax	0.93	0.94	0.95	0.96

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	7 8 7.98	+0.548	+21 56 54.4	−0.82	18 28.[illegible]
2	7 8 20.93	0.530	21 56 35.2	0.79	18 25.[illegible]
3	7 8 33.44	0.512	21 56 16.5	0.76	18 21.[illegible]
4	7 8 45.52	0.494	21 55 58.5	0.74	18 17.[illegible]
5	7 8 57.17	0.476	21 55 41.2	0.71	18 13.[illegible]
6	7 9 8.38	+0.458	+21 55 24.5	−0.68	18 10.[illegible]
7	7 9 19.14	0.439	21 55 8.6	0.65	18 6.[illegible]
8	7 9 29.45	0.420	21 54 53.3	0.62	18 2.[illegible]
9	7 9 39.32	0.402	21 54 38.8	0.59	17 58.[illegible]
10	7 9 48.73	0.383	21 54 25.0	0.56	17 54.[illegible]
11	7 9 57.68	+0.364	+21 54 11.9	−0.53	17 51.[illegible]
12	7 10 6.18	0.345	21 53 59.6	0.50	17 47.[illegible]
13	7 10 14.22	0.325	21 53 48.0	0.47	17 43.[illegible]
14	7 10 21.80	0.306	21 53 37.2	0.43	17 39.[illegible]
15	7 10 28.91	0.287	21 53 27.2	0.40	17 35.[illegible]
16	7 10 35.55	+0.267	+21 53 18.0	−0.37	17 32.[illegible]
17	7 10 41.73	0.248	21 53 9.5	0.34	17 28.[illegible]
18	7 10 47.44	0.228	21 53 1.9	0.30	17 24.[illegible]
19	7 10 52.68	0.209	21 52 55.0	0.27	17 20.[illegible]
20	7 10 57.45	0.189	21 52 49.0	0.23	17 16.7
21	7 11 1.75	+0.169	+21 52 43.7	−0.20	17 12.[illegible]
22	7 11 5.58	0.150	21 52 39.3	0.17	17 9.0
23	7 11 8.93	0.130	21 52 35.7	0.13	17 5.1
24	7 11 11.80	0.110	21 52 33.0	0.10	17 1.2
25	7 11 14.20	0.090	21 52 31.0	0.06	16 57.3
26	7 11 16.12	+0.070	+21 52 29.9	−0.03	16 53.4
27	7 11 17.56	0.050	21 52 29.7	+0.01	16 49.5
28	7 11 18.52	0.030	21 52 30.3	0.04	16 45.6
29	7 11 18.99	+0.010	21 52 31.7	0.08	16 41.6
30	7 11 18.99	−0.010	21 52 34.0	0.11	16 37.7
31	7 11 18.50	−0.030	+21 52 37.2	+0.15	16 33.8
32	7 11 17.53	−0.050	+21 52 41.2	+0.18	16 29.8

Day of the Month.	8th.	16th.	24th.
	″	″	″
Semidiameter	8.61	8.74	8.87
Horizontal Parallax . . .	0.98	0.99	1.01

NOTE.—The sign + indicates north declinations.

SATURN, 1915.

GREENWICH MEAN TIME.

NOVEMBER.					DECEMBER.					
Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.	Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
7 11 17.53	−0.050	+21 52 41.2	+0.18	16 29.8	1	7 7 13.66	−0.603	+22 0 58.2	+1.14	14 27.7
7 11 16.08	0.071	21 52 46.0	0.22	16 25.8	2	7 6 59.01	0.618	22 1 25.8	1.16	14 23.5
7 11 14.15	0.091	21 52 51.8	0.26	16 21.9	3	7 6 43.99	0.633	22 1 53.9	1.18	14 19.3
7 11 11.73	0.111	21 52 58.3	0.29	16 17.9	4	7 6 28.62	0.648	22 2 22.6	1.21	14 15.1
7 11 8.83	0.131	21 53 5.8	0.33	16 13.9	5	7 6 12.90	0.662	22 2 51.8	1.23	14 10.9
7 11 5.45	−0.151	+21 53 14.1	+0.36	16 9.9	6	7 5 56.84	−0.676	+22 3 21.5	+1.25	14 6.7
7 11 1.59	0.171	21 53 23.2	0.40	16 5.9	7	7 5 40.46	0.690	22 3 51.7	1.27	14 2.5
7 10 57.25	0.191	21 53 33.2	0.43	16 1.9	8	7 5 23.75	0.703	22 4 22.3	1.29	13 58.3
7 10 52.44	0.210	21 53 44.1	0.47	15 57.9	9	7 5 6.74	0.715	22 4 53.5	1.31	13 54.1
7 10 47.16	0.230	21 53 55.8	0.50	15 53.9	10	7 4 49.42	0.728	22 5 25.0	1.32	13 49.9
7 10 41.40	−0.249	+21 54 8.3	+0.54	15 49.8	11	7 4 31.82	−0.739	+22 5 56.9	+1.34	13 45.6
7 10 35.18	0.269	21 54 21.6	0.57	15 45.8	12	7 4 13.94	0.751	22 6 29.2	1.35	13 41.4
7 10 28.50	0.288	21 54 35.8	0.61	15 41.7	13	7 3 55.78	0.762	22 7 1.9	1.37	13 37.2
7 10 21.36	0.307	21 54 50.8	0.64	15 37.7	14	7 3 37.37	0.772	22 7 34.9	1.38	13 32.9
7 10 13.76	0.326	21 55 6.6	0.67	15 33.6	15	7 3 18.71	0.783	22 8 8.3	1.40	13 28.7
7 10 5.70	−0.345	+21 55 23.1	+0.71	15 29.6	16	7 2 59.81	−0.792	+22 8 41.9	+1.41	13 24.4
7 9 57.20	0.363	21 55 40.5	0.74	15 25.5	17	7 2 40.68	0.802	22 9 15.8	1.42	13 20.2
7 9 48.26	0.382	21 55 58.6	0.77	15 21.4	18	7 2 21.34	0.810	22 9 49.9	1.43	13 15.9
7 9 38.88	0.400	21 56 17.4	0.80	15 17.3	19	7 2 1.79	0.819	22 10 24.3	1.44	13 11.7
7 9 29.06	0.418	21 56 37.0	0.83	15 13.2	20	7 1 42.04	0.827	22 10 58.9	1.45	13 7.4
7 9 18.81	−0.436	+21 56 57.4	+0.86	15 9.1	21	7 1 22.11	−0.834	+22 11 33.7	+1.45	13 3.1
7 9 8.13	0.454	21 57 18.4	0.89	15 5.0	22	7 1 2.00	0.841	22 12 8.6	1.46	12 58.9
7 8 57.03	0.471	21 57 40.2	0.92	15 0.9	23	7 0 41.73	0.848	22 12 43.7	1.47	12 54.6
7 8 45.51	0.489	21 58 2.6	0.95	14 56.7	24	7 0 21.31	0.854	22 13 19.0	1.47	12 50.3
7 8 33.58	0.506	21 58 25.8	0.98	14 52.6	25	7 0 0.75	0.860	22 13 54.3	1.47	12 46.1
7 8 21.25	−0.522	+21 58 49.6	+1.01	14 48.5	26	6 59 40.05	−0.865	+22 14 29.8	+1.48	12 41.8
7 8 8.51	0.539	21 59 14.0	1.03	14 44.3	27	6 59 19.24	0.869	22 15 5.3	1.48	12 37.5
7 7 55.37	0.555	21 59 39.2	1.06	14 40.2	28	6 58 58.32	0.874	22 15 40.8	1.48	12 33.2
7 7 41.85	0.572	22 0 4.9	1.09	14 36.0	29	6 58 37.31	0.877	22 16 16.5	1.48	12 28.9
7 7 27.94	0.587	22 0 31.3	1.11	14 31.8	30	6 58 16.21	0.881	22 16 52.1	1.48	12 24.7
7 7 13.66	−0.603	+22 0 58.2	+1.14	14 27.7	31	6 57 55.05	−0.883	+22 17 27.7	+1.48	12 20.4
7 6 59.00	−0.618	+22 1 25.8	+1.16	14 23.5	32	6 57 33.82	−0.885	+22 18 3.3	+1.48	12 16.1

Day of the Month.	1st.	9th.	17th.	25th.	Day of Month.	3d.	11th.	19th.	27th.	35th.
	″	″	″	″		″	″	″	″	″
Semidiameter . . .	9.00	9.12	9.24	9.35	Semidiam.	9.45	9.53	9.59	9.62	9.64
Horizontal Parallax	1.02	1.04	1.05	1.06	Hor. Par. .	1.07	1.08	1.09	1.09	1.09

Note.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasin
sign – indicates that north declinations are decreasing.

URANUS, 1915.

GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.	Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h
Jan. 0	20 49 49.31	+12.659	−18 23 56.8	+50.97	2 13.2	July 3	21 10 35.83	− 7.262	−17 1 11.4	−33.66	14 26.
4	20 50 40.67	13.010	18 20 29.8	52.48	1 58.3	7	21 10 5.80	7.744	17 3 30.0	35.57	14 10.
8	20 51 33.33	13.315	18 16 57.1	53.86	1 43.5	11	21 9 33.94	8.177	17 5 55.7	37.26	13 54
12	20 52 27.13	13.577	18 13 19.3	55.06	1 28.6	15	21 9 0.45	8.557	17 8 27.7	38.68	13 37
16	20 53 21.89	13.791	18 9 37.0	56.06	1 13.8	19	21 8 25.56	8.879	17 11 4.8	39.82	13 21.
20	20 54 17.40	+13.951	−18 5 51.1	+56.86	0 59.0	23	21 7 49.50	− 9.142	−17 13 45.9	−40.69	13 5
24	20 55 13.44	14.059	18 2 2.4	57.46	0 44.2	27	21 7 12.51	9.346	17 16 30.0	41.30	12 48
28	20 56 9.81	14.120	17 58 11.6	57.87	0 29.4	31	21 6 34.81	9.494	17 19 16.0	41.65	12 32
Feb. 1	20 57 6.34	14.137	17 54 19.6	58.11	0 14.6	Aug. 4	21 5 56.64	9.582	17 22 2.9	41.76	12 16.
5	20 58 2.85	14.110	17 50 27.1	58.15	23 56.1	8	21 5 18.24	9.606	17 24 49.7	41.57	11 59
9	20 58 59.16	+14.037	−17 46 34.8	+57.98	23 41.4	12	21 4 39.88	− 9.563	−17 27 35.1	−41.09	11 43
13	20 59 55.08	13.912	17 42 43.5	57.62	23 26.5	16	21 4 1.82	9.456	17 30 18.0	40.33	11 26
17	21 0 50.39	13.738	17 38 54.0	57.05	23 11.7	20	21 3 24.32	9.284	17 32 57.4	39.29	11 10.
21	21 1 44.92	13.515	17 35 7.4	56.27	22 56.9	24	21 2 47.63	9.051	17 35 32.0	38.02	10 54
25	21 2 38.46	13.249	17 31 24.2	55.28	22 42.0	28	21 2 11.99	8.761	17 38 1.2	36.53	10 37
Mar. 1	21 3 30.86	+12.944	−17 27 45.4	+54.08	22 27.1	Sept. 1	21 1 37.62	− 8.415	−17 40 24.0	−34.81	10 21.
5	21 4 21.96	12.601	17 24 11.7	52.73	22 12.3	5	21 1 4.75	8.011	17 42 39.4	32.86	10 5
9	21 5 11.61	12.216	17 20 43.8	51.18	21 57.4	9	21 0 33.61	7.549	17 44 46.6	30.70	9 40
13	21 5 59.63	11.787	17 17 22.5	49.43	21 42.5	13	21 0 4.43	7.032	17 46 44.7	28.32	9 32
17	21 6 45.85	11.316	17 14 8.6	47.48	21 27.5	17	20 59 37.42	6.466	17 48 32.9	25.75	9 16.
21	21 7 30.11	+10.807	−17 11 2.9	+45.34	21 12.5	21	20 59 12.76	− 5.858	−17 50 10.5	−23.05	9 0
25	21 8 12.26	10.263	17 8 6.1	43.04	20 57.5	25	20 58 50.61	5.213	17 51 37.1	20.22	8 44
29	21 8 52.17	9.690	17 5 18.8	40.58	20 42.4	29	20 58 31.10	4.532	17 52 52.1	17.26	8 28
Apr. 2	21 9 29.73	9.090	17 2 41.6	37.97	20 27.3	Oct. 3	20 58 14.39	3.816	17 53 55.0	14.18	8 12.
6	21 10 4.84	8.460	17 0 15.2	35.22	20 12.1	7	20 58 0.61	3.068	17 54 45.4	10.99	7 56.
10	21 10 37.37	+ 7.797	−16 58 0.0	+32.34	19 56.9	11	20 57 49.88	− 2.295	−17 55 22.8	− 7.70	7 40
14	21 11 7.18	7.105	16 55 56.7	29.30	19 41.7	15	20 57 42.28	1.501	17 55 46.9	4.36	7 24
18	21 11 34.18	6.392	16 54 5.8	26.14	19 26.4	19	20 57 37.89	− 0.693	17 55 57.6	− 0.98	7 8.
22	21 11 58.29	5.661	16 52 27.7	22.90	19 11.1	23	20 57 36.74	+ 0.122	17 55 54.7	+ 2.42	6 53
26	21 12 19.45	4.916	16 51 2.7	19.57	18 55.7	27	20 57 38.87	0.942	17 55 38.2	5.83	6 37
30	21 12 37.60	+ 4.158	−16 49 51.2	+16.18	18 40.2	31	20 57 44.28	+ 1.765	−17 55 8.0	+ 9.26	6 21.
May 4	21 12 52.70	3.388	16 48 53.3	12.74	18 24.7	Nov. 4	20 57 52.99	2.590	17 54 24.1	12.68	6 6.
8	21 13 4.69	2.608	16 48 9.3	9.25	18 9.2	8	20 58 5.00	3.413	17 53 26.6	16.08	5 50
12	21 13 13.55	1.820	16 47 39.3	5.73	17 53.6	12	20 58 20.28	4.224	17 52 15.5	19.46	5 35
16	21 13 19.24	1.028	16 47 23.5	+ 2.19	17 38.0	16	20 58 38.77	5.018	17 50 51.0	22.77	5 19
20	21 13 21.77	+ 0.238	−16 47 21.8	− 1.33	17 22.3	20	20 59 0.40	+ 5.792	−17 49 13.5	+25.98	5 4
24	21 13 21.15	− 0.545	16 47 34.1	4.81	17 6.5	24	20 59 25.08	6.543	17 47 23.4	29.11	4 40
28	21 13 17.42	1.316	16 48 0.2	8.22	16 50.7	28	20 59 52.72	7.274	17 45 20.9	32.16	4 33
June 1	21 13 10.64	2.072	16 48 39.7	11.56	16 34.9	Dec. 2	21 0 23.24	7.983	17 43 6.2	35.14	4 18.
5	21 13 0.86	2.818	16 49 32.5	14.83	16 19.0	6	21 0 56.54	8.662	17 40 39.8	38.02	4 3
9	21 12 48.12	− 3.548	−16 50 38.3	−18.01	16 3.0	10	21 1 32.48	+ 9.305	−17 38 2.2	+40.77	3 48.
13	21 12 32.51	4.251	16 51 56.5	21.05	15 47.0	14	21 2 10.93	9.912	17 35 13.8	43.38	3 33
17	21 12 14.15	4.925	16 53 26.5	23.94	15 31.0	18	21 2 51.73	10.478	17 32 15.3	45.84	3 18.
21	21 11 53.16	5.566	16 55 7.8	26.66	15 14.9	22	21 3 34.71	11.005	17 29 7.3	48.14	3 3
25	21 11 29.67	6.172	16 56 59.5	29.18	14 58.8	26	21 4 19.72	11.495	17 25 50.4	50.30	2 48.
29	21 11 3.84	− 6.737	−16 59 1.0	−31.52	14 42.6	30	21 5 6.62	+11.948	−17 22 25.2	+52.32	2 33
July 3	21 10 35.83	− 7.262	−17 1 11.4	−33.66	14 26.4	34	21 5 55.25	+12.356	−17 18 52.1	+54.18	2 18.

Least semidiameter,	February 2,	1″.61	Least horizontal parallax,	February 2,	0″.4
Greatest semidiameter,	August 6,	1″.77	Greatest horizontal parallax,	August 6,	0″.4

GREENWICH MEAN TIME.

onth and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
n. 0	8 6 45.63	−6.477	+19 52 26.8	+19.94	13 28.2	July 3	8 6 0.83	+8.861	+19 58 5.2	−25.70	1 24.1
4	8 6 19.29	6.682	19 53 47.8	20.55	13 12.0	7	8 6 36.57	9.005	19 56 21.2	26.30	1 8.9
8	8 5 52.22	6.846	19 55 10.9	21.02	12 55.9	11	8 7 12.83	9.118	19 54 35.0	26.81	0 53.8
12	8 5 24.58	6.965	19 56 35.7	21.36	12 39.7	15	8 7 49.47	9.197	19 52 46.9	27.22	0 38.7
16	8 4 56.57	7.034	19 58 1.6	21.56	12 23.5	19	8 8 26.37	9.246	19 50 57.4	27.53	0 23.6
20	8 4 28.38	−7.055	+19 59 28.0	+21.61	12 7.3	23	8 9 3.39	+9.261	+19 49 6.8	−27.75	0 8.5
24	8 4 0.19	7.030	20 0 54.3	21.51	11 51.1	27	8 9 40.41	9.246	19 47 15.6	27.88	23 49.6
28	8 3 32.20	6.960	20 2 19.9	21.29	11 34.9	31	8 10 17.32	9.203	19 45 24.0	27.91	23 34.5
eb. 1	8 3 4.57	6.845	20 3 44.4	20.94	11 18.7	Aug. 4	8 10 53.99	9.130	19 43 32.4	27.86	23 19.4
5	8 2 37.50	6.687	20 5 7.3	20.47	11 2.6	8	8 11 30.31	9.024	19 41 41.3	27.71	23 4.2
9	8 2 11.13	−6.487	+20 6 28.0	+19.86	10 46.4	12	8 12 6.14	+8.886	+19 39 51.0	−27.43	22 49.1
13	8 1 45.65	6.243	20 7 46.0	19.14	10 30.2	16	8 12 41.36	8.715	19 38 2.0	27.06	22 33.9
17	8 1 21.24	5.957	20 9 0.9	18.31	10 14.1	20	8 13 15.83	8.514	19 36 14.7	26.57	22 18.8
21	8 0 58.05	5.631	20 10 12.2	17.36	9 58.0	24	8 13 49.44	8.285	19 34 29.6	25.97	22 3.6
25	8 0 36.24	5.271	20 11 19.6	16.32	9 41.9	28	8 14 22.07	8.029	19 32 47.0	25.29	21 48.4
ar. 1	8 0 15.93	−4.880	+20 12 22.7	+15.19	9 25.9	Sept. 1	8 14 53.64	+7.747	+19 31 7.4	−24.53	21 33.2
5	7 59 57.24	4.460	20 13 21.0	13.98	9 9.8	5	8 15 24.01	7.434	19 29 31.0	23.66	21 18.0
9	7 59 40.29	4.013	20 14 14.4	12.72	8 53.8	9	8 15 53.07	7.092	19 27 58.3	22.67	21 2.7
13	7 59 25.17	3.540	20 15 2.6	11.38	8 37.8	13	8 16 20.70	6.721	19 26 29.8	21.58	20 47.4
17	7 59 12.00	3.041	20 15 45.3	9.96	8 21.9	17	8 16 46.81	6.326	19 25 5.8	20.38	20 32.1
21	7 59 0.86	−2.524	+20 16 22.3	+ 8.50	8 6.0	21	8 17 11.29	+5.909	+19 23 46.8	−19.10	20 16.8
25	7 58 51.82	1.994	20 16 53.3	7.01	7 50.1	25	8 17 34.06	5.473	19 22 33.1	17.77	20 1.5
29	7 58 44.93	1.453	20 17 18.3	5.49	7 34.3	29	8 17 55.05	5.016	19 21 24.8	16.35	19 46.1
pr. 2	7 58 40.21	0.905	20 17 37.2	3.94	7 18.5	Oct. 3	8 18 14.16	4.536	19 20 22.5	14.84	19 30.6
6	7 58 37.70	−0.350	20 17 49.8	2.37	7 2.7	7	8 18 31.31	4.037	19 19 26.3	13.23	19 15.2
10	7 58 37.42	+0.211	+20 17 56.1	+ 0.79	6 47.0	11	8 18 46.43	+3.519	+19 18 36.7	−11.57	18 59.7
14	7 58 39.39	0.774	20 17 56.1	− 0.80	6 31.3	15	8 18 59.45	2.988	19 17 53.9	9.84	18 44.2
18	7 58 43.60	1.335	20 17 49.7	2.39	6 15.6	19	8 19 10.32	2.447	19 17 18.1	8.08	18 28.6
22	7 58 50.06	1.890	20 17 37.0	3.98	6 0.0	23	8 19 19.02	1.900	19 16 49.3	6.28	18 13.1
26	7 58 58.72	2.435	20 17 17.9	5.55	5 44.4	27	8 19 25.52	1.344	19 16 27.9	4.45	17 57.4
30	7 59 9.53	+2.970	+20 16 52.6	− 7.09	5 28.9	31	8 19 29.78	+0.782	+19 16 13.7	− 2.60	17 41.8
ay 4	7 59 22.46	3.494	20 16 21.2	8.60	5 13.4	Nov. 4	8 19 31.77	+0.214	19 16 7.1	− 0.71	17 26.1
8	7 59 37.46	4.006	20 15 43.8	10.09	4 57.9	8	8 19 31.50	−0.353	19 16 8.1	+ 1.18	17 10.3
12	7 59 54.49	4.504	20 15 0.5	11.57	4 42.4	12	8 19 28.96	0.911	19 16 16.5	3.05	16 54.6
16	8 0 13.47	4.984	20 14 11.3	13.01	4 27.0	16	8 19 24.21	1.463	19 16 32.4	4.88	16 38.7
20	8 0 34.33	+5.443	+20 13 16.5	−14.40	4 11.7	20	8 19 17.27	−2.005	+19 16 55.5	+ 6.68	16 22.9
24	8 0 56.98	5.879	20 12 16.2	15.72	3 56.3	24	8 19 8.19	2.535	19 17 25.7	8.45	16 7.0
28	8 1 21.33	6.292	20 11 10.8	16.99	3 41.0	28	8 18 57.01	3.051	19 18 3.0	10.17	15 51.1
June 1	8 1 47.28	6.682	20 10 0.3	18.22	3 25.7	Dec. 2	8 18 43.81	3.548	19 18 47.0	11.81	15 35.1
5	8 2 14.76	7.051	20 8 45.1	19.40	3 10.4	6	8 18 28.66	4.023	19 19 37.4	13.39	15 19.2
9	8 2 43.66	+7.395	+20 7 25.2	−20.52	2 55.2	10	8 18 11.66	−4.473	+19 20 34.0	+14.88	15 3.1
13	8 3 13.89	7.713	20 6 1.0	21.58	2 39.9	14	8 17 52.92	4.891	19 21 36.2	16.24	14 47.1
17	8 3 45.33	8.002	20 4 32.7	22.56	2 24.7	18	8 17 32.57	5.278	19 22 43.8	17.50	14 31.0
21	8 4 17.86	8.259	20 3 0.7	23.46	2 9.6	22	8 17 10.74	5.632	19 23 56.1	18.65	14 14.9
25	8 4 51.36	8.487	20 1 25.2	24.28	1 54.4	26	8 16 47.57	5.948	19 25 12.8	19.68	13 58.8
29	8 5 25.72	+8.689	+19 59 46.6	−25.02	1 39.2	30	8 16 23.21	−6.229	+19 26 33.4	+20.58	13 42.7
July 3	8 6 0.83	+8.861	+19 58 5.2	−25.70	1 24.1	34	8 15 57.79	−6.471	+19 27 57.3	+21.35	13 26.5

Greatest semidiameter,	January	19,	1″.33	**Greatest horizontal parallax,**	January	19,	0″.30
Least semidiameter,	July	23,	1″.25	**Least horizontal parallax,**	July	23,	0″.28

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth—	
							At Date.	At Interm diate Date
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 1	272 18 49.5	2 48 49.6	+12 52.3	−4 57 48.5	−14 33.3	9.664 4806	0.158 6808	0.158 59
2	275 8 21.0	2 50 15.5	12 48.3	5 12 3.2	13 55.7	9.662 8071	0.158 4642	0.158 29
3	277 59 25.0	2 51 54.6	12 36.7	5 25 39.2	13 16.0	9.660 8699	0.158 0757	0.157 816
4	280 52 14.8	2 53 47.4	12 17.4	5 38 34.3	12 33.8	9.658 6679	0.157 5128	0.157 16
5	283 47 4.4	2 55 54.1	11 50.3	5 50 45.8	11 48.9	9.656 2001	0.156 7721	0.156 33
6	286 44 7.8	2 58 15.2	+11 15.4	−6 2 11.0	−11 1.1	9.653 4657	0.155 8497	0.155 319
7	289 43 39.8	3 0 51.2	10 32.8	6 12 47.0	10 10.2	9.650 4638	0.154 7411	0.154 11
8	292 45 55.5	3 3 42.7	9 42.5	6 22 30.4	9 15.8	9.647 1935	0.153 4411	0.152 717
9	295 51 10.7	3 6 50.3	8 44.7	6 31 17.4	8 17.5	9.643 6545	0.151 9434	0.151 11
10	298 59 41.8	3 10 14.6	7 39.7	6 39 4.0	7 15.0	9.639 8467	0.150 2411	0.149 311
11	302 11 45.8	3 13 56.3	+ 6 27.9	−6 45 45.9	− 6 7.9	9.635 7705	0.148 3270	0.147 287
12	305 27 40.4	3 17 56.0	5 9.7	6 51 18.1	4 55.7	9.631 4272	0.146 1918	0.145 03
13	308 47 44.0	3 22 14.4	3 45.7	6 55 35.4	3 37.9	9.626 8183	0.143 8261	0.142 55
14	312 12 15.6	3 26 52.2	2 16.8	6 58 31.9	2 14.0	9.621 9473	0.141 2199	0.139 82
15	315 41 35.1	3 31 50.1	+ 0 43.8	7 0 1.3	− 0 43.7	9.616 8181	0.138 3611	0.136 83
16	319 16 2.9	3 37 9.0	− 0 52.2	−6 59 57.0	+ 0 53.5	9.611 4367	0.135 2372	0.133 57
17	322 56 0.3	3 42 49.4	2 29.7	6 58 11.8	2 38.2	9.605 8107	0.131 8342	0.130 02
18	326 41 49.0	3 48 51.7	4 7.3	6 54 38.0	4 30.7	9.599 9502	0.128 1371	0.126 17
19	330 33 51.1	3 55 16.3	5 43.2	6 49 7.6	6 31.5	9.593 8680	0.124 1295	0.122 00
20	334 32 29.0	4 2 3.4	7 15.3	6 41 32.1	8 40.9	9.587 5798	0.119 7939	0.117 497
21	338 38 5.4	4 9 13.1	− 8 41.5	−6 31 42.9	+10 58.9	9.581 1055	0.115 1113	0.112 63
22	342 51 2.5	4 16 44.8	9 59.2	6 19 31.4	13 25.5	9.574 4691	0.110 0617	0.107 39
23	347 11 42.0	4 24 37.8	11 5.8	6 4 49.1	16 0.5	9.567 6996	0.104 6237	0.101 75
24	351 40 24.8	4 32 50.9	11 58.6	5 47 27.9	18 43.1	9.560 8313	0.098 7747	0.095 689
25	356 17 29.8	4 41 22.0	12 34.7	5 27 20.6	21 32.4	9.553 9048	0.092 4921	0.089 180
26	1 3 13.9	4 50 8.5	−12 51.4	−5 4 21.4	+24 26.6	9.546 9674	0.085 7522	0.082 20
27	5 57 50.9	4 59 7.0	12 46.4	4 38 26.3	27 23.8	9.540 0737	0.078 5314	0.074 73
28	11 1 30.5	5 8 13.0	12 17.8	4 9 33.7	30 21.2	9.533 2852	0.070 8070	0.066 749
29	16 14 17.7	5 17 21.0	11 24.2	3 37 45.1	33 15.1	9.526 6707	0.062 5574	0.058 229
30	21 36 11.1	5 26 24.4	10 5.3	3 3 6.1	36 1.2	9.520 3060	0.053 7633	0.049 157
31	27 7 2.3	5 35 15.3	− 8 22.1	−2 25 46.9	+38 34.7	9.514 2724	0.044 4094	0.039 519
Feb. 1	32 46 34.5	5 43 44.9	6 16.8	1 46 2.8	40 50.0	9.508 6556	0.034 4854	0.029 308
2	38 34 21.7	5 51 43.5	3 53.1	1 4 14.9	42 41.2	9.503 5433	0.023 9872	0.018 52
3	44 29 47.7	5 59 0.7	− 1 16.4	−0 20 50.2	44 2.7	9.499 0229	0.012 9197	0.007 170
4	50 32 5.7	6 5 25.8	+ 1 26.7	+0 23 38.8	44 49.0	9.495 1773	0.001 2983	9.995 288
5	56 40 18.4	6 10 48.3	+ 4 8.4	+1 8 34.6	+44 55.6	9.492 0820	9.989 1509	9.982 89
6	62 53 18.3	6 14 58.6	6 40.5	1 53 15.8	44 19.5	9.489 8012	9.976 5200	9.970 041
7	69 9 49.0	6 17 48.6	8 54.8	2 36 58.9	42 59.4	9.488 3840	9.963 4646	9.956 801
8	75 28 26.8	6 19 12.0	10 43.8	3 19 0.2	40 56.1	9.487 8619	9.950 0616	9.943 259
9	81 47 43.1	6 19 5.1	12 1.7	3 58 37.6	38 12.4	9.488 2467	9.936 4072	9.929 520
10	88 6 6.9	6 17 27.3	+12 44.4	+4 35 13.1	+34 53.2	9.489 5296	9.922 6162	9.915 710
11	94 22 8.1	6 14 20.7	12 50.1	5 8 14.3	31 5.1	9.491 6822	9.908 8231	9.901 972
12	100 34 20.2	6 9 50.3	12 19.7	5 37 16.0	26 55.4	9.494 6578	9.895 1799	9.888 465
13	106 41 23.1	6 4 3.7	11 16.0	6 2 0.6	22 32.2	9.498 3943	9.881 8525	9.875 36
14	112 42 5.4	5 57 10.7	9 43.6	6 22 18.5	18 3.4	9.502 8177	9.869 0182	9.862 843
15	118 35 26.0	5 49 22.2	+ 7 48.4	+6 38 7.8	+13 36.1	9.507 8458	9.856 8597	9.851 090
16	124 20 35.1	5 40 49.6	+ 5 37.0	+6 49 33.1	+ 9 16.4	9.513 3918	9.845 5587	9.840 284

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
eb. 15	118 35 26.0	5 49 22.2	+ 7 48.4	+6 38 7.8	+13 36.1	9.507 8458	9.856 8597	9.851 0909
16	124 20 35.1	5 40 49.6	5 37.0	6 49 33.1	9 16.4	9.513 3918	9.845 5587	9.840 2844
17	129 56 54.4	5 31 44.5	3 16.0	6 56 44.7	5 9.4	9.519 3678	9.835 2881	9.830 5888
18	135 23 57.0	5 22 18.0	+ 0 51.7	6 59 57.3	+ 1 18.7	9.525 6877	9.826 2038	9.822 1487
19	140 41 26.6	5 12 40.1	− 1 30.2	6 59 28.3	− 2 13.3	9.532 2693	9.818 4372	9.815 0808
20	145 49 16.2	5 2 59.6	− 3 44.9	+6 55 37.4	− 5 25.1	9.539 0361	9.812 0886	9.809 4673
21	150 47 27.2	4 53 24.0	5 48.6	6 48 44.9	8 16.4	9.545 9181	9.807 2211	9.805 3517
22	155 36 7.7	4 43 59.5	7 38.6	6 39 11.2	10 47.6	9.552 8524	9.803 8584	9.802 7381
23	160 15 31.4	4 34 51.0	9 12.8	6 27 16.1	12 59.4	9.559 7837	9.801 9853	9.801 5923
24	164 45 56.3	4 26 2.3	10 30.3	6 13 18.5	14 52.9	9.566 6636	9.801 5497	9.801 8463
25	169 7 43.4	4 17 36.0	−11 30.6	+5 57 35.8	−16 29.7	9.573 4505	9.802 4693	9.803 4048
26	173 21 16.3	4 9 34.0	12 13.9	5 40 24.1	17 51.3	9.580 1091	9.804 6377	9.806 1522
27	177 26 59.8	4 1 57.3	12 40.7	5 21 57.7	18 59.2	9.586 6097	9.807 9318	9.809 9598
28	181 25 19.6	3 54 46.5	12 51.8	5 2 29.8	19 54.9	9.592 9274	9.812 2192	9.814 6930
ar. 1	185 16 41.5	3 48 1.5	12 48.5	4 42 11.7	20 39.7	9.599 0420	9.817 3647	9.820 2177
2	189 1 31.3	3 41 42.2	−12 31.9	+4 21 13.6	−21 15.0	9.604 9371	9.823 2358	9.826 4039
3	192 40 14.4	3 35 48.0	12 3.4	3 59 44.5	21 42.0	9.610 5994	9.829 7072	9.833 1314
4	196 13 15.6	3 30 18.2	11 24.4	3 37 52.0	22 1.8	9.616 0185	9.836 6631	9.840 2895
5	199 40 58.8	3 25 11.9	10 36.2	3 15 42.9	22 15.4	9.621 1864	9.843 9988	9.847 7796
6	203 3 47.0	3 20 28.2	9 40.1	2 53 23.0	22 23.6	9.626 0969	9.851 6214	9.855 5146
7	206 22 2.5	3 16 6.3	− 8 37.4	+2 30 57.2	−22 27.1	9.630 7456	9.859 4502	9.863 4200
8	209 36 6.5	3 12 5.0	7 29.3	2 8 30.0	22 26.6	9.635 1293	9.867 4164	9.871 4322
9	212 46 19.1	3 8 23.5	6 16.9	1 46 5.1	22 22.6	9.639 2460	9.875 4610	9.879 4970
10	215 52 59.8	3 5 0.9	5 1.4	1 23 45.7	22 15.7	9.643 0945	9.883 5348	9.887 5696
11	218 56 27.0	3 1 56.4	3 43.6	1 1 34.5	22 6.2	9.646 6743	9.891 5971	9.895 6134
12	221 56 58.5	2 59 9.2	− 2 24.6	+0 39 34.0	−21 54.4	9.649 9854	9.899 6150	9.903 5987
13	224 54 51.1	2 56 38.6	− 1 5.2	+0 17 46.3	21 40.6	9.653 0280	9.907 5618	9.911 5018
14	227 50 20.9	2 54 23.8	+ 0 13.9	−0 3 46.9	21 25.2	9.655 8029	9.915 4164	9.919 3036
15	230 43 43.6	2 52 24.2	1 31.9	0 25 3.8	21 8.3	9.658 3110	9.923 1618	9.926 9895
16	233 35 14.1	2 50 39.2	2 48.1	0 46 3.1	20 50.0	9.660 5532	9.930 7855	9.934 5486
17	236 25 6.7	2 49 8.3	+ 4 1.9	−1 6 43.5	−20 30.5	9.662 5305	9.938 2781	9.941 9730
18	239 13 35.3	2 47 51.2	5 12.7	1 27 3.7	20 9.8	9.664 2439	9.945 6327	9.949 2567
19	242 0 53.6	2 46 47.4	6 20.1	1 47 2.7	19 48.0	9.665 6944	9.952 8446	9.956 3962
20	244 47 14.6	2 45 56.7	7 23.5	2 6 39.4	19 25.1	9.666 8829	9.959 9111	9.963 3892
21	247 32 51.3	2 45 18.7	8 22.4	2 25 52.7	19 1.2	9.667 8099	9.966 8305	9.970 2350
22	250 17 56.2	2 44 53.2	+ 9 16.5	−2 44 41.5	−18 36.3	9.668 4761	9.973 6027	9.976 9337
23	253 2 41.9	2 44 40.0	10 5.3	3 3 4.9	18 10.3	9.668 8821	9.980 2282	9.983 4863
24	255 47 20.5	2 44 39.1	10 48.5	3 21 1.8	17 43.2	9.669 0280	9.986 7082	9.989 8941
25	258 32 4.3	2 44 50.5	11 25.7	3 38 31.0	17 15.0	9.668 9139	9.993 0444	9.996 1592
26	261 17 5.6	2 45 14.1	11 56.7	3 55 31.3	16 45.4	9.668 5397	9.999 2389	0.002 2837
27	264 2 36.6	2 45 49.9	+12 21.0	−4 12 1.3	−16 14.4	9.667 9053	0.005 2940	0.008 2699
28	266 48 49.5	2 46 38.0	12 38.6	4 27 59.7	15 42.1	9.667 0101	0.011 2118	0.014 1202
29	269 35 56.8	2 47 38.6	12 49.1	4 43 24.9	15 8.1	9.665 8536	0.016 9952	0.019 8370
30	272 24 11.0	2 48 52.0	12 52.3	4 58 15.3	14 32.3	9.664 4352	0.022 6460	0.025 4226
31	275 13 45.1	2 50 18.3	12 48.0	5 12 28.9	13 54.5	9.662 7540	0.028 1668	0.030 8790
Apr. 1	278 4 52.0	2 51 57.8	+12 36.2	−5 26 3.7	−13 14.6	9.660 8091	0.033 5594	0.036 2081
2	280 57 45.2	2 53 50.9	+12 16.7	−5 38 57.4	−12 32.3	9.658 5993	0.038 8253	0.041 4113

MERCURY.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth—	
								At Date.	At Interm diate Dat
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr.	1	278 4 52.0	2 51 57.8	+12 36.2	−5 26 3.7	−13 14.6	9.660 8091	0.033 5594	0.036 20
	2	280 57 45.2	2 53 50.9	12 16.7	5 38 57.4	12 32.3	9.658 5993	0.038 8253	0.041 41
	3	283 52 38.5	2 55 58.0	11 49.3	5 51 7.5	11 47.4	9.656 1237	0.043 9661	0.046 48
	4	286 49 46.1	2 58 19.6	11 14.2	6 2 31.3	10 59.6	9.653 3814	0.048 9826	0.051 44
	5	289 49 22.7	3 0 56.1	10 31.3	6 13 5.7	10 8.6	9.650 3714	0.053 8756	0.056 27
	6	292 51 43.4	3 3 48.1	+ 9 40.8	−6 22 47.4	− 9 14.1	9.647 0931	0.058 6452	0.060 98
	7	295 57 4.1	3 6 56.2	8 42.8	6 31 32.6	8 15.7	9.643 5462	0.063 2911	0.065 56
	8	299 5 41.3	3 10 21.0	7 37.6	6 39 17.3	7 13.0	9.639 7306	0.067 8125	0.070 02
	9	302 17 51.9	3 14 3.1	6 25.6	6 45 57.1	6 5.7	9.635 6466	0.072 2079	0.074 35
	10	305 33 53.5	3 18 3.2	5 7.2	6 51 27.1	4 53.3	9.631 2953	0.076 4753	0.078 56
	11	308 54 4.6	3 22 22.2	+ 3 43.1	−6 55 41.9	− 3 35.3	9.626 6788	0.080 6121	0.082 63
	12	312 18 44.4	3 27 0.7	2 14.0	6 58 35.8	2 11.4	9.621 8001	0.084 6148	0.086 56
	13	315 48 12.7	3 31 59.3	+ 0 40.9	7 0 2.6	− 0 41.0	9.616 6634	0.088 4790	0.090 35
	14	319 22 50.0	3 37 18.8	− 0 55.1	6 59 55.4	+ 0 56.5	9.611 2745	0.092 1996	0.094 00
	15	323 2 57.4	3 42 59.8	2 32.7	6 58 7.0	2 41.5	9.605 6413	0.095 7703	0.097 49
	16	326 48 56.8	3 49 2.7	− 4 10.3	−6 54 29.8	+ 4 34.3	9.599 7740	0.099 1837	0.100 82
	17	330 41 10.2	3 55 27.9	5 46.1	6 48 55.7	6 35.4	9.593 6854	0.102 4318	0.103 99
	18	334 40 0.1	4 2 15.7	7 18.1	6 41 16.3	8 45.0	9.587 3914	0.105 5048	0.106 97
	19	338 45 49.1	4 9 26.0	8 44.0	6 31 22.9	11 3.2	9.580 9119	0.108 3917	0.109 76
	20	342 58 59.5	4 16 58.4	10 1.4	6 19 7.0	13 30.0	9.574 2712	0.111 0803	0.112 34
	21	347 19 53.0	4 24 52.1	−11 7.6	−6 4 20.0	+16 5.3	9.567 4982	0.113 5569	0.114 71
	22	351 48 50.3	4 33 5.7	11 59.9	5 46 53.9	18 48.2	9.560 6275	0.115 8062	0.116 84
	23	356 26 10.4	4 41 37.3	12 35.5	5 26 41.5	21 37.6	9.553 6999	0.117 8115	0.118 71
	24	1 12 10.0	4 50 24.2	12 51.6	5 3 37.1	24 31.9	9.546 7630	0.119 5548	0.120 32
	25	6 7 2.9	4 59 23.0	12 45.9	4 37 36.7	27 29.2	9.539 8714	0.121 0167	0.121 63
	26	11 10 58.7	5 8 29.2	−12 16.5	−4 8 38.7	+30 26.5	9.533 0868	0.122 1763	0.122 63
	27	16 24 2.0	5 17 37.2	11 22.2	3 36 44.9	33 20.2	9.526 4784	0.123 0119	0.123 30
	28	21 46 11.5	5 26 40.3	10 2.6	3 2 1.0	36 6.1	9.520 1221	0.123 5007	0.123 60
	29	27 17 18.4	5 35 30.7	8 18.7	2 24 37.2	38 39.1	9.514 0994	0.123 6197	0.123 53
	30	32 57 5.7	5 43 59.5	6 12.7	1 44 49.0	40 53.7	9.508 4961	0.123 3462	0.123 05
May	1	38 45 7.0	5 51 57.1	− 3 48.6	−1 2 57.8	+42 44.1	9.503 4000	0.122 6583	0.122 15
	2	44 40 46.0	5 59 12.9	− 1 11.6	−0 19 30.7	44 4.6	9.498 8982	0.121 5347	0.120 80
	3	50 43 15.5	6 5 36.3	+ 1 31.6	+0 24 59.7	44 49.7	9.495 0735	0.119 9569	0.118 90
	4	56 51 37.8	6 10 56.9	4 13.2	1 9 55.6	44 55.1	9.492 0013	0.117 9092	0.116 70
	5	63 4 45.2	6 15 5.1	6 44.8	1 54 35.7	44 17.7	9.489 7453	0.115 3790	0.113 93
	6	69 21 21.1	6 17 52.6	+ 8 58.5	+2 38 16.4	+42 56.3	9.488 3542	0.112 3579	0.110 66
	7	75 40 1.5	6 19 13.4	10 46.7	3 20 13.9	40 51.8	9.487 8588	0.108 8423	0.106 80
	8	81 59 17.7	6 19 3.8	12 3.5	3 59 46.4	38 7.0	9.488 2703	0.104 8333	0.102 64
	9	88 17 38.7	6 17 23.2	12 45.1	4 36 16.0	34 46.8	9.489 5794	0.100 3369	0.097 90
	10	94 33 34.5	6 14 14.0	12 49.7	5 9 10.4	30 57.7	9.491 7572	0.095 3640	0.092 70
	11	100 45 38.7	6 9 41.1	+12 18.3	+5 38 4.5	+26 47.5	9.494 7563	0.089 9293	0.087 04
	12	106 52 31.4	6 3 52.4	11 13.6	6 2 41.1	22 24.2	9.498 5142	0.084 0509	0.080 95
	13	112 53 1.6	5 56 57.7	9 40.5	6 22 51.0	17 55.4	9.502 9566	0.077 7507	0.074 44
	14	118 46 8.5	5 49 7.8	7 44.7	6 38 32.3	13 28.1	9.508 0012	0.071 0526	0.067 56
	15	124 31 2.5	5 40 34.1	5 32.8	6 49 49.8	9 8.7	9.513 5613	0.063 9815	0.060 31
	16	130 7 5.8	5 31 28.2	+ 3 11.6	+6 56 54.0	+ 5 2.2	9.519 5488	0.056 5636	0.052 73
	17	135 33 51.8	5 22 1.2	+ 0 47.3	+6 59 59.6	+ 1 12.0	9.525 8777	0.048 8253	0.044 84

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
lay 16	130 7 5.8	5 31 28.2	+ 3 11.6	+6 56 54.0	+ 5 2.2	9.519 5488	0.056 5636	0.052 7329
17	135 33 51.8	5 22 1.2	+ 0 47.3	6 59 59.6	+ 1 12.0	9.525 8777	0.048 8253	0.044 8440
18	140 51 4.4	5 12 23.0	− 1 34.4	6 59 24.2	− 2 19.4	9.532 4660	0.040 7923	0.036 6733
19	145 58 37.0	5 2 42.5	3 48.8	6 55 27.5	5 30.6	9.539 2373	0.032 4901	0.028 2458
20	150 56 31.0	4 53 7.1	5 52.2	6 48 29.8	8 21.3	9.546 1218	0.023 9433	0.019 5855
21	155 44 54.9	4 43 43.0	− 7 41.7	+6 38 51.5	−10 51.8	9.553 0570	0.015 1753	0.010 7154
22	160 24 2.4	4 34 35.1	9 15.5	6 26 52.5	13 3.0	9.559 9875	0.006 2086	0.001 6574
23	164 54 11.6	4 25 47.0	10 32.4	6 12 51.4	14 56.1	9.566 8653	9.997 0644	9.992 4321
24	169 15 43.8	4 17 21.4	11 32.2	5 57 5.7	16 32.5	9.573 6490	9.987 7630	9.983 0595
25	173 29 2.5	4 9 20.2	12 14.9	5 39 51.4	17 53.6	9.580 3033	9.978 3239	9.973 5586
26	177 34 32.5	4 1 44.3	−12 41.2	+5 21 23.0	−19 1.1	9.586 7988	9.968 7658	9.963 9477
27	181 32 39.6	3 54 34.2	12 51.9	5 1 53.3	19 56.4	9.593 1109	9.959 1066	9.954 2447
28	185 23 49.5	3 47 49.9	12 48.2	4 41 33.8	20 40.9	9.599 2193	9.949 3642	9.944 4672
29	189 8 28.0	3 41 31.4	12 31.2	4 20 34.7	21 16.0	9.605 1077	9.939 5560	9.934 6329
30	192 47 0.7	3 35 38.0	12 2.4	3 59 4.7	21 42.8	9.610 7630	9.929 7001	9.924 7597
31	196 19 52.1	3 30 8.8	−11 23.1	+3 37 11.5	−22 2.4	9.616 1748	9.919 8140	9.914 8654
me 1	199 47 26.2	3 25 3.2	10 34.6	3 15 2.0	22 15.8	9.621 3351	9.909 9162	9.904 9689
2	203 10 6.1	3 20 20.2	9 38.3	2 52 41.8	22 23.8	9.626 2380	9.900 0260	9.895 0900
3	206 28 13.8	3 15 58.8	8 35.4	2 30 15.9	22 27.2	9.630 8789	9.890 1637	9.885 2497
4	209 42 10.6	3 11 58.1	7 27.1	2 7 48.7	22 26.6	9.635 2548	9.880 3509	9.875 4702
5	212 52 16.6	3 8 17.2	− 6 14.6	+1 45 23.9	−22 22.6	9.639 3637	9.870 6108	9.865 7758
6	215 58 51.3	3 4 55.2	4 59.0	1 23 4.6	22 15.5	9.643 2043	9.860 9684	9.856 1922
7	219 2 13.1	3 1 51.3	3 41.2	1 0 53.7	22 5.9	9.646 7762	9.851 4509	9.846 7482
8	222 2 39.6	2 59 4.6	2 22.2	0 38 53.5	21 54.1	9.650 0794	9.842 0879	9.837 4741
9	225 0 27.7	2 56 34.4	− 1 2.7	+0 17 6.2	21 40.3	9.653 1140	9.832 9112	9.828 4035
10	227 55 53.6	2 54 20.0	+ 0 16.3	−0 4 26.5	−21 24.8	9.655 8809	9.823 9554	9.819 5718
11	230 49 12.7	2 52 20.8	1 34.2	0 25 42.9	21 7.8	9.658 3811	9.815 2578	9.811 0183
12	233 40 40.0	2 50 36.3	2 50.4	0 46 41.7	20 49.4	9.660 6155	9.806 8587	9.802 7843
13	236 30 29.9	2 49 5.9	4 4.1	1 7 21.5	20 29.8	9.662 5850	9.798 8008	9.794 9139
14	239 18 56.3	2 47 49.2	5 14.9	1 27 41.1	20 9.1	9.664 2906	9.791 1295	9.787 4537
15	242 6 12.7	2 46 45.8	+ 6 22.1	−1 47 39.4	−19 47.3	9.665 7332	9.783 8926	9.780 4525
16	244 52 32.2	2 45 55.4	7 25.4	2 7 15.3	19 24.4	9.666 9138	9.777 1397	9.773 9607
17	247 38 7.7	2 45 17.8	8 24.2	2 26 27.9	19 0.5	9.667 8330	9.770 9218	9.768 0294
18	250 23 11.9	2 44 52.7	9 18.1	2 45 16.0	18 35.5	9.668 4914	9.765 2899	9.762 7096
19	253 7 57.2	2 44 39.9	10 6.7	3 3 38.6	18 9.4	9.668 8895	9.760 2948	9.758 0515
20	255 52 35.8	2 44 39.4	+10 49.7	−3 21 34.6	−17 42.3	9.669 0275	9.755 9859	9.754 1037
21	258 37 20.0	2 44 51.1	11 26.7	3 39 2.9	17 14.1	9.668 9057	9.752 4103	9.750 9110
22	261 22 22.0	2 45 15.0	11 57.5	3 56 2.3	16 44.5	9.668 5238	9.749 6106	9.748 5136
23	264 7 54.1	2 45 51.2	12 21.7	4 12 31.4	16 13.5	9.667 8815	9.747 6243	9.746 9464
24	266 54 8.5	2 46 39.7	12 39.0	4 28 28.8	15 41.1	9.666 9785	9.746 4831	9.746 2373
25	269 41 17.6	2 47 40.7	+12 49.3	−4 43 53.0	−15 7.0	9.665 8142	9.746 2111	9.746 4062
26	272 29 34.1	2 48 54.5	12 52.3	4 58 42.3	14 31.2	9.664 3878	9.746 8238	9.747 4644
27	275 19 10.8	2 50 21.1	12 47.8	5 12 54.7	13 53.4	9.662 6986	9.748 3279	9.749 4138
28	278 10 20.7	2 52 1.0	12 35.7	5 26 28.2	13 13.4	9.660 7455	9.750 7208	9.752 2471
29	281 3 17.3	2 53 54.6	12 15.9	5 39 20.6	12 31.0	9.658 5275	9.753 9905	9.755 9482
30	283 58 14.5	2 56 2.1	+11 48.4	−5 51 29.3	−11 46.0	9.656 0438	9.758 1167	9.760 4921
July 1	286 55 26.4	2 58 24.1	+11 13.0	−6 2 51.6	−10 58.1	9.653 2935	9.763 0703	9.765 8464

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fro Earth—	
							At Date.	At Interm diate Date
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 1	286 55 26.4	2 58 24.1	+11 13.0	−6 2 51.6	−10 58.1	9.653 2935	9.763 0703	9.765 8
2	289 55 7.7	3 1 1.1	10 29.9	6 13 24.4	10 7.0	9.650 2756	9.768 8154	9.771 97
3	292 57 33.8	3 3 53.6	9 39.1	6 23 4.4	9 12.4	9.646 9892	9.775 3104	9.778 82
4	296 3 0.3	3 7 2.1	8 40.9	6 31 47.9	8 13.9	9.643 4341	9.782 5081	9.786 35
5	299 11 43.6	3 10 27.4	7 35.5	6 39 30.7	7 11.0	9.639 6102	9.790 3577	9.794 51
6	302 24 0.9	3 14 10.1	+ 6 23.3	−6 46 8.4	− 6 3.5	9.635 5179	9.798 8061	9.803 23
7	305 40 9.9	3 18 10.9	5 4.7	6 51 36.1	4 50.9	9.631 1585	9.807 7987	9.812 48
8	309 0 29.0	3 22 30.4	3 40.4	6 55 48.5	3 32.8	9.626 5339	9.817 2806	9.822 18
9	312 25 17.3	3 27 9.4	2 11.2	6 58 39.8	2 8.7	9.621 6473	9.827 1971	9.832 30
10	315 54 54.6	3 32 8.7	+ 0 38.0	7 0 3.8	− 0 38.0	9.616 5028	9.837 4948	9.842 77
11	319 29 41.6	3 37 28.9	− 0 58.1	−6 59 53.6	+ 0 59.7	9.611 1063	9.848 1212	9.853 54
12	323 9 59.5	3 43 10.5	2 35.7	6 58 2.0	2 44.8	9.605 4658	9.859 0261	9.864 56
13	326 56 9.9	3 49 14.0	4 13.2	6 54 21.3	4 37.8	9.599 5915	9.870 1612	9.875 80
14	330 48 35.0	3 55 40.0	5 49.0	6 48 43.5	6 39.2	9.593 4963	9.881 4801	9.887 19
15	334 47 37.4	4 2 28.6	7 20.8	6 41 0.1	8 49.1	9.587 1963	9.892 9385	9.898 70
16	338 53 39.6	4 9 39.5	− 8 46.5	−6 31 2.5	+11 7.6	9.580 7115	9.904 4940	9.910 29
17	343 7 3.8	4 17 12.5	10 3.6	6 18 42.0	13 34.7	9.574 0661	9.916 1057	9.921
18	347 28 11.7	4 25 6.8	11 9.5	6 3 50.2	16 10.2	9.567 2895	9.927 7341	9.933 54
19	351 57 24.1	4 33 21.0	12 1.3	5 46 19.1	18 53.2	9.560 4164	9.939 3411	9.945 12
20	356 34 59.8	4 41 53.2	12 36.3	5 26 1.6	21 42.8	9.553 4877	9.950 8892	9.956 62
21	1 21 15.5	4 50 40.7	−12 51.8	−5 2 51.9	+24 37.4	9.546 5512	9.962 3414	9.968 02
22	6 16 24.8	4 59 39.8	12 45.4	4 36 46.0	27 34.7	9.539 6618	9.973 6613	9.979 26
23	11 20 37.3	5 8 46.0	12 15.2	4 7 42.6	30 31.9	9.532 8815	9.984 8124	9.990 31
24	16 33 57.4	5 17 53.8	11 20.1	3 35 43.5	33 25.4	9.526 2797	9.995 7586	0.001 14
25	21 56 23.4	5 26 56.7	9 59.7	3 0 54.4	36 10.9	9.519 9323	0.006 4639	0.011 71
26	27 27 46.5	5 35 46.6	− 8 15.1	−2 23 25.9	+38 43.4	9.513 9211	0.016 8920	0.021 99
27	33 7 49.4	5 44 14.7	6 8.5	1 43 33.7	40 57.4	9.508 3319	0.027 0074	0.031 93
28	38 56 5.4	5 52 11.2	3 43.9	1 1 39.1	42 47.0	9.503 2526	0.036 7753	0.041 51
29	44 51 57.7	5 59 25.6	− 1 6.6	−0 18 9.5	44 6.5	9.498 7702	0.046 1623	0.050 70
30	50 54 38.9	6 5 47.2	+ 1 36.6	+0 26 22.2	44 50.5	9.494 9675	0.055 1367	0.059 45
31	57 3 11.0	6 11 5.7	+ 4 18.0	+1 11 18.3	+44 54.6	9.491 9193	0.063 6693	0.067 76
Aug. 1	63 16 26.0	6 15 11.5	6 49.2	1 55 57.3	44 15.9	9.489 6888	0.071 7348	0.075 58
2	69 33 7.1	6 17 56.5	9 2.2	2 39 35.5	42 53.1	9.488 3245	0.079 3115	0.082 91
3	75 51 50.1	6 19 14.6	10 49.5	3 21 29.2	40 47.2	9.487 8568	0.086 3826	0.089 72
4	82 11 6.1	6 19 2.2	12 5.3	4 0 56.6	38 1.2	9.488 2960	0.092 9362	0.096 016
5	88 29 24.1	6 17 18.8	+12 45.8	+4 37 19.9	+34 40.1	9.489 6322	0.098 9659	0.101 78
6	94 45 14.2	6 14 6.8	12 49.3	5 10 7.3	30 50.4	9.491 8358	0.104 4707	0.107 02
7	100 57 10.1	6 9 31.6	12 16.8	5 38 53.8	26 39.7	9.494 8592	0.109 4550	0.111 75
8	107 3 52.3	6 3 40.8	11 11.2	6 3 22.4	22 16.0	9.498 6393	0.113 9277	0.115 97
9	113 4 9.8	5 56 44.2	9 37.2	6 23 24.0	17 47.1	9.503 1016	0.117 9021	0.119 707
10	118 57 2.3	5 48 52.7	+ 7 40.8	+6 38 57.1	+13 20.0	9.508 1634	0.121 3946	0.122 96
11	124 41 40.8	5 40 17.9	5 28.6	6 50 6.6	9 0.9	9.513 7378	0.124 4250	0.125 773
12	130 17 27.5	5 31 11.2	3 7.2	6 57 3.2	4 54.8	9.519 7370	0.127 0146	0.128 151
13	135 43 56.2	5 21 43.7	+ 0 42.9	7 0 1.7	+ 1 5.2	9.526 0750	0.129 1859	0.130 1219
14	141 0 51.2	5 12 5.3	− 1 38.7	6 59 19.9	− 2 25.6	9.532 6700	0.130 9621	0.131 709
15	146 8 6.0	5 2 24.8	− 3 52.8	+6 55 17.3	− 5 36.2	9.539 4460	0.132 3665	0.132 936
16	151 5 42.4	4 52 49.6	− 5 55.8	+6 48 14.3	− 8 26.3	9.546 3330	0.133 4221	0.133 825

MERCURY.

GREENWICH MEAN NOON.

ate.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
g. 16	151 5 42.4	4 52 49.6	− 5 55.8	+6 48 14.3	− 8 26.3	9.546 3330	0.133 4221	0.133 8259
17	155 53 49.1	4 43 26.0	7 44.8	6 38 31.4	10 56.2	9.553 2689	0.134 1506	0.134 3987
18	160 32 39.9	4 34 18.7	9 18.1	6 26 28.3	13 6.9	9.560 1986	0.134 5728	0.134 6754
19	165 2 33.0	4 25 31.2	10 34.5	6 12 23.7	14 59.4	9.567 0742	0.134 7087	0.134 6751
20	169 23 49.7	4 17 6.3	11 33.8	5 56 35.1	16 35.2	9.573 8545	0.134 5766	0.134 4152
21	173 36 53.7	4 9 5.8	−12 16.0	+5 39 18.3	−17 55.9	9.580 5045	0.134 1929	0.133 9118
22	177 42 9.8	4 1 30.6	12 41.8	5 20 47.8	19 3.0	9.586 9949	0.133 5736	0.133 1799
23	181 40 3.6	3 54 21.4	12 52.0	5 1 16.4	19 58.0	9.593 3010	0.132 7323	0.132 2325
24	185 31 1.2	3 47 38.0	12 47.9	4 40 55.5	20 42.1	9.599 4029	0.131 6817	0.131 0814
25	189 15 28.2	3 41 20.2	12 30.5	4 19 55.3	21 16.8	9.605 2844	0.130 4329	0.129 7374
26	192 53 50.0	3 35 27.5	−12 1.3	+3 58 24.5	−21 43.4	9.610 9324	0.128 9960	0.128 2097
27	196 26 31.3	3 29 59.2	11 21.7	3 36 30.7	22 2.9	9.616 3366	0.127 3795	0.126 5064
28	199 53 56.1	3 24 54.3	10 32.9	3 14 20.8	22 16.1	9.621 4893	0.125 5911	0.124 6345
29	203 16 27.3	3 20 11.9	9 36.4	2 52 0.3	22 24.0	9.626 3843	0.123 6373	0.122 6002
30	206 34 27.0	3 15 51.1	8 33.3	2 29 34.3	22 27.3	9.631 0172	0.121 5236	0.120 4083
31	209 48 16.4	3 11 51.0	− 7 24.9	+2 7 7.1	−22 26.5	9.635 3850	0.119 2546	0.118 0631
pt. 1	212 58 15.6	3 8 10.7	6 12.3	1 44 42.4	22 22.3	9.639 4856	0.116 8340	0.115 5678
2	216 4 44.1	3 4 49.3	4 56.6	1 22 23.4	22 15.2	9.643 3179	0.114 2647	0.112 9250
3	219 8 0.2	3 1 45.9	3 38.8	1 0 12.8	22 5.6	9.646 8815	0.111 5489	0.110 1366
4	222 8 21.6	2 58 59.7	2 19.7	0 38 13.0	21 53.7	9.650 1764	0.108 6882	0.107 2039
5	225 6 5.1	2 56 30.0	− 1 0.3	+0 16 26.0	−21 39.9	9.653 2028	0.105 6836	0.104 1273
6	228 1 26.8	2 54 16.1	+ 0 18.7	−0 5 6.2	21 24.3	9.655 9617	0.102 5350	0.100 9067
7	230 54 42.3	2 52 17.4	1 36.6	0 26 22.1	21 7.2	9.658 4538	0.099 2422	0.097 5414
8	233 46 6.4	2 50 33.3	2 52.7	0 47 20.3	20 48.8	9.660 6799	0.095 8042	0.094 0304
9	236 35 53.5	2 49 3.3	4 6.4	1 7 59.4	20 29.2	9.662 6413	0.092 2197	0.090 3719
10	239 24 17.5	2 47 47.0	+ 5 17.0	−1 28 18.3	−20 8.5	9.664 3388	0.088 4867	0.086 5638
11	242 11 31.9	2 46 44.0	6 24.1	1 48 16.0	19 46.7	9.665 7733	0.084 6029	0.082 6036
12	244 57 49.9	2 45 54.1	7 27.2	2 7 51.3	19 23.7	9.666 9458	0.080 5656	0.078 4884
13	247 43 24.3	2 45 16.8	8 25.9	2 27 3.1	18 59.7	9.667 8570	0.076 3715	0.074 2146
14	250 28 27.7	2 44 52.0	9 19.6	2 45 50.4	18 34.7	9.668 5075	0.072 0171	0.069 7786
15	253 13 12.5	2 44 39.7	+10 8.1	−3 4 12.2	−18 8.7	9.668 8975	0.067 4985	0.065 1763
16	255 57 51.1	2 44 39.6	10 50.9	3 22 7.4	17 41.6	9.669 0275	0.062 8115	0.060 4034
17	258 42 35.7	2 44 51.6	11 27.8	3 39 34.9	17 13.2	9.668 8976	0.057 9515	0.055 4551
18	261 27 38.4	2 45 15.9	11 58.3	3 56 33.4	16 43.5	9.668 5075	0.052 9136	0.050 3264
19	264 13 11.6	2 45 52.5	12 22.3	4 13 1.5	16 12.5	9.667 8571	0.047 6928	0.045 0121
20	266 59 27.5	2 46 41.4	+12 39.4	−4 28 57.9	−15 40.0	9.666 9461	0.042 2837	0.039 5068
21	269 46 38.5	2 47 42.8	12 49.5	4 44 21.0	15 5.9	9.665 7736	0.036 6808	0.033 8049
22	272 34 57.3	2 48 57.0	12 52.2	4 59 9.1	14 30.0	9.664 3389	0.030 8784	0.027 9006
23	275 24 36.7	2 50 24.0	12 47.5	5 13 20.4	13 52.2	9.662 6415	0.024 8708	0.021 7883
24	278 15 49.7	2 52 4.3	12 35.2	5 26 52.7	13 12.1	9.660 6803	0.018 6524	0.015 4625
25	281 8 49.8	2 53 58.3	+12 15.2	−5 39 43.8	−12 29.6	9.658 4542	0.012 2178	0.008 9177
26	284 3 50.9	2 56 6.3	11 47.3	5 51 51.1	11 44.5	9.655 9622	0.005 5617	0.002 1491
27	287 1 7.3	2 58 28.8	11 11.8	6 3 11.9	10 56.6	9.653 2034	9.998 6794	9.995 1522
28	290 0 53.5	3 1 6.2	10 28.4	6 13 43.2	10 5.4	9.650 1770	9.991 5671	9.987 9236
29	293 3 24.9	3 3 59.2	9 37.4	6 23 21.5	9 10.6	9.646 8822	9.984 2217	9.980 4613
30	296 8 57.3	3 7 8.2	+ 8 39.0	−6 32 3.1	− 8 11.9	9.643 3186	9.976 6423	9.972 7647
Oct. 1	299 17 47.0	3 10 34.0	+ 7 33.4	−6 39 44.0	− 7 9.0	9.639 4862	9.968 8289	9.964 8354

SATURN, 1915.

GREENWICH MEAN TIME.

SEPTEMBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m
1	6 58 39.79	+1.005	+22 10 16.0	−1.32	20 17.4
2	6 59 3.75	0.992	22 9 44.6	1.31	20 13.9
3	6 59 27.40	0.979	22 9 13.3	1.30	20 10.3
4	6 59 50.75	0.966	22 8 42.2	1.29	20 6.8
5	7 0 13.78	0.953	22 8 11.3	1.28	20 3.2
6	7 0 36.50	+0.940	+22 7 40.6	−1.27	19 59.6
7	7 0 58.89	0.926	22 7 10.1	1.26	19 56.1
8	7 1 20.95	0.912	22 6 40.0	1.25	19 52.5
9	7 1 42.68	0.898	22 6 10.1	1.24	19 48.9
10	7 2 4.07	0.884	22 5 40.5	1.23	19 45.4
11	7 2 25.12	+0.870	+22 5 11.2	−1.21	19 41.8
12	7 2 45.82	0.855	22 4 42.2	1.20	19 38.2
13	7 3 6.17	0.840	22 4 13.6	1.19	19 34.6
14	7 3 26.17	0.826	22 3 45.3	1.17	19 31.0
15	7 3 45.80	0.811	22 3 17.4	1.15	19 27.4
16	7 4 5.07	+0.795	+22 2 50.0	−1.14	19 23.7
17	7 4 23.98	0.780	22 2 22.9	1.12	19 20.1
18	7 4 42.51	0.764	22 1 56.2	1.10	19 16.5
19	7 5 0.67	0.749	22 1 30.0	1.08	19 12.9
20	7 5 18.44	0.733	22 1 4.2	1.06	19 9.2
21	7 5 35.84	+0.717	+22 0 38.9	−1.04	19 5.6
22	7 5 52.85	0.701	22 0 14.1	1.02	19 1.9
23	7 6 9.47	0.684	21 59 49.8	1.00	18 58.2
24	7 6 25.70	0.668	21 59 26.0	0.98	18 54.6
25	7 6 41.54	0.651	21 59 2.6	0.96	18 50.9
26	7 6 56.97	+0.635	+21 58 39.8	−0.94	18 47.2
27	7 7 12.00	0.618	21 58 17.6	0.91	18 43.5
28	7 7 26.62	0.601	21 57 55.9	0.89	18 39.8
29	7 7 40.82	0.583	21 57 34.8	0.87	18 36.1
30	7 7 54.61	0.566	21 57 14.3	0.84	18 32.4
31	7 8 7.98	+0.548	+21 56 54.4	−0.82	18 28.7
32	7 8 20.93	+0.530	+21 56 35.2	−0.79	18 25.0

Day of the Month.	6th.	14th.	22d.	30th.
	″	″	″	″
Semidiameter . . .	8.16	8.26	8.37	8.49
Horizontal Parallax	0.93	0.94	0.95	0.96

OCTOBER.

Day of Month.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Hour. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Hour. Noon.	Meri ian P sage
	h m s	s	° ′ ″	″	h
1	7 8 7.98	+0.548	+21 56 54.4	−0.82	18 28
2	7 8 20.93	0.530	21 56 35.2	0.79	18 25
3	7 8 33.44	0.512	21 56 16.5	0.76	18 21
4	7 8 45.52	0.494	21 55 58.5	0.74	18 17
5	7 8 57.17	0.476	21 55 41.2	0.71	18 13
6	7 9 8.38	+0.458	+21 55 24.5	−0.68	18 10
7	7 9 19.14	0.439	21 55 8.6	0.65	18 6
8	7 9 29.45	0.420	21 54 53.3	0.62	18 2
9	7 9 39.32	0.402	21 54 38.8	0.59	17 58
10	7 9 48.73	0.383	21 54 25.0	0.56	17 54
11	7 9 57.68	+0.364	+21 54 11.9	−0.53	17 51
12	7 10 6.18	0.345	21 53 59.6	0.50	17 47
13	7 10 14.22	0.325	21 53 48.0	0.47	17 43
14	7 10 21.80	0.306	21 53 37.2	0.43	17 39
15	7 10 28.91	0.287	21 53 27.2	0.40	17 35
16	7 10 35.55	+0.267	+21 53 18.0	−0.37	17 32
17	7 10 41.73	0.248	21 53 9.5	0.34	17 28
18	7 10 47.44	0.228	21 53 1.9	0.30	17 24
19	7 10 52.68	0.209	21 52 55.0	0.27	17 20
20	7 10 57.45	0.189	21 52 49.0	0.23	17 16
21	7 11 1.75	+0.169	+21 52 43.7	−0.20	17 12
22	7 11 5.58	0.150	21 52 39.3	0.17	17 9
23	7 11 8.93	0.130	21 52 35.7	0.13	17 5
24	7 11 11.80	0.110	21 52 33.0	0.10	17 1
25	7 11 14.20	0.090	21 52 31.0	0.06	16 57
26	7 11 16.12	+0.070	+21 52 29.9	−0.03	16 53
27	7 11 17.56	0.050	21 52 29.7	+0.01	16 49
28	7 11 18.52	0.030	21 52 30.3	0.04	16 45
29	7 11 18.99	+0.010	21 52 31.7	0.08	16 41
30	7 11 18.99	−0.010	21 52 34.0	0.11	16 37
31	7 11 18.50	−0.030	+21 52 37.2	+0.15	16 33
32	7 11 17.53	−0.050	+21 52 41.2	+0.18	16 29

Day of the Month.	8th.	16th.	24th.
	″	″	″
Semidiameter	8.61	8.74	8.8
Horizontal Parallax . . .	0.98	0.99	1.0

NOTE.—The sign + indicates north declinations.

GREENWICH MEAN TIME.

NOVEMBER.

Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
Noon.	Noon.	Noon.	Noon.	
h m s	s	° ′ ″	″	h m
7 11 17.53	−0.050	+21 52 41.2	+0.18	16 29.8
7 11 16.08	0.071	21 52 46.0	0.22	16 25.8
7 11 14.15	0.091	21 52 51.8	0.26	16 21.9
7 11 11.73	0.111	21 52 58.3	0.29	16 17.9
7 11 8.83	0.131	21 53 5.8	0.33	16 13.9
7 11 5.45	−0.151	+21 53 14.1	+0.36	16 9.9
7 11 1.59	0.171	21 53 23.2	0.40	16 5.9
7 10 57.25	0.191	21 53 33.2	0.43	16 1.9
7 10 52.44	0.210	21 53 44.1	0.47	15 57.9
7 10 47.16	0.230	21 53 55.8	0.50	15 53.9
7 10 41.40	−0.249	+21 54 8.3	+0.54	15 49.8
7 10 35.18	0.269	21 54 21.6	0.57	15 45.8
7 10 28.50	0.288	21 54 35.8	0.61	15 41.7
7 10 21.36	0.307	21 54 50.8	0.64	15 37.7
7 10 13.76	0.326	21 55 6.6	0.67	15 33.6
7 10 5.70	−0.345	+21 55 23.1	+0.71	15 29.6
7 9 57.20	0.363	21 55 40.5	0.74	15 25.5
7 9 48.26	0.382	21 55 58.6	0.77	15 21.4
7 9 38.88	0.400	21 56 17.4	0.80	15 17.3
7 9 29.06	0.418	21 56 37.0	0.83	15 13.2
7 9 18.81	−0.436	+21 56 57.4	+0.86	15 9.1
7 9 8.13	0.454	21 57 18.4	0.89	15 5.0
7 8 57.03	0.471	21 57 40.2	0.92	15 0.9
7 8 45.51	0.489	21 58 2.6	0.95	14 56.7
7 8 33.58	0.506	21 58 25.8	0.98	14 52.6
7 8 21.25	−0.522	+21 58 49.6	+1.01	14 48.5
7 8 8.51	0.539	21 59 14.0	1.03	14 44.3
7 7 55.37	0.555	21 59 39.2	1.06	14 40.2
7 7 41.85	0.572	22 0 4.9	1.09	14 36.0
7 7 27.94	0.587	22 0 31.3	1.11	14 31.8
7 7 13.66	−0.603	+22 0 58.2	+1.14	14 27.7
7 6 59.00	−0.618	+22 1 25.8	+1.16	14 23.5

DECEMBER.

Day of Month.	Apparent Right Ascension.	Var. of R. A. for 1 Hour.	Apparent Declination.	Var. of Decl. for 1 Hour.	Meridian Passage.
	Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m
1	7 7 13.66	−0.603	+22 0 58.2	+1.14	14 27.7
2	7 6 59.01	0.618	22 1 25.8	1.16	14 23.5
3	7 6 43.99	0.633	22 1 53.9	1.18	14 19.3
4	7 6 28.62	0.648	22 2 22.6	1.21	14 15.1
5	7 6 12.90	0.662	22 2 51.8	1.23	14 10.9
6	7 5 56.84	−0.676	+22 3 21.5	+1.25	14 6.7
7	7 5 40.46	0.690	22 3 51.7	1.27	14 2.5
8	7 5 23.75	0.703	22 4 22.3	1.29	13 58.3
9	7 5 6.74	0.715	22 4 53.5	1.31	13 54.1
10	7 4 49.42	0.728	22 5 25.0	1.32	13 49.9
11	7 4 31.82	−0.739	+22 5 56.9	+1.34	13 45.6
12	7 4 13.94	0.751	22 6 29.2	1.35	13 41.4
13	7 3 55.78	0.762	22 7 1.9	1.37	13 37.2
14	7 3 37.37	0.772	22 7 34.9	1.38	13 32.9
15	7 3 18.71	0.783	22 8 8.3	1.40	13 28.7
16	7 2 59.81	−0.792	+22 8 41.9	+1.41	13 24.4
17	7 2 40.68	0.802	22 9 15.8	1.42	13 20.2
18	7 2 21.34	0.810	22 9 49.9	1.43	13 15.9
19	7 2 1.79	0.819	22 10 24.3	1.44	13 11.7
20	7 1 42.04	0.827	22 10 58.9	1.45	13 7.4
21	7 1 22.11	−0.834	+22 11 33.7	+1.45	13 3.1
22	7 1 2.00	0.841	22 12 8.6	1.46	12 58.9
23	7 0 41.73	0.848	22 12 43.7	1.47	12 54.6
24	7 0 21.31	0.854	22 13 19.0	1.47	12 50.3
25	7 0 0.75	0.860	22 13 54.3	1.47	12 46.1
26	6 59 40.05	−0.865	+22 14 29.8	+1.48	12 41.8
27	6 59 19.24	0.869	22 15 5.3	1.48	12 37.5
28	6 58 58.32	0.874	22 15 40.8	1.48	12 33.2
29	6 58 37.31	0.877	22 16 16.5	1.48	12 28.9
30	6 58 16.21	0.881	22 16 52.1	1.48	12 24.7
31	6 57 55.05	−0.883	+22 17 27.7	+1.48	12 20.4
32	6 57 33.82	−0.885	+22 18 3.3	+1.48	12 16.1

Day of the Month.	1st.	9th.	17th.	25th.
	″	″	″	″
Semidiameter . . .	9.00	9.12	9.24	9.35
Horizontal Parallax	1.02	1.04	1.05	1.06

Day of Month.	3d.	11th.	19th.	27th.	35th.
	″	″	″	″	″
Semidiam.	9.45	9.53	9.59	9.62	9.64
Hor. Par. .	1.07	1.08	1.09	1.09	1.09

NOTE.—The sign + prefixed to the hourly change of declination indicates that north declinations are increasing sign – indicates that north declinations are decreasing.

URANUS, 1915.

GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.	Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
Jan. 0	20 49 49.31	+12.659	−18 23 56.8	+50.97	2 13.2	July 3	21 10 35.83	− 7.262	−17 1 11.4	−33.66	14 26.
4	20 50 40.67	13.010	18 20 29.8	52.48	1 58.3	7	21 10 5.80	7.744	17 3 30.0	35.57	14 10.
8	20 51 33.33	13.315	18 16 57.1	53.86	1 43.5	11	21 9 33.94	8.177	17 5 55.7	37.26	13 54
12	20 52 27.13	13.577	18 13 19.3	55.06	1 28.6	15	21 9 0.45	8.557	17 8 27.7	38.68	13 37.
16	20 53 21.89	13.791	18 9 37.0	56.06	1 13.8	19	21 8 25.56	8.879	17 11 4.8	39.82	13 21.
20	20 54 17.40	+13.951	−18 5 51.1	+56.86	0 59.0	23	21 7 49.50	− 9.142	−17 13 45.9	−40.69	13 5
24	20 55 13.44	14.059	18 2 2.4	57.46	0 44.2	27	21 7 12.51	9.346	17 16 30.0	41.30	12 48.
28	20 56 9.81	14.120	17 58 11.6	57.87	0 29.4	31	21 6 34.81	9.494	17 19 16.0	41.65	12 32
Feb. 1	20 57 6.34	14.137	17 54 19.6	58.11	0 14.6	Aug. 4	21 5 56.64	9.582	17 22 2.9	41.76	12 16.
5	20 58 2.85	14.110	17 50 27.1	58.15	23 56.1	8	21 5 18.24	9.606	17 24 49.7	41.57	11 59
9	20 58 59.16	+14.037	−17 46 34.8	+57.98	23 41.4	12	21 4 39.88	− 9.563	−17 27 35.1	−41.09	11 43.
13	20 59 55.08	13.912	17 42 43.5	57.62	23 26.5	16	21 4 1.82	9.456	17 30 18.0	40.33	11 26.
17	21 0 50.39	13.738	17 38 54.0	57.05	23 11.7	20	21 3 24.32	9.284	17 32 57.4	39.29	11 10.
21	21 1 44.92	13.515	17 35 7.4	56.27	22 56.9	24	21 2 47.63	9.051	17 35 32.0	38.02	10 54.
25	21 2 38.46	13.249	17 31 24.2	55.28	22 42.0	28	21 2 11.99	8.761	17 38 1.2	36.53	10 37.
Mar. 1	21 3 30.86	+12.944	−17 27 45.4	+54.08	22 27.1	Sept. 1	21 1 37.62	− 8.415	−17 40 24.0	−34.81	10 21.
5	21 4 21.96	12.601	17 24 11.7	52.73	22 12.3	5	21 1 4.75	8.011	17 42 39.4	32.86	10 5.
9	21 5 11.61	12.216	17 20 43.8	51.18	21 57.4	9	21 0 33.61	7.549	17 44 46.6	30.70	9 49.
13	21 5 59.63	11.787	17 17 22.5	49.43	21 42.5	13	21 0 4.43	7.032	17 46 44.7	28.32	9 32.
17	21 6 45.85	11.316	17 14 8.6	47.48	21 27.5	17	20 59 37.42	6.466	17 48 32.9	25.75	9 16
21	21 7 30.11	+10.807	−17 11 2.9	+45.34	21 12.5	21	20 59 12.76	− 5.858	−17 50 10.5	−23.05	9 0.
25	21 8 12.26	10.263	17 8 6.1	43.04	20 57.5	25	20 58 50.61	5.213	17 51 37.1	20.22	8 44.
29	21 8 52.17	9.690	17 5 18.8	40.58	20 42.4	29	20 58 31.10	4.532	17 52 52.1	17.36	8 28.
Apr. 2	21 9 29.73	9.090	17 2 41.6	37.97	20 27.3	Oct. 3	20 58 14.39	3.816	17 53 55.0	14.18	8 12.
6	21 10 4.84	8.460	17 0 15.2	35.22	20 12.1	7	20 58 0.61	3.068	17 54 45.4	10.99	7 56.5
10	21 10 37.37	+ 7.797	−16 58 0.0	+32.34	19 56.9	11	20 57 49.88	− 2.295	−17 55 22.8	− 7.70	7 40.6
14	21 11 7.18	7.105	16 55 56.7	29.30	19 41.7	15	20 57 42.28	1.501	17 55 46.9	4.36	7 24.7
18	21 11 34.18	6.392	16 54 5.8	26.14	19 26.4	19	20 57 37.89	− 0.693	17 55 57.6	− 0.98	7 8.9
22	21 11 58.29	5.661	16 52 27.7	22.90	19 11.1	23	20 57 36.74	+ 0.122	17 55 54.7	+ 2.42	6 53.
26	21 12 19.45	4.916	16 51 2.7	19.57	18 55.7	27	20 57 38.87	0.942	17 55 38.2	5.83	6 37
30	21 12 37.60	+ 4.158	−16 49 51.2	+16.18	18 40.2	31	20 57 44.28	+ 1.765	−17 55 8.0	+ 9.26	6 21.
May 4	21 12 52.70	3.388	16 48 53.3	12.74	18 24.7	Nov. 4	20 57 52.99	2.590	17 54 24.1	12.68	6 6.
8	21 13 4.69	2.608	16 48 9.3	9.25	18 9.2	8	20 58 5.00	3.413	17 53 26.6	16.08	5 50.8
12	21 13 13.55	1.820	16 47 39.3	5.73	17 53.6	12	20 58 20.28	4.224	17 52 15.5	19.46	5 35.3
16	21 13 19.24	1.028	16 47 23.5	+ 2.19	17 38.0	16	20 58 38.77	5.018	17 50 51.0	22.77	5 19.9
20	21 13 21.77	+ 0.238	−16 47 21.8	− 1.33	17 22.3	20	20 59 0.40	+ 5.792	−17 49 13.5	+25.98	5 4.5
24	21 13 21.15	− 0.545	16 47 34.1	4.81	17 6.5	24	20 59 25.08	6.543	17 47 23.4	29.11	4 49.
28	21 13 17.42	1.316	16 48 0.2	8.22	16 50.7	28	20 59 52.72	7.274	17 45 20.9	32.16	4 33.9
June 1	21 13 10.64	2.072	16 48 39.7	11.56	16 34.9	Dec. 2	21 0 23.24	7.983	17 43 6.2	35.14	4 18.7
5	21 13 0.86	2.818	16 49 32.5	14.83	16 19.0	6	21 0 56.54	8.662	17 40 39.8	38.02	4 3.5
9	21 12 48.12	− 3.548	−16 50 38.3	−18.01	16 3.0	10	21 1 32.48	+ 9.305	−17 38 2.2	+40.77	3 48.4
13	21 12 32.51	4.251	16 51 56.5	21.05	15 47.0	14	21 2 10.93	9.912	17 35 13.8	43.38	3 33.3
17	21 12 14.15	4.925	16 53 26.5	23.94	15 31.0	18	21 2 51.73	10.478	17 32 15.3	45.84	3 18.3
21	21 11 53.16	5.566	16 55 7.8	26.66	15 14.9	22	21 3 34.71	11.005	17 29 7.3	48.14	3 3.3
25	21 11 29.67	6.172	16 56 59.5	29.18	14 58.8	26	21 4 19.72	11.495	17 25 50.4	50.30	2 48.3
29	21 11 3.84	− 6.737	−16 59 1.0	−31.52	14 42.6	30	21 5 6.62	+11.948	−17 22 25.2	+52.32	2 33.3
July 3	21 10 35.83	− 7.262	−17 1 11.4	−33.66	14 26.4	34	21 5 55.25	+12.356	−17 18 52.1	+54.18	2 18.4

Least semidiameter,	February 2, 1″.61	Least horizontal parallax,	February 2, 0″.42
Greatest semidiameter,	August 6, 1″.77	Greatest horizontal parallax,	August 6, 0″.47

NEPTUNE, 1915.

GREENWICH MEAN TIME.

onth and ay.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.	Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Meridian Passage.
	Noon.	*Noon.*	*Noon.*	*Noon.*			*Noon.*	*Noon.*	*Noon.*	*Noon.*	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
n. 0	8 6 45.63	−6.477	+19 52 26.8	+19.94	13 28.2	July 3	8 6 0.83	+8.861	+19 58 5.2	−25.70	1 24.1
4	8 6 19.29	6.682	19 53 47.8	20.55	13 12.0	7	8 6 36.57	9.005	19 56 21.2	26.30	1 8.9
8	8 5 52.22	6.846	19 55 10.9	21.02	12 55.9	11	8 7 12.83	9.118	19 54 35.0	26.81	0 53.8
12	8 5 24.58	6.965	19 56 35.7	21.36	12 39.7	15	8 7 49.47	9.197	19 52 46.9	27.22	0 38.7
16	8 4 56.57	7.034	19 58 1.6	21.56	12 23.5	19	8 8 26.37	9.246	19 50 57.4	27.53	0 23.6
20	8 4 28.38	−7.055	+19 59 28.0	+21.61	12 7.3	23	8 9 3.39	+9.261	+19 49 6.8	−27.75	0 8.5
24	8 4 0.19	7.030	20 0 54.3	21.51	11 51.1	27	8 9 40.41	9.246	19 47 15.6	27.88	23 49.6
28	8 3 32.20	6.960	20 2 19.9	21.29	11 34.9	31	8 10 17.32	9.203	19 45 24.0	27.91	23 34.5
eb. 1	8 3 4.57	6.845	20 3 44.4	20.94	11 18.7	Aug. 4	8 10 53.99	9.130	19 43 32.4	27.86	23 19.4
5	8 2 37.50	6.687	20 5 7.3	20.47	11 2.6	8	8 11 30.31	9.024	19 41 41.3	27.71	23 4.2
9	8 2 11.13	−6.487	+20 6 28.0	+19.86	10 46.4	12	8 12 6.14	+8.886	+19 39 51.0	−27.43	22 49.1
13	8 1 45.65	6.243	20 7 46.0	19.14	10 30.2	16	8 12 41.36	8.715	19 38 2.0	27.06	22 33.9
17	8 1 21.24	5.957	20 9 0.9	18.31	10 14.1	20	8 13 15.83	8.514	19 36 14.7	26.57	22 18.8
21	8 0 58.05	5.631	20 10 12.2	17.36	9 58.0	24	8 13 49.44	8.285	19 34 29.6	25.97	22 3.6
25	8 0 36.24	5.271	20 11 19.6	16.32	9 41.9	28	8 14 22.07	8.029	19 32 47.0	25.29	21 48.4
ar. 1	8 0 15.93	−4.880	+20 12 22.7	+15.19	9 25.9	Sept. 1	8 14 53.64	+7.747	+19 31 7.4	−24.53	21 33.2
5	7 59 57.24	4.460	20 13 21.0	13.98	9 9.8	5	8 15 24.01	7.434	19 29 31.0	23.66	21 18.0
9	7 59 40.29	4.013	20 14 14.4	12.72	8 53.8	9	8 15 53.07	7.092	19 27 58.3	22.67	21 2.7
13	7 59 25.17	3.540	20 15 2.6	11.38	8 37.8	13	8 16 20.70	6.721	19 26 29.8	21.58	20 47.4
17	7 59 12.00	3.041	20 15 45.3	9.96	8 21.9	17	8 16 46.81	6.326	19 25 5.8	20.38	20 32.1
21	7 59 0.86	−2.524	+20 16 22.3	+ 8.50	8 6.0	21	8 17 11.29	+5.909	+19 23 46.8	−19.10	20 16.8
25	7 58 51.82	1.994	20 16 53.3	7.01	7 50.1	25	8 17 34.06	5.473	19 22 33.1	17.77	20 1.5
29	7 58 44.93	1.453	20 17 18.3	5.49	7 34.3	29	8 17 55.05	5.016	19 21 24.8	16.35	19 46.1
pr. 2	7 58 40.21	0.905	20 17 37.2	3.94	7 18.5	Oct. 3	8 18 14.16	4.536	19 20 22.5	14.84	19 30.6
6	7 58 37.70	−0.350	20 17 49.8	2.37	7 2.7	7	8 18 31.31	4.037	19 19 26.3	13.23	19 15.2
10	7 58 37.42	+0.211	+20 17 56.1	+ 0.79	6 47.0	11	8 18 46.43	+3.519	+19 18 36.7	−11.57	18 59.7
14	7 58 39.39	0.774	20 17 56.1	− 0.80	6 31.3	15	8 18 59.45	2.988	19 17 53.9	9.84	18 44.2
18	7 58 43.60	1.335	20 17 49.7	2.39	6 15.6	19	8 19 10.32	2.447	19 17 18.1	8.08	18 28.6
22	7 58 50.06	1.890	20 17 37.0	3.98	6 0.0	23	8 19 19.02	1.900	19 16 49.3	6.28	18 13.1
26	7 58 58.72	2.435	20 17 17.9	5.55	5 44.4	27	8 19 25.52	1.344	19 16 27.9	4.45	17 57.4
30	7 59 9.53	+2.970	+20 16 52.6	− 7.09	5 28.9	31	8 19 29.78	+0.782	+19 16 13.7	− 2.60	17 41.8
ay 4	7 59 22.46	3.494	20 16 21.2	8.60	5 13.4	Nov. 4	8 19 31.77	+0.214	19 16 7.1	− 0.71	17 26.1
8	7 59 37.46	4.006	20 15 43.8	10.09	4 57.9	8	8 19 31.50	−0.353	19 16 8.1	+ 1.18	17 10.3
12	7 59 54.49	4.504	20 15 0.5	11.57	4 42.4	12	8 19 28.96	0.911	19 16 16.5	3.05	16 54.6
16	8 0 13.47	4.984	20 14 11.3	13.01	4 27.0	16	8 19 24.21	1.463	19 16 32.4	4.88	16 38.7
20	8 0 34.33	+5.443	+20 13 16.5	−14.40	4 11.7	20	8 19 17.27	−2.005	+19 16 55.5	+ 6.68	16 22.9
24	8 0 56.98	5.879	20 12 16.2	15.72	3 56.3	24	8 19 8.19	2.535	19 17 25.7	8.45	16 7.0
28	8 1 21.33	6.292	20 11 10.8	16.99	3 41.0	28	8 18 57.01	3.051	19 18 3.0	10.17	15 51.1
June 1	8 1 47.28	6.682	20 10 0.3	18.22	3 25.7	Dec. 2	8 18 43.81	3.548	19 18 47.0	11.81	15 35.1
5	8 2 14.76	7.051	20 8 45.1	19.40	3 10.4	6	8 18 28.66	4.023	19 19 37.4	13.39	15 19.2
9	8 2 43.66	+7.395	+20 7 25.2	−20.52	2 55.2	10	8 18 11.66	−4.473	+19 20 34.0	+14.88	15 3.1
13	8 3 13.89	7.713	20 6 1.0	21.58	2 39.9	14	8 17 52.92	4.891	19 21 36.2	16.24	14 47.1
17	8 3 45.33	8.002	20 4 32.7	22.56	2 24.7	18	8 17 32.57	5.278	19 22 43.8	17.50	14 31.0
21	8 4 17.86	8.259	20 3 0.7	23.46	2 9.6	22	8 17 10.74	5.632	19 23 56.1	18.65	14 14.9
25	8 4 51.36	8.487	20 1 25.2	24.28	1 54.4	26	8 16 47.57	5.948	19 25 12.8	19.68	13 58.8
29	8 5 25.72	+8.689	+19 59 46.6	−25.02	1 39.2	30	8 16 23.21	−6.229	+19 26 33.4	+20.58	13 42.7
July 3	8 6 0.83	+8.861	+19 58 5.2	−25.70	1 24.1	34	8 15 57.79	−6.471	+19 27 57.3	+21.35	13 26.5

Greatest semidiameter,	January 19.	1″.33	Greatest horizontal parallax,	January 19.	0″.30
Least semidiameter,	July 23.	1″.25	Least horizontal parallax,	July 23.	0″.28

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fro Earth—	
							At Date.	At Interm diate Date
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 1	272 18 49.5	2 48 49.6	+12 52.3	−4 57 48.5	−14 33.3	9.664 4806	0.158 6808	0.158 59
2	275 8 21.0	2 50 15.5	12 48.3	5 12 3.2	13 55.7	9.662 8071	0.158 4642	0.158 291
3	277 59 25.0	2 51 54.6	12 36.7	5 25 39.2	13 16.0	9.660 8699	0.158 0757	0.157 816
4	280 52 14.8	2 53 47.4	12 17.4	5 38 34.3	12 33.8	9.658 6679	0.157 5128	0.157 16
5	283 47 4.4	2 55 54.1	11 50.3	5 50 45.8	11 48.9	9.656 2001	0.156 7721	0.156 333
6	286 44 7.8	2 58 15.2	+11 15.4	−6 2 11.0	−11 1.1	9.653 4657	0.155 8497	0.155 319
7	289 43 39.8	3 0 51.2	10 32.8	6 12 47.0	10 10.2	9.650 4638	0.154 7411	0.154 115
8	292 45 55.5	3 3 42.7	9 42.5	6 22 30.4	9 15.8	9.647 1935	0.153 4411	0.152 717
9	295 51 10.7	3 6 50.3	8 44.7	6 31 17.4	8 17.5	9.643 6545	0.151 9434	0.151 118
10	298 59 41.8	3 10 14.6	7 39.7	6 39 4.0	7 15.0	9.639 8467	0.150 2411	0.149 311
11	302 11 45.8	3 13 56.3	+ 6 27.9	−6 45 45.9	− 6 7.9	9.635 7705	0.148 3270	0.147 287
12	305 27 40.4	3 17 56.0	5 9.7	6 51 18.1	4 55.7	9.631 4272	0.146 1918	0.145 038
13	308 47 44.0	3 22 14.4	3 45.7	6 55 35.4	3 37.9	9.626 8183	0.143 8261	0.142 553
14	312 12 15.6	3 26 52.2	2 16.8	6 58 31.9	2 14.0	9.621 9473	0.141 2199	0.139 822
15	315 41 35.1	3 31 50.1	+ 0 43.8	7 0 1.3	− 0 43.7	9.616 8181	0.138 3611	0.136 833
16	319 16 2.9	3 37 9.0	− 0 52.2	−6 59 57.0	+ 0 53.5	9.611 4367	0.135 2372	0.133 571
17	322 56 0.3	3 42 49.4	2 29.7	6 58 11.8	2 38.2	9.605 8107	0.131 8342	0.130 023
18	326 41 49.0	3 48 51.7	4 7.3	6 54 38.0	4 30.7	9.599 9502	0.128 1371	0.126 173
19	330 33 51.1	3 55 16.3	5 43.2	6 49 7.6	6 31.5	9.593 8680	0.124 1295	0.122 003
20	334 32 29.0	4 2 3.4	7 15.3	6 41 32.1	8 40.9	9.587 5798	0.119 7939	0.117 497
21	338 38 5.4	4 9 13.1	− 8 41.5	−6 31 42.9	+10 58.9	9.581 1055	0.115 1113	0.112 633
22	342 51 2.5	4 16 44.8	9 59.2	6 19 31.4	13 25.5	9.574 4691	0.110 0617	0.107 392
23	347 11 42.0	4 24 37.8	11 5.8	6 4 49.1	16 0.5	9.567 6996	0.104 6237	0.101 752
24	351 40 24.8	4 32 50.9	11 58.6	5 47 27.9	18 43.1	9.560 8313	0.098 7747	0.095 689
25	356 17 29.8	4 41 22.0	12 34.7	5 27 20.6	21 32.4	9.553 9048	0.092 4921	0.089 180
26	1 3 13.9	4 50 8.5	−12 51.4	−5 4 21.4	+24 26.6	9.546 9674	0.085 7522	0.082 203
27	5 57 50.9	4 59 7.0	12 46.4	4 38 26.3	27 23.8	9.540 0737	0.078 5314	0.074 733
28	11 1 30.5	5 8 13.0	12 17.8	4 9 33.7	30 21.2	9.533 2852	0.070 8070	0.066 740
29	16 14 17.7	5 17 21.0	11 24.2	3 37 45.1	33 15.1	9.526 6707	0.062 5574	0.058 229
30	21 36 11.1	5 26 24.4	10 5.3	3 3 6.1	36 1.2	9.520 3060	0.053 7633	0.049 157
31	27 7 2.3	5 35 15.3	− 8 22.1	−2 25 46.9	+38 34.7	9.514 2724	0.044 4094	0.039 519
Feb. 1	32 46 34.5	5 43 44.9	6 16.8	1 46 2.8	40 50.0	9.508 6556	0.034 4854	0.029 308
2	38 34 21.7	5 51 43.5	3 53.1	1 4 14.9	42 41.2	9.503 5433	0.023 9872	0.018 523
3	44 29 47.7	5 59 0.7	− 1 16.4	−0 20 50.2	44 2.7	9.499 0229	0.012 9197	0.007 176
4	50 32 5.7	6 5 25.8	+ 1 26.7	+0 23 38.8	44 49.0	9.495 1773	0.001 2983	9.995 288
5	56 40 18.4	6 10 48.3	+ 4 8.4	+1 8 34.6	+44 55.6	9.492 0820	9.989 1509	9.982 892
6	62 53 18.3	6 14 58.6	6 40.5	1 53 15.8	44 19.5	9.489 8012	9.976 5200	9.970 041
7	69 9 49.0	6 17 48.6	8 54.8	2 36 58.9	42 59.4	9.488 3840	9.963 4646	9.956 801
8	75 28 26.8	6 19 12.0	10 43.8	3 19 0.2	40 56.1	9.487 8619	9.950 0616	9.943 259
9	81 47 43.1	6 19 5.1	12 1.7	3 58 37.6	38 12.4	9.488 2467	9.936 4072	9.929 520
10	88 6 6.9	6 17 27.3	+12 44.4	+4 35 13.1	+34 53.2	9.489 5296	9.922 6162	9.915 710
11	94 22 8.1	6 14 20.7	12 50.1	5 8 14.3	31 5.1	9.491 6822	9.908 8231	9.901 972
12	100 34 20.2	6 9 50.3	12 19.7	5 37 16.0	26 55.4	9.494 6578	9.895 1799	9.888 465
13	106 41 23.1	6 4 3.7	11 16.0	6 2 0.6	22 32.2	9.498 3943	9.881 8525	9.875 362
14	112 42 5.4	5 57 10.7	9 43.6	6 22 18.5	18 3.4	9.502 8177	9.869 0182	9.862 843
15	118 35 26.0	5 49 22.2	+ 7 48.4	+6 38 7.8	+13 36.1	9.507 8458	9.856 8597	9.851 000
16	124 20 35.1	5 40 49.6	+ 5 37.0	+6 49 33.1	+ 9 16.4	9.513 3918	9.845 5587	9.840 284

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
eb. 15	118 35 26.0	5 49 22.2	+ 7 48.4	+6 38 7.8	+13 36.1	9.507 8458	9.856 8597	9.851 0909
16	124 20 35.1	5 40 49.6	5 37.0	6 49 33.1	9 16.4	9.513 3918	9.845 5587	9.840 2844
17	129 56 54.4	5 31 44.5	3 16.0	6 56 44.7	5 9.4	9.519 3678	9.835 2881	9.830 5888
18	135 23 57.0	5 22 18.0	+ 0 51.7	6 59 57.3	+ 1 18.7	9.525 6877	9.826 2038	9.822 1487
19	140 41 26.6	5 12 40.1	− 1 30.2	6 59 28.3	− 2 13.3	9.532 2693	9.818 4372	9.815 0808
20	145 49 16.2	5 2 59.6	− 3 44.9	+6 55 37.4	− 5 25.1	9.539 0361	9.812 0886	9.809 4673
21	150 47 27.2	4 53 24.0	5 48.6	6 48 44.9	8 16.4	9.545 9181	9.807 2211	9.805 3517
22	155 36 7.7	4 43 59.5	7 38.6	6 39 11.2	10 47.6	9.552 8524	9.803 8584	9.802 7381
23	160 15 31.4	4 34 51.0	9 12.8	6 27 16.1	12 59.4	9.559 7837	9.801 9853	9.801 5923
24	164 45 56.3	4 26 2.3	10 30.3	6 13 18.5	14 52.9	9.566 6636	9.801 5497	9.801 8463
25	169 7 43.4	4 17 36.0	−11 30.6	+5 57 35.8	−16 29.7	9.573 4505	9.802 4693	9.803 4048
26	173 21 16.3	4 9 34.0	12 13.9	5 40 24.1	17 51.3	9.580 1091	9.804 6377	9.806 1522
27	177 26 59.8	4 1 57.3	12 40.7	5 21 57.7	18 59.2	9.586 6097	9.807 9318	9.809 9598
28	181 25 19.6	3 54 46.5	12 51.8	5 2 29.8	19 54.9	9.592 9274	9.812 2192	9.814 6930
ar. 1	185 16 41.5	3 48 1.5	12 48.5	4 42 11.7	20 39.7	9.599 0420	9.817 3647	9.820 2177
2	189 1 31.3	3 41 42.2	−12 31.9	+4 21 13.6	−21 15.0	9.604 9371	9.823 2358	9.826 4039
3	192 40 14.4	3 35 48.0	12 3.4	3 59 44.5	21 42.0	9.610 5994	9.829 7072	9.833 1314
4	196 13 15.6	3 30 18.2	11 24.4	3 37 52.0	22 1.8	9.616 0185	9.836 6631	9.840 2895
5	199 40 58.8	3 25 11.9	10 36.2	3 15 42.9	22 15.4	9.621 1864	9.843 9988	9.847 7796
6	203 3 47.0	3 20 28.2	9 40.1	2 53 23.0	22 23.6	9.626 0969	9.851 6214	9.855 5146
7	206 22 2.5	3 16 6.3	− 8 37.4	+2 30 57.2	−22 27.1	9.630 7456	9.859 4502	9.863 4200
8	209 36 6.5	3 12 5.0	7 29.3	2 8 30.0	22 26.6	9.635 1293	9.867 4164	9.871 4322
9	212 46 19.1	3 8 23.5	6 16.9	1 46 5.1	22 22.6	9.639 2460	9.875 4610	9.879 4970
10	215 52 59.8	3 5 0.9	5 1.4	1 23 45.7	22 15.7	9.643 0945	9.883 5348	9.887 5696
11	218 56 27.0	3 1 56.4	3 43.6	1 1 34.5	22 6.2	9.646 6743	9.891 5971	9.895 6134
12	221 56 58.5	2 59 9.2	− 2 24.6	+0 39 34.0	−21 54.4	9.649 9854	9.899 6150	9.903 5987
13	224 54 51.1	2 56 38.6	− 1 5.2	+0 17 46.3	21 40.6	9.653 0280	9.907 5618	9.911 5018
14	227 50 20.9	2 54 23.8	+ 0 13.9	−0 3 46.9	21 25.2	9.655 8029	9.915 4164	9.919 3036
15	230 43 43.6	2 52 24.2	1 31.9	0 25 3.8	21 8.3	9.658 3110	9.923 1618	9.926 9895
16	233 35 14.1	2 50 39.2	2 48.1	0 46 3.1	20 50.0	9.660 5532	9.930 7855	9.934 5486
17	236 25 6.7	2 49 8.3	+ 4 1.9	−1 6 43.5	−20 30.5	9.662 5305	9.938 2781	9.941 9730
18	239 13 35.3	2 47 51.2	5 12.7	1 27 3.7	20 9.8	9.664 2439	9.945 6327	9.949 2567
19	242 0 53.6	2 46 47.4	6 20.1	1 47 2.7	19 48.0	9.665 6944	9.952 8446	9.956 3962
20	244 47 14.6	2 45 56.7	7 23.5	2 6 39.4	19 25.1	9.666 8829	9.959 9111	9.963 3892
21	247 32 51.3	2 45 18.7	8 22.4	2 25 52.7	19 1.2	9.667 8099	9.966 8305	9.970 2350
22	250 17 56.2	2 44 53.2	+ 9 16.5	−2 44 41.5	−18 36.3	9.668 4761	9.973 6027	9.976 9337
23	253 2 41.9	2 44 40.0	10 5.3	3 3 4.9	18 10.3	9.668 8821	9.980 2282	9.983 4863
24	255 47 20.5	2 44 39.1	10 48.5	3 21 1.8	17 43.2	9.669 0280	9.986 7082	9.989 8941
25	258 32 4.3	2 44 50.5	11 25.7	3 38 31.0	17 15.0	9.668 9139	9.993 0444	9.996 1592
26	261 17 5.6	2 45 14.1	11 56.7	3 55 31.3	16 45.4	9.668 5397	9.999 2389	0.002 2837
27	264 2 36.6	2 45 49.9	+12 21.0	−4 12 1.3	−16 14.4	9.667 9053	0.005 2940	0.008 2699
28	266 48 49.5	2 46 38.0	12 38.6	4 27 59.7	15 42.1	9.667 0101	0.011 2118	0.014 1202
29	269 35 56.8	2 47 38.6	12 49.1	4 43 24.9	15 8.1	9.665 8536	0.016 9952	0.019 8370
30	272 24 11.0	2 48 52.0	12 52.3	4 58 15.3	14 32.3	9.664 4352	0.022 6460	0.025 4226
31	275 13 45.1	2 50 18.3	12 48.0	5 12 28.9	13 54.5	9.662 7540	0.028 1668	0.030 8790
Apr. 1	278 4 52.0	2 51 57.8	+12 36.2	−5 26 3.7	−13 14.6	9.660 8091	0.033 5594	0.036 2081
2	280 57 45.2	2 53 50.9	+12 16.7	−5 38 57.4	−12 32.3	9.658 5993	0.038 8253	0.041 411[illegible]

MERCURY.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fro Earth—	
								At Date.	At Interme diate Date
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr.	1	278 4 52.0	2 51 57.8	+12 36.2	−5 26 3.7	−13 14.6	9.660 8091	0.033 5594	0.036 20
	2	280 57 45.2	2 53 50.9	12 16.7	5 38 57.4	12 32.3	9.658 5993	0.038 8253	0.041 41
	3	283 52 38.5	2 55 58.0	11 49.3	5 51 7.5	11 47.4	9.656 1237	0.043 9661	0.046 48
	4	286 49 46.1	2 58 19.6	11 14.2	6 2 31.3	10 59.6	9.653 3814	0.048 9826	0.051 44
	5	289 49 22.7	3 0 56.1	10 31.3	6 13 5.7	10 8.6	9.650 3714	0.053 8756	0.056 27
	6	292 51 43.4	3 3 48.1	+ 9 40.8	−6 22 47.4	− 9 14.1	9.647 0931	0.058 6452	0.060 98
	7	295 57 4.1	3 6 56.2	8 42.8	6 31 32.6	8 15.7	9.643 5462	0.063 2911	0.065 56
	8	299 5 41.3	3 10 21.0	7 37.6	6 39 17.3	7 13.0	9.639 7306	0.067 8125	0.070 02
	9	302 17 51.9	3 14 3.1	6 25.6	6 45 57.1	6 5.7	9.635 6466	0.072 2079	0.074 35
	10	305 33 53.5	3 18 3.2	5 7.2	6 51 27.1	4 53.3	9.631 2953	0.076 4753	0.078 56
	11	308 54 4.6	3 22 22.2	+ 3 43.1	−6 55 41.9	− 3 35.3	9.626 6788	0.080 6121	0.082 63
	12	312 18 44.4	3 27 0.7	2 14.0	6 58 35.8	2 11.4	9.621 8001	0.084 6148	0.086 50
	13	315 48 12.7	3 31 59.3	+ 0 40.9	7 0 2.6	− 0 41.0	9.616 6634	0.088 4790	0.090 35
	14	319 22 50.0	3 37 18.8	− 0 55.1	6 59 55.4	+ 0 56.5	9.611 2745	0.092 1996	0.094 00
	15	323 2 57.4	3 42 59.8	2 32.7	6 58 7.0	2 41.5	9.605 6413	0.095 7703	0.097 49
	16	326 48 56.8	3 49 2.7	− 4 10.3	−6 54 29.8	+ 4 34.3	9.599 7740	0.099 1837	0.100 82
	17	330 41 10.2	3 55 27.9	5 46.1	6 48 55.7	6 35.4	9.593 6854	0.102 4318	0.103 99
	18	334 40 0.1	4 2 15.7	7 18.1	6 41 16.3	8 45.0	9.587 3914	0.105 5048	0.106 97
	19	338 45 49.1	4 9 26.0	8 44.0	6 31 22.9	11 3.2	9.580 9119	0.108 3917	0.109 76
	20	342 58 59.5	4 16 58.4	10 1.4	6 19 7.0	13 30.0	9.574 2712	0.111 0803	0.112 34
	21	347 19 53.0	4 24 52.1	−11 7.6	−6 4 20.0	+16 5.3	9.567 4982	0.113 5569	0.114 71
	22	351 48 50.3	4 33 5.7	11 59.9	5 46 53.9	18 48.2	9.560 6275	0.115 8062	0.116 84
	23	356 26 10.4	4 41 37.3	12 35.5	5 26 41.5	21 37.6	9.553 6999	0.117 8115	0.118 71
	24	1 12 10.0	4 50 24.2	12 51.6	5 3 37.1	24 31.9	9.546 7630	0.119 5548	0.120 32
	25	6 7 2.9	4 59 23.0	12 45.9	4 37 36.7	27 29.2	9.539 8714	0.121 0167	0.121 63
	26	11 10 58.7	5 8 29.2	−12 16.5	−4 8 38.7	+30 26.5	9.533 0868	0.122 1763	0.122 63
	27	16 24 2.0	5 17 37.2	11 22.2	3 36 44.9	33 20.2	9.526 4784	0.123 0119	0.123 301
	28	21 46 11.5	5 26 40.3	10 2.6	3 2 1.0	36 6.1	9.520 1221	0.123 5007	0.123 60
	29	27 17 18.4	5 35 30.7	8 18.7	2 24 37.2	38 39.1	9.514 0994	0.123 6197	0.123 53
	30	32 57 5.7	5 43 59.5	6 12.7	1 44 49.0	40 53.7	9.508 4961	0.123 3462	0.123 05
May	1	38 45 7.0	5 51 57.1	− 3 48.6	−1 2 57.8	+42 44.1	9.503 4000	0.122 6583	0.122 15
	2	44 40 46.0	5 59 12.9	− 1 11.6	−0 19 30.7	44 4.6	9.498 8982	0.121 5347	0.120 80
	3	50 43 15.5	6 5 36.3	+ 1 31.6	+0 24 59.7	44 49.7	9.495 0735	0.119 9569	0.118 90
	4	56 51 37.8	6 10 56.9	4 13.2	1 9 55.6	44 55.1	9.492 0013	0.117 9092	0.116 70
	5	63 4 45.2	6 15 5.1	6 44.8	1 54 35.7	44 17.7	9.489 7453	0.115 3790	0.113 930
	6	69 21 21.1	6 17 52.6	+ 8 58.5	+2 38 16.4	+42 56.3	9.488 3542	0.112 3579	0.110 66
	7	75 40 1.5	6 19 13.4	10 46.7	3 20 13.9	40 51.8	9.487 8588	0.108 8423	0.106 809
	8	81 59 17.7	6 19 3.8	12 3.5	3 59 46.4	38 7.0	9.488 2703	0.104 8333	0.102 645
	9	88 17 38.7	6 17 23.2	12 45.1	4 36 16.0	34 46.8	9.489 5794	0.100 3369	0.097 909
	10	94 33 34.5	6 14 14.0	12 49.7	5 9 10.4	30 57.7	9.491 7572	0.095 3640	0.092 703
	11	100 45 38.7	6 9 41.1	+12 18.3	+5 38 4.5	+26 47.5	9.494 7563	0.089 9293	0.087 04
	12	106 52 31.4	6 3 52.4	11 13.6	6 2 41.1	22 24.2	9.498 5142	0.084 0509	0.080 95
	13	112 53 1.6	5 56 57.7	9 40.5	6 22 51.0	17 55.4	9.502 9566	0.077 7507	0.074 449
	14	118 46 8.5	5 49 7.8	7 44.7	6 38 32.3	13 28.1	9.508 0012	0.071 0526	0.067 56
	15	124 31 2.5	5 40 34.1	5 32.8	6 49 49.8	9 8.7	9.513 5613	0.063 9815	0.060 314
	16	130 7 5.8	5 31 28.2	+ 3 11.6	+6 56 54.0	+ 5 2.2	9.519 5488	0.056 5636	0.052 73
	17	135 33 51.8	5 22 1.2	+ 0 47.3	+6 59 59.6	+ 1 12.0	9.525 8777	0.048 8253	0.044 84

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
ay 16	130 7 5.8	5 31 28.2	+ 3 11.6	+6 56 54.0	+ 5 2.2	9.519 5488	0.056 5636	0.052 7329
17	135 33 51.8	5 22 1.2	+ 0 47.3	6 59 59.6	+ 1 12.0	9.525 8777	0.048 8253	0.044 8440
18	140 51 4.4	5 12 23.0	− 1 34.4	6 59 24.2	− 2 19.4	9.532 4660	0.040 7923	0.036 6733
19	145 58 37.0	5 2 42.5	3 48.8	6 55 27.5	5 30.6	9.539 2373	0.032 4901	0.028 2458
20	150 56 31.0	4 53 7.1	5 52.2	6 48 29.8	8 21.3	9.546 1218	0.023 9433	0.019 5855
21	155 44 54.9	4 43 43.0	− 7 41.7	+6 38 51.5	−10 51.8	9.553 0570	0.015 1753	0.010 7154
22	160 24 2.4	4 34 35.1	9 15.5	6 26 52.5	13 3.0	9.559 9875	0.006 2086	0.001 6574
23	164 54 11.6	4 25 47.0	10 32.4	6 12 51.4	14 56.1	9.566 8653	9.997 0644	9.992 4321
24	169 15 43.8	4 17 21.4	11 32.2	5 57 5.7	16 32.5	9.573 6490	9.987 7630	9.983 0595
25	173 29 2.5	4 9 20.2	12 14.9	5 39 51.4	17 53.6	9.580 3033	9.978 3239	9.973 5586
26	177 34 32.5	4 1 44.3	−12 41.2	+5 21 23.0	−19 1.1	9.586 7988	9.968 7658	9.963 9477
27	181 32 39.6	3 54 34.2	12 51.9	5 1 53.3	19 56.4	9.593 1109	9.959 1066	9.954 2447
28	185 23 49.5	3 47 49.9	12 48.2	4 41 33.8	20 40.9	9.599 2193	9.949 3642	9.944 4672
29	189 8 28.0	3 41 31.4	12 31.2	4 20 34.7	21 16.0	9.605 1077	9.939 5560	9.934 6329
30	192 47 0.7	3 35 38.0	12 2.4	3 59 4.7	21 42.8	9.610 7630	9.929 7001	9.924 7597
31	196 19 52.1	3 30 8.8	−11 23.1	+3 37 11.5	−22 2.4	9.616 1748	9.919 8140	9.914 8654
une 1	199 47 26.2	3 25 3.2	10 34.6	3 15 2.0	22 15.8	9.621 3351	9.909 9162	9.904 9689
2	203 10 6.1	3 20 20.2	9 38.3	2 52 41.8	22 23.8	9.626 2380	9.900 0260	9.895 0900
3	206 28 13.8	3 15 58.8	8 35.4	2 30 15.9	22 27.2	9.630 8789	9.890 1637	9.885 2497
4	209 42 10.6	3 11 58.1	7 27.1	2 7 48.7	22 26.6	9.635 2548	9.880 3509	9.875 4702
5	212 52 16.6	3 8 17.2	− 6 14.6	+1 45 23.9	−22 22.6	9.639 3637	9.870 6108	9.865 7758
6	215 58 51.3	3 4 55.2	4 59.0	1 23 4.6	22 15.5	9.643 2043	9.860 9684	9.856 1922
7	219 2 13.1	3 1 51.3	3 41.2	1 0 53.7	22 5.9	9.646 7762	9.851 4509	9.846 7482
8	222 2 39.6	2 59 4.6	2 22.2	0 38 53.5	21 54.1	9.650 0794	9.842 0879	9.837 4741
9	225 0 27.7	2 56 34.4	− 1 2.7	+0 17 6.2	21 40.3	9.653 1140	9.832 9112	9.828 4035
10	227 55 53.6	2 54 20.0	+ 0 16.3	−0 4 26.5	−21 24.8	9.655 8809	9.823 9554	9.819 5718
11	230 49 12.7	2 52 20.8	1 34.2	0 25 42.9	21 7.8	9.658 3811	9.815 2578	9.811 0183
12	233 40 40.0	2 50 36.3	2 50.4	0 46 41.7	20 49.4	9.660 6155	9.806 8587	9.802 7843
13	236 30 29.9	2 49 5.9	4 4.1	1 7 21.5	20 29.8	9.662 5850	9.798 8008	9.794 9139
14	239 18 56.3	2 47 49.2	5 14.9	1 27 41.1	20 9.1	9.664 2906	9.791 1295	9.787 4537
15	242 6 12.7	2 46 45.8	+ 6 22.1	−1 47 39.4	−19 47.3	9.665 7352	9.783 8926	9.780 4525
16	244 52 32.2	2 45 55.4	7 25.4	2 7 15.3	19 24.4	9.666 9138	9.777 1397	9.773 9607
17	247 38 7.7	2 45 17.8	8 24.2	2 26 27.9	19 0.5	9.667 8330	9.770 9218	9.768 0294
18	250 23 11.9	2 44 52.7	9 18.1	2 45 16.0	18 35.5	9.668 4914	9.765 2899	9.762 7096
19	253 7 57.2	2 44 39.9	10 6.7	3 3 38.6	18 9.4	9.668 8895	9.760 2948	9.758 0515
20	255 52 35.8	2 44 39.4	+10 49.7	−3 21 34.6	−17 42.3	9.669 0275	9.755 9859	9.754 1037
21	258 37 20.0	2 44 51.1	11 26.7	3 39 2.9	17 14.1	9.668 9057	9.752 4103	9.750 9110
22	261 22 22.0	2 45 15.0	11 57.5	3 56 2.3	16 44.5	9.668 5238	9.749 6106	9.748 5136
23	264 7 54.1	2 45 51.2	12 21.7	4 12 31.4	16 13.5	9.667 8815	9.747 6243	9.746 9464
24	266 54 8.5	2 46 39.7	12 39.0	4 28 28.8	15 41.1	9.666 9785	9.746 4831	9.746 2373
25	269 41 17.6	2 47 40.7	+12 49.3	−4 43 53.0	−15 7.0	9.665 8142	9.746 2111	9.746 4062
26	272 29 34.1	2 48 54.5	12 52.3	4 58 42.3	14 31.2	9.664 3878	9.746 8238	9.747 4644
27	275 19 10.8	2 50 21.1	12 47.8	5 12 54.7	13 53.4	9.662 6986	9.748 3279	9.749 4138
28	278 10 20.7	2 52 1.0	12 35.7	5 26 28.2	13 13.4	9.660 7455	9.750 7208	9.752 2471
29	281 3 17.3	2 53 54.6	12 15.9	5 39 20.6	12 31.0	9.658 5275	9.753 9905	9.755 9482
30	283 58 14.5	2 56 2.1	+11 48.4	−5 51 29.3	−11 46.0	9.656 0438	9.758 1167	9.760 4921
July 1	286 55 26.4	2 58 24.1	+11 13.0	−6 2 51.6	−10 58.1	9.653 2935	9.763 0703	9.765 8464

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fro Earth—	
							At Date.	At Interm diate Dat
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 1	286 55 26.4	2 58 24.1	+11 13.0	−6 2 51.6	−10 58.1	9.653 2935	9.763 0703	9.765 8
2	289 55 7.7	3 1 1.1	10 29.9	6 13 24.4	10 7.0	9.650 2756	9.768 8154	9.771 97
3	292 57 33.8	3 3 53.6	9 39.1	6 23 4.4	9 12.4	9.646 9892	9.775 3104	9.778 82
4	296 3 0.3	3 7 2.1	8 40.9	6 31 47.9	8 13.9	9.643 4341	9.782 5081	9.786 35
5	299 11 43.6	3 10 27.4	7 35.5	6 39 30.7	7 11.0	9.639 6102	9.790 3577	9.794 51
6	302 24 0.9	3 14 10.1	+ 6 23.3	−6 46 8.4	− 6 3.5	9.635 5179	9.798 8061	9.803 23
7	305 40 9.9	3 18 10.9	5 4.7	6 51 36.1	4 50.9	9.631 1585	9.807 7987	9.812 48
8	309 0 29.0	3 22 30.4	3 40.4	6 55 48.5	3 32.8	9.626 5339	9.817 2806	9.822 18
9	312 25 17.3	3 27 9.4	2 11.2	6 58 39.8	2 8.7	9.621 6473	9.827 1971	9.832 30
10	315 54 54.6	3 32 8.7	+ 0 38.0	7 0 3.8	− 0 38.0	9.616 5028	9.837 4948	9.842 77
11	319 29 41.6	3 37 28.9	− 0 58.1	−6 59 53.6	+ 0 59.7	9.611 1063	9.848 1212	9.853 54
12	323 9 59.5	3 43 10.5	2 35.7	6 58 2.0	2 44.8	9.605 4658	9.859 0261	9.864 56
13	326 56 9.9	3 49 14.0	4 13.2	6 54 21.3	4 37.8	9.599 5915	9.870 1612	9.875 80
14	330 48 35.0	3 55 40.0	5 49.0	6 48 43.5	6 39.2	9.593 4963	9.881 4801	9.887 19
15	334 47 37.4	4 2 28.6	7 20.8	6 41 0.1	8 49.1	9.587 1963	9.892 9385	9.898 70
16	338 53 39.6	4 9 39.5	− 8 46.5	−6 31 2.5	+11 7.6	9.580 7115	9.904 4940	9.910 29
17	343 7 3.8	4 17 12.5	10 3.6	6 18 42.0	13 34.7	9.574 0661	9.916 1057	9.921 9
18	347 28 11.7	4 25 6.8	11 9.5	6 3 50.2	16 10.2	9.567 2895	9.927 7341	9.933 54
19	351 57 24.1	4 33 21.0	12 1.3	5 46 19.1	18 53.2	9.560 4164	9.939 3411	9.945 12
20	356 34 59.8	4 41 53.2	12 36.3	5 26 1.6	21 42.8	9.553 4877	9.950 8892	9.956 62
21	1 21 15.5	4 50 40.7	−12 51.8	−5 2 51.9	+24 37.4	9.546 5512	9.962 3414	9.968 0
22	6 16 24.8	4 59 39.8	12 45.4	4 36 46.0	27 34.7	9.539 6618	9.973 6613	9.979 26
23	11 20 37.3	5 8 46.0	12 15.2	4 7 42.6	30 31.9	9.532 8815	9.984 8124	9.990 31
24	16 33 57.4	5 17 53.8	11 20.1	3 35 43.5	33 25.4	9.526 2797	9.995 7586	0.001 14
25	21 56 23.4	5 26 56.7	9 59.7	3 0 54.4	36 10.9	9.519 9323	0.006 4639	0.011 71
26	27 27 46.5	5 35 46.6	− 8 15.1	−2 23 25.9	+38 43.4	9.513 9211	0.016 8920	0.021 99
27	33 7 49.4	5 44 14.7	6 8.5	1 43 33.7	40 57.4	9.508 3319	0.027 0074	0.031 93
28	38 56 5.4	5 52 11.2	3 43.9	1 1 39.1	42 47.0	9.503 2526	0.036 7753	0.041 51
29	44 51 57.7	5 59 25.6	− 1 6.6	−0 18 9.5	44 6.5	9.498 7702	0.046 1623	0.050 70
30	50 54 38.9	6 5 47.2	+ 1 36.6	+0 26 22.2	44 50.5	9.494 9675	0.055 1367	0.059 45
31	57 3 11.0	6 11 5.7	+ 4 18.0	+1 11 18.3	+44 54.6	9.491 9193	0.063 6693	0.067 76
Aug. 1	63 16 26.0	6 15 11.5	6 49.2	1 55 57.3	44 15.9	9.489 6888	0.071 7348	0.075 58
2	69 33 7.1	6 17 56.5	9 2.2	2 39 35.5	42 53.1	9.488 3245	0.079 3115	0.082 91
3	75 51 50.1	6 19 14.6	10 49.5	3 21 29.2	40 47.2	9.487 8568	0.086 3826	0.089 72
4	82 11 6.1	6 19 2.2	12 5.3	4 0 56.6	38 1.2	9.488 2960	0.092 9362	0.096 01
5	88 29 24.1	6 17 18.8	+12 45.8	+4 37 19.9	+34 40.1	9.489 6322	0.098 9659	0.101 78
6	94 45 14.2	6 14 6.8	12 49.3	5 10 7.3	30 50.4	9.491 8358	0.104 4707	0.107 02
7	100 57 10.1	6 9 31.6	12 16.8	5 38 53.8	26 39.7	9.494 8592	0.109 4550	0.111 75
8	107 3 52.3	6 3 40.8	11 11.2	6 3 22.4	22 16.0	9.498 6393	0.113 9277	0.115 97
9	113 4 9.8	5 56 44.2	9 37.2	6 23 24.0	17 47.1	9.503 1016	0.117 9021	0.119 70
10	118 57 2.3	5 48 52.7	+ 7 40.8	+6 38 57.1	+13 20.0	9.508 1634	0.121 3946	0.122 96
11	124 41 40.8	5 40 17.9	5 28.6	6 50 6.6	9 0.9	9.513 7378	0.124 4250	0.125 77
12	130 17 27.5	5 31 11.2	3 7.2	6 57 3.2	4 54.8	9.519 7370	0.127 0146	0.128 15
13	135 43 56.2	5 21 43.7	+ 0 42.9	7 0 1.7	+ 1 5.2	9.526 0750	0.129 1859	0.130 12
14	141 0 51.2	5 12 5.3	− 1 38.7	6 59 19.9	− 2 25.6	9.532 6700	0.130 9621	0.131 70
15	146 8 6.0	5 2 24.8	− 3 52.8	+6 55 17.3	− 5 36.2	9.539 4460	0.132 3665	0.132 93
16	151 5 42.4	4 52 49.6	− 5 55.8	+6 48 14.3	− 8 26.3	9.546 3330	0.133 4221	0.133 82

MERCURY.

GREENWICH MEAN NOON.

ate.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
ʒ. 16	151 5 42.4	4 52 49.6	− 5 55.8	+6 48 14.3	− 8 26.3	9.546 3330	0.133 4221	0.133 8259
17	155 53 49.1	4 43 26.0	7 44.8	6 38 31.4	10 56.2	9.553 2689	0.134 1506	0.134 3987
18	160 32 39.9	4 34 18.7	9 18.1	6 26 28.3	13 6.9	9.560 1986	0.134 5728	0.134 6754
19	165 2 33.0	4 25 31.2	10 34.5	6 12 23.7	14 59.4	9.567 0742	0.134 7087	0.134 6751
20	169 23 49.7	4 17 6.3	11 33.8	5 56 35.1	16 35.2	9.573 8545	0.134 5766	0.134 4152
21	173 36 53.7	4 9 5.8	−12 16.0	+5 39 18.3	−17 55.9	9.580 5045	0.134 1929	0.133 9118
22	177 42 9.8	4 1 30.6	12 41.8	5 20 47.8	19 3.0	9.586 9949	0.133 5736	0.133 1799
23	181 40 3.6	3 54 21.4	12 52.0	5 1 16.4	19 58.0	9.593 3010	0.132 7323	0.132 2325
24	185 31 1.2	3 47 38.0	12 47.9	4 40 55.5	20 42.1	9.599 4029	0.131 6817	0.131 0814
25	189 15 28.2	3 41 20.2	12 30.5	4 19 55.3	21 16.8	9.605 2844	0.130 4329	0.129 7374
26	192 53 50.0	3 35 27.5	−12 1.3	+3 58 24.5	−21 43.4	9.610 9324	0.128 9960	0.128 2097
27	196 26 31.3	3 29 59.2	11 21.7	3 36 30.7	22 2.9	9.616 3366	0.127 3795	0.126 5064
28	199 53 56.1	3 24 54.3	10 32.9	3 14 20.8	22 16.1	9.621 4893	0.125 5911	0.124 6345
29	203 16 27.3	3 20 11.9	9 36.4	2 52 0.3	22 24.0	9.626 3843	0.123 6373	0.122 6002
30	206 34 27.0	3 15 51.1	8 33.3	2 29 34.3	22 27.3	9.631 0172	0.121 5236	0.120 4083
31	209 48 16.4	3 11 51.0	− 7 24.9	+2 7 7.1	−22 26.5	9.635 3850	0.119 2546	0.118 0631
pt. 1	212 58 15.6	3 8 10.7	6 12.3	1 44 42.4	22 22.3	9.639 4856	0.116 8340	0.115 5678
2	216 4 44.1	3 4 49.3	4 56.6	1 22 23.4	22 15.2	9.643 3179	0.114 2647	0.112 9250
3	219 8 0.2	3 1 45.9	3 38.8	1 0 12.8	22 5.6	9.646 8815	0.111 5489	0.110 1366
4	222 8 21.6	2 58 59.7	2 19.7	0 38 13.0	21 53.7	9.650 1764	0.108 6882	0.107 2039
5	225 6 5.1	2 56 30.0	− 1 0.3	+0 16 26.0	−21 39.9	9.653 2028	0.105 6836	0.104 1273
6	228 1 26.8	2 54 16.1	+ 0 18.7	−0 5 6.2	21 24.3	9.655 9617	0.102 5350	0.100 9067
7	230 54 42.3	2 52 17.4	1 36.6	0 26 22.1	21 7.2	9.658 4538	0.099 2422	0.097 5414
8	233 46 6.4	2 50 33.3	2 52.7	0 47 20.3	20 48.8	9.660 6799	0.095 8042	0.094 0304
9	236 35 53.5	2 49 3.3	4 6.4	1 7 59.4	20 29.2	9.662 6413	0.092 2197	0.090 3719
10	239 24 17.5	2 47 47.0	+ 5 17.0	−1 28 18.3	−20 8.5	9.664 3388	0.088 4867	0.086 5638
11	242 11 31.9	2 46 44.0	6 24.1	1 48 16.0	19 46.7	9.665 7733	0.084 6029	0.082 6036
12	244 57 49.9	2 45 54.1	7 27.2	2 7 51.3	19 23.7	9.666 9458	0.080 5656	0.078 4884
13	247 43 24.3	2 45 16.8	8 25.9	2 27 3.1	18 59.7	9.667 8570	0.076 3715	0.074 2146
14	250 28 27.7	2 44 52.0	9 19.6	2 45 50.4	18 34.7	9.668 5075	0.072 0171	0.069 7786
15	253 13 12.5	2 44 39.7	+10 8.1	−3 4 12.2	−18 8.7	9.668 8975	0.067 4985	0.065 1763
16	255 57 51.1	2 44 39.6	10 50.9	3 22 7.4	17 41.6	9.669 0275	0.062 8115	0.060 4034
17	258 42 35.7	2 44 51.6	11 27.8	3 39 34.9	17 13.2	9.668 8976	0.057 9515	0.055 4551
18	261 27 38.4	2 45 15.9	11 58.3	3 56 33.4	16 43.5	9.668 5075	0.052 9136	0.050 3264
19	264 13 11.6	2 45 52.5	12 22.3	4 13 1.5	16 12.5	9.667 8571	0.047 6928	0.045 0121
20	266 59 27.5	2 46 41.4	+12 39.4	−4 28 57.9	−15 40.0	9.666 9461	0.042 2837	0.039 5068
21	269 46 38.5	2 47 42.8	12 49.5	4 44 21.0	15 5.9	9.665 7736	0.036 6808	0.033 8049
22	272 34 57.3	2 48 57.0	12 52.2	4 59 9.1	14 30.0	9.664 3389	0.030 8784	0.027 9006
23	275 24 36.7	2 50 24.0	12 47.5	5 13 20.4	13 52.2	9.662 6415	0.024 8708	0.021 7883
24	278 15 49.7	2 52 4.3	12 35.2	5 26 52.7	13 12.1	9.660 6803	0.018 6524	0.015 4625
25	281 8 49.8	2 53 58.3	+12 15.2	−5 39 43.8	−12 29.6	9.658 4542	0.012 2178	0.008 9177
26	284 3 50.9	2 56 6.3	11 47.3	5 51 51.1	11 44.5	9.655 9622	0.005 5617	0.002 1491
27	287 1 7.3	2 58 28.8	11 11.8	6 3 11.9	10 56.6	9.653 2034	9.998 6794	9.995 1522
28	290 0 53.5	3 1 6.2	10 28.4	6 13 43.2	10 5.4	9.650 1770	9.991 5671	9.987 9236
29	293 3 24.9	3 3 59.2	9 37.4	6 23 21.5	9 10.6	9.646 8822	9.984 2217	9.980 4613
30	296 8 57.3	3 7 8.2	+ 8 39.0	−6 32 3.1	− 8 11.9	9.643 3186	9.976 6423	9.972 7647
Oct. 1	299 17 47.0	3 10 34.0	+ 7 33.4	−6 39 44.0	− 7 9.0	9.639 4862	9.968 8289	9.964 8354

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth—	
							At Date.	At Interm diate Dat
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 1	299 17 47.0	3 10 34.0	+ 7 33.4	−6 39 44.0	− 7 9.0	9.639 4862	9.968 8289	9.964 83
2	302 30 11.2	3 14 17.2	6 20.9	6 46 19.6	6 1.4	9.635 3857	9.960 7848	9.956 67
3	305 46 27.7	3 18 18.6	5 2.2	6 51 45.1	4 48.6	9.631 0180	9.952 5156	9.948 29
4	309 6 54.9	3 22 38.8	3 37.7	6 55 55.1	3 30.3	9.626 3851	9.944 0318	9.939 71
5	312 31 51.9	3 27 18.5	2 8.4	6 58 43.8	2 6.0	9.621 4902	9.935 3485	9.930 938
6	316 1 38.6	3 32 18.4	+ 0 35.0	−7 0 4.9	− 0 35.1	9.616 3377	9.926 4869	9.921 99
7	319 36 35.6	3 37 39.2	− 1 1.1	6 59 51.7	+ 1 2.8	9.610 9334	9.917 4756	9.912 92
8	323 17 4.2	3 43 21.5	2 38.7	6 57 56.9	2 48.2	9.605 2853	9.908 3530	9.903 76
9	327 3 26.0	3 49 25.8	4 16.2	6 54 12.7	4 41.5	9.599 4038	9.899 1686	9.894 57
10	330 56 3.2	3 55 52.4	5 51.9	6 48 31.1	6 43.1	9.593 3019	9.889 9848	9.885 41
11	334 55 18.4	4 2 41.7	− 7 23.6	−6 40 43.7	+ 8 53.3	9.586 9958	9.880 8799	9.876 38
12	339 1 34.1	4 9 53.4	8 49.1	6 30 41.8	11 12.1	9.580 5054	9.871 9489	9.867 58
13	343 15 12.5	4 17 27.1	10 5.9	6 18 16.7	13 39.5	9.573 8553	9.863 3065	9.859 13
14	347 36 35.4	4 25 22.0	11 11.3	6 3 20.1	16 15.1	9.567 0750	9.855 0875	9.851 18
15	352 6 3.2	4 33 36.8	12 2.6	5 45 43.9	18 58.4	9.560 1994	9.847 4470	9.843 89
16	356 43 55.0	4 42 9.5	−12 37.1	−5 25 21.1	+21 48.2	9.553 2696	9.840 5584	9.837 45
17	1 30 27.3	4 50 57.4	12 51.9	5 2 5.9	24 42.9	9.546 3337	9.834 6094	9.832 048
18	6 25 53.6	4 59 56.8	12 44.8	4 35 54.5	27 40.2	9.539 4467	9.829 7951	9.827 874
19	11 30 23.2	5 9 3.3	12 13.9	4 6 45.6	30 37.3	9.532 6708	9.826 3085	9.825 119
20	16 44 0.6	5 18 11.1	11 18.0	3 34 41.1	33 30.7	9.526 0757	9.824 3275	9.823 940
21	22 6 43.7	5 27 13.6	− 9 56.9	−2 59 46.9	+36 15.9	9.519 7376	9.824 0013	9.824 493
22	27 38 23.5	5 36 3.0	8 11.5	2 22 13.6	38 47.9	9.513 7382	9.825 4357	9.826 831
23	33 18 42.3	5 44 30.3	6 4.3	1 42 17.2	41 1.3	9.508 1636	9.828 6820	9.830 983
24	39 7 13.3	5 52 25.6	3 39.2	1 0 19.2	42 50.1	9.503 1017	9.833 7284	9.836 905
25	45 3 19.3	5 59 38.4	− 1 1.6	−0 16 47.1	44 8.5	9.498 6393	9.840 4986	9.844 490
26	51 6 12.5	6 5 58.2	+ 1 41.7	+0 27 46.0	+44 51.3	9.494 8591	9.848 8575	9.853 576
27	57 14 54.7	6 11 14.6	4 22.9	1 12 42.2	44 54.1	9.491 8357	9.858 6202	9.863 960
28	63 28 17.5	6 15 18.0	6 53.7	1 57 19.9	44 14.0	9.489 6319	9.869 5670	9.875 410
29	69 45 3.7	6 18 0.2	9 6.0	2 40 55.6	42 49.8	9.488 2955	9.881 4594	9.887 684
30	76 3 49.1	6 19 15.3	10 52.4	3 22 45.3	40 42.6	9.487 8562	9.894 0549	9.900 5426
31	82 23 4.6	6 19 0.1	+12 7.1	+4 2 7.5	+37 55.4	9.488 3240	9.907 1196	9.913 7598
Nov. 1	88 41 19.4	6 17 14.0	12 46.4	4 38 24.6	34 33.3	9.489 6881	9.920 4387	9.927 1334
2	94 57 3.4	6 13 59.3	12 48.8	5 11 4.8	30 42.9	9.491 9182	9.933 8228	9.940 4876
3	101 8 50.7	6 9 21.6	12 15.2	5 39 43.5	26 31.7	9.494 9663	9.947 1104	9.953 6756
4	107 15 21.9	6 3 28.7	11 8.6	6 4 3.9	22 7.6	9.498 7690	9.960 1693	9.966 5793
5	113 15 26.4	5 56 30.2	+ 9 33.9	+6 23 57.1	+17 38.6	9.503 2514	9.972 8951	9.979 1076
6	119 8 4.1	5 48 37.1	7 36.9	6 39 21.8	13 11.8	9.508 3307	9.985 2092	9.991 1934
7	124 52 26.3	5 40 1.1	5 24.3	6 50 23.3	8 53.1	9.513 9198	9.997 0549	0.002 7895
8	130 27 55.8	5 30 53.6	3 2.7	6 57 12.3	4 47.4	9.519 9310	0.008 3942	0.013 8667
9	135 54 6.7	5 21 25.6	+ 0 38.4	7 0 3.6	+ 0 58.3	9.526 2784	0.019 2056	0.024 4100
10	141 10 43.4	5 11 47.0	− 1 43.0	+6 59 15.2	− 2 31.8	9.532 8803	0.029 4796	0.034 4147
11	146 17 40.0	5 2 6.6	3 56.8	6 55 6.7	5 41.7	9.539 6606	0.039 2161	0.043 8849
12	151 14 58.5	4 52 31.8	5 59.4	6 47 58.5	8 31.2	9.546 5500	0.048 4227	0.052 8313
13	156 2 47.5	4 43 8.6	7 48.0	6 38 11.0	11 0.6	9.553 4864	0.057 1125	0.061 2686
14	160 41 21.1	4 34 1.7	9 20.7	6 26 3.8	13 10.6	9.560 4151	0.065 3019	0.069 2149
15	165 10 57.6	4 25 14.9	−10 36.6	+6 11 55.8	−15 2.5	9.567 2884	0.073 0100	0.076 6898
16	169 31 58.5	4 16 50.9	−11 35.3	+5 56 4.2	−16 37.9	9.574 0652	0.080 2570	0.083 7142

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
v. 16	169 31 58.5	4 16 50.9	−11 35.3	+5 56 4.2	−16 37.9	9.574 0652	0.080 2570	0.083 7142
17	173 44 47.5	4 8 51.2	12 17.0	5 38 44.9	17 58.2	9.580 7106	0.087 0640	0.090 3091
18	177 49 49.4	4 1 16.8	12 42.3	5 20 12.3	19 4.9	9.587 1954	0.093 4522	0.096 4958
19	181 47 29.8	3 54 8.3	12 52.1	5 0 39.2	19 59.4	9.593 4954	0.099 4423	0.102 2943
20	185 38 14.7	3 47 25.7	12 47.5	4 40 17.0	20 43.3	9.599 5906	0.105 0543	0.107 7246
21	189 22 29.9	3 41 8.8	−12 29.8	+4 19 15.7	−21 17.9	9.605 4650	0.110 3075	0.112 8052
22	193 0 40.7	3 35 16.9	12 0.3	3 57 44.0	21 44.2	9.611 1056	0.115 2200	0.117 5540
23	196 33 11.8	3 29 49.2	11 20.3	3 35 49.7	22 3.3	9.616 5021	0.119 8093	0.121 9878
24	200 0 27.0	3 24 45.0	10 31.3	3 13 39.4	22 16.4	9.621 6466	0.124 0912	0.126 1216
25	203 22 49.4	3 20 3.3	9 34.6	2 51 18.7	22 24.2	9.626 5333	0.128 0807	0.129 9703
26	206 40 40.9	3 15 43.2	− 8 31.3	+2 28 52.6	−22 27.3	9.631 1580	0.131 7920	0.133 5472
27	209 54 22.8	3 11 43.8	7 22.7	2 6 25.5	22 26.4	9.635 5175	0.135 2374	0.136 8641
28	213 4 15.2	3 8 4.2	6 10.0	1 44 0.9	22 22.2	9.639 6097	0.138 4288	0.139 9328
29	216 10 37.4	3 4 43.3	4 54.2	1 21 42.1	22 15.0	9.643 4336	0.141 3773	0.142 7636
30	219 13 47.8	3 1 40.4	3 36.4	0 59 31.8	22 5.2	9.646 9887	0.144 0928	0.145 3659
ec. 1	222 14 4.0	2 58 54.7	− 2 17.3	+0 37 32.4	−21 53.3	9.650 2751	0.146 5839	0.147 7480
2	225 11 42.8	2 56 25.5	− 0 57.8	+0 15 45.9	21 39.5	9.653 2932	0.148 8591	0.149 9181
3	228 7 0.3	2 54 12.1	+ 0 21.2	−0 5 45.9	21 23.9	9.656 0437	0.150 9257	0.151 8828
4	231 0 12.1	2 52 13.9	1 39.0	0 27 1.3	21 6.7	9.658 5275	0.152 7900	0.153 6482
5	233 51 33.0	2 50 30.3	2 55.0	0 47 58.9	20 48.2	9.660 7454	0.154 4580	0.155 2202
6	236 41 17.3	2 49 0.7	+ 4 8.6	−1 8 37.4	−20 28.6	9.662 6984	0.155 9352	0.156 [illegible]037
7	239 29 38.9	2 47 44.8	5 19.1	1 28 55.7	20 7.8	9.664 3876	0.157 2261	0.157 8030
8	242 16 51.4	2 46 42.2	6 26.1	1 48 52.7	19 45.9	9.665 8141	0.158 3347	0.158 8217
9	245 3 7.8	2 45 52.7	7 29.1	2 8 27.2	19 23.0	9.666 9785	0.159 2644	0.159 6631
10	247 48 41.0	2 45 15.9	8 27.6	2 27 38.3	18 59.0	9.667 8815	0.160 0180	0.160 5295
11	250 33 43.7	2 44 51.5	+ 9 21.2	−2 46 24.9	−18 33.9	9.668 5237	0.160 5979	0.160 8234
12	253 18 28.2	2 44 39.5	10 9.5	3 4 45.9	18 7.8	9.668 9057	0.161 0061	0.161 1462
13	256 3 6.8	2 44 39.7	10 52.2	3 22 40.2	17 40.6	9.669 0275	0.161 2437	0.161 2988
14	258 47 51.8	2 44 52.2	11 28.8	3 40 6.8	17 12.3	9.668 8894	0.161 3114	0.161 2816
15	261 32 55.3	2 45 16.9	11 59.2	3 57 4.3	16 42.7	9.668 4913	0.161 2094	0.161 0948
16	264 18 29.6	2 45 53.8	+12 23.0	−4 13 31.5	−16 11.6	9.667 8329	0.160 9376	0.160 7377
17	267 4 47.0	2 46 43.1	12 39.9	4 29 26.9	15 39.0	9.666 9138	0.160 4948	0.160 2089
18	269 52 0.0	2 47 44.9	12 49.7	4 44 49.0	15 4.8	9.665 7332	0.159 8796	0.159 5068
19	272 40 21.1	2 48 59.4	12 52.2	4 59 36.0	14 28.9	9.664 2903	0.159 0901	0.158 6292
20	275 30 3.1	2 50 26.9	12 47.3	5 13 46.1	13 51.0	9.662 5846	0.158 1237	0.157 5732
21	278 21 19.3	2 52 7.7	+12 34.7	−5 27 17.2	−13 10.8	9.660 6151	0.156 9772	0.156 3353
22	281 14 23.0	2 54 2.1	12 14.5	5 40 7.0	12 28.3	9.658 3807	0.155 6468	0.154 9113
23	284 9 28.1	2 56 10.5	11 46.4	5 52 12.9	11 43.1	9.655 8805	0.154 1281	0.153 2965
24	287 6 48.9	2 58 33.5	11 10.6	6 3 32.2	10 55.0	9.653 1134	0.152 4158	0.151 4853
25	290 6 40.1	3 1 11.4	10 27.0	6 14 1.9	10 3.7	9.650 0786	0.150 5043	0.149 4719
26	293 9 16.9	3 4 4.8	+ 9 35.8	−6 23 38.5	− 9 8.8	9.646 7754	0.148 3871	0.147 2490
27	296 14 55.2	3 7 14.4	8 37.1	6 32 18.3	8 10.0	9.643 2035	0.146 0566	0.144 8089
28	299 23 51.4	3 10 40.8	7 31.2	6 39 57.2	7 7.0	9.639 3628	0.143 5047	0.142 1430
29	302 36 22.6	3 14 24.6	6 18.6	6 46 30.7	5 59.3	9.635 2539	0.140 7224	0.139 2417
30	305 52 46.6	3 18 26.5	4 59.6	6 51 54.0	4 46.4	9.630 8779	0.137 6995	0.136 0945
31	309 13 21.9	3 22 47.3	+ 3 35.0	−6 56 1.6	− 3 27.9	9.626 2369	0.134 4252	0.132 6900
32	312 38 27.7	3 27 27.6	+ 2 5.5	−6 58 47.7	− 2 3.3	9.621 3339	0.130 8872	0.129 0153

URANUS, 1915.

GREENWICH MEAN TIME.

Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Merid-ian Pas-sage.	Month and Day.	Apparent Right Ascension.	Var. of R. A. for 1 Day.	Apparent Declination.	Var. of Decl. for 1 Day.	Me ian sag
	Noon.	Noon.	Noon.	Noon.			Noon.	Noon.	Noon.	Noon.	
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h
Jan. 0	20 49 49.31	+12.659	−18 23 56.8	+50.97	2 13.2	July 3	21 10 35.83	− 7.262	−17 1 11.4	−33.66	14 2
4	20 50 40.67	13.010	18 20 29.8	52.48	1 58.3	7	21 10 5.80	7.744	17 3 30.0	35.57	14 1
8	20 51 33.33	13.315	18 16 57.1	53.86	1 43.5	11	21 9 33.94	8.177	17 5 55.7	37.26	13 5
12	20 52 27.13	13.577	18 13 19.3	55.06	1 28.6	15	21 9 0.45	8.557	17 8 27.7	38.68	13 3
16	20 53 21.89	13.791	18 9 37.0	56.06	1 13.8	19	21 8 25.56	8.879	17 11 4.8	39.82	13 2
20	20 54 17.40	+13.951	−18 5 51.1	+56.86	0 59.0	23	21 7 49.50	− 9.142	−17 13 45.9	−40.69	13 5
24	20 55 13.44	14.059	18 2 2.4	57.46	0 44.2	27	21 7 12.51	9.346	17 16 30.0	41.30	12 4
28	20 56 9.81	14.120	17 58 11.6	57.87	0 29.4	31	21 6 34.81	9.494	17 19 16.0	41.65	12 3
Feb. 1	20 57 6.34	14.137	17 54 19.6	58.11	0 14.6	Aug. 4	21 5 56.64	9.582	17 22 2.9	41.76	12 16
5	20 58 2.85	14.110	17 50 27.1	58.15	23 56.1	8	21 5 18.24	9.606	17 24 49.7	41.57	11 59
9	20 58 59.16	+14.037	−17 46 34.8	+57.98	23 41.4	12	21 4 39.88	− 9.563	−17 27 35.1	−41.09	11 43
13	20 59 55.08	13.912	17 42 43.5	57.62	23 26.5	16	21 4 1.82	9.456	17 30 18.0	40.33	11 26
17	21 0 50.39	13.738	17 38 54.0	57.05	23 11.7	20	21 3 24.32	9.284	17 32 57.4	39.29	11 10
21	21 1 44.92	13.515	17 35 7.4	56.27	22 56.9	24	21 2 47.63	9.051	17 35 32.0	38.02	10 54
25	21 2 38.46	13.249	17 31 24.2	55.28	22 42.0	28	21 2 11.99	8.761	17 38 1.2	36.53	10 37
Mar. 1	21 3 30.86	+12.944	−17 27 45.4	+54.08	22 27.1	Sept. 1	21 1 37.62	− 8.415	−17 40 24.0	−34.81	10 21
5	21 4 21.96	12.601	17 24 11.7	52.73	22 12.3	5	21 1 4.75	8.011	17 42 39.4	32.86	10 5
9	21 5 11.61	12.216	17 20 43.8	51.18	21 57.4	9	21 0 33.61	7.549	17 44 46.6	30.70	9 49
13	21 5 59.63	11.787	17 17 22.5	49.43	21 42.5	13	21 0 4.43	7.032	17 46 44.7	28.32	9 32
17	21 6 45.85	11.316	17 14 8.6	47.48	21 27.5	17	20 59 37.42	6.466	17 48 32.9	25.75	9 16
21	21 7 30.11	+10.807	−17 11 2.9	+45.34	21 12.5	21	20 59 12.76	− 5.858	−17 50 10.5	−23.05	9 0
25	21 8 12.26	10.263	17 8 6.1	43.04	20 57.5	25	20 58 50.61	5.213	17 51 37.1	20.22	8 44
29	21 8 52.17	9.690	17 5 18.8	40.58	20 42.4	29	20 58 31.10	4.532	17 52 52.1	17.26	8 28
Apr. 2	21 9 29.73	9.090	17 2 41.6	37.97	20 27.3	Oct. 3	20 58 14.39	3.816	17 53 55.0	14.18	8 12
6	21 10 4.84	8.460	17 0 15.2	35.22	20 12.1	7	20 58 0.61	3.068	17 54 45.4	10.99	7 56
10	21 10 37.37	+ 7.797	−16 58 0.0	+32.34	19 56.9	11	20 57 49.88	− 2.295	−17 55 22.8	− 7.70	7 40
14	21 11 7.18	7.105	16 55 56.7	29.30	19 41.7	15	20 57 42.28	1.501	17 55 46.9	4.36	7 24
18	21 11 34.18	6.392	16 54 5.8	26.14	19 26.4	19	20 57 37.89	− 0.693	17 55 57.6	− 0.98	7 8.9
22	21 11 58.29	5.661	16 52 27.7	22.90	19 11.1	23	20 57 36.74	+ 0.122	17 55 54.7	+ 2.42	6 53
26	21 12 19.45	4.916	16 51 2.7	19.57	18 55.7	27	20 57 38.87	0.942	17 55 38.2	5.83	6 37
30	21 12 37.60	+ 4.158	−16 49 51.2	+16.18	18 40.2	31	20 57 44.28	+ 1.765	−17 55 8.0	+ 9.26	6 21.9
May 4	21 12 52.70	3.388	16 48 53.3	12.74	18 24.7	Nov. 4	20 57 52.99	2.590	17 54 24.1	12.68	6 6.3
8	21 13 4.69	2.608	16 48 9.3	9.25	18 9.2	8	20 58 5.00	3.413	17 53 26.6	16.08	5 50.8
12	21 13 13.55	1.820	16 47 39.3	5.73	17 53.6	12	20 58 20.28	4.224	17 52 15.5	19.46	5 35.3
16	21 13 19.24	1.028	16 47 23.5	+ 2.19	17 38.0	16	20 58 38.77	5.018	17 50 51.0	22.77	5 19.9
20	21 13 21.77	+ 0.238	−16 47 21.8	− 1.33	17 22.3	20	20 59 0.40	+ 5.792	−17 49 13.5	+25.98	5 4.5
24	21 13 21.15	− 0.545	16 47 34.1	4.81	17 6.5	24	20 59 25.08	6.543	17 47 23.4	29.11	4 49
28	21 13 17.42	1.316	16 48 0.2	8.22	16 50.7	28	20 59 52.72	7.274	17 45 20.9	32.16	4 33.9
June 1	21 13 10.64	2.072	16 48 39.7	11.56	16 34.9	Dec. 2	21 0 23.24	7.983	17 43 6.2	35.14	4 18.7
5	21 13 0.86	2.818	16 49 32.5	14.83	16 19.0	6	21 0 56.54	8.662	17 40 39.8	38.07	4 3.5
9	21 12 48.12	− 3.548	−16 50 38.3	−18.01	16 3.0	10	21 1 32.48	+ 9.305	−17 38 2.2	+40.77	3 48.4
13	21 12 32.51	4.251	16 51 56.5	21.05	15 47.0	14	21 2 10.93	9.912	17 35 13.8	43.38	3 33.3
17	21 12 14.15	4.925	16 53 26.5	23.94	15 31.0	18	21 2 51.73	10.478	17 32 15.3	45.84	3 18.3
21	21 11 53.16	5.566	16 55 7.8	26.66	15 14.9	22	21 3 34.71	11.005	17 29 7.3	48.14	3 3.3
25	21 11 20.67	6.172	16 56 59.5	29.18	14 58.8	26	21 4 19.72	11.495	17 25 50.4	50.30	2 48.3
29	21 11 3.84	− 6.737	−16 59 1.0	−31.52	14 42.6	30	21 5 6.62	+11.948	−17 22 25.2	+52.32	2 33.3
July 3	21 10 35.83	− 7.262	−17 1 11.4	−33.66	14 26.4	34	21 5 55.25	+12.356	−17 18 52.1	+54.18	2 18.4

Least semidiameter,	February 2, 1″.61	Least horizontal parallax,	February 2, 0″.42
Greatest semidiameter,	August 6, 1″.77	Greatest horizontal parallax,	August 6, 0″.47

NEPTUNE, 1915.

GREENWICH MEAN TIME.

th d y.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.	Month and Day.	Apparent Right Ascension. Noon.	Var. of R. A. for 1 Day. Noon.	Apparent Declination. Noon.	Var. of Decl. for 1 Day. Noon.	Meridian Passage.
	h m s	s	° ′ ″	″	h m		h m s	s	° ′ ″	″	h m
0	8 6 45.63	−6.477	+19 52 26.8	+19.94	13 28.2	July 3	8 6 0.83	+8.861	+19 58 5.2	−25.70	1 24.1
4	8 6 19.29	6.682	19 53 47.8	20.55	13 12.0	7	8 6 36.57	9.005	19 56 21.2	26.30	1 8.9
8	8 5 52.22	6.846	19 55 10.9	21.02	12 55.9	11	8 7 12.83	9.118	19 54 35.0	26.81	0 53.8
12	8 5 24.58	6.965	19 56 35.7	21.36	12 39.7	15	8 7 49.47	9.197	19 52 46.9	27.22	0 38.7
16	8 4 56.57	7.034	19 58 1.6	21.56	12 23.5	19	8 8 26.37	9.246	19 50 57.4	27.53	0 23.6
20	8 4 28.38	−7.055	+19 59 28.0	+21.61	12 7.3	23	8 9 3.39	+9.261	+19 49 6.8	−27.75	0 8.5
24	8 4 0.19	7.030	20 0 54.3	21.51	11 51.1	27	8 9 40.41	9.246	19 47 15.6	27.88	23 49.6
28	8 3 32.20	6.960	20 2 19.9	21.29	11 34.9	31	8 10 17.32	9.203	19 45 24.0	27.91	23 34.5
b. 1	8 3 4.57	6.845	20 3 44.4	20.94	11 18.7	Aug. 4	8 10 53.99	9.130	19 43 32.4	27.86	23 19.4
5	8 2 37.50	6.687	20 5 7.3	20.47	11 2.6	8	8 11 30.31	9.024	19 41 41.3	27.71	23 4.2
9	8 2 11.13	−6.487	+20 6 28.0	+19.86	10 46.4	12	8 12 6.14	+8.886	+19 39 51.0	−27.43	22 49.1
13	8 1 45.65	6.243	20 7 46.0	19.14	10 30.2	16	8 12 41.36	8.715	19 38 2.0	27.06	22 33.9
17	8 1 21.24	5.957	20 9 0.9	18.31	10 14.1	20	8 13 15.83	8.514	19 36 14.7	26.57	22 18.8
21	8 0 58.05	5.631	20 10 12.2	17.36	9 58.0	24	8 13 49.44	8.285	19 34 29.6	25.97	22 3.6
25	8 0 36.24	5.271	20 11 19.6	16.32	9 41.9	28	8 14 22.07	8.029	19 32 47.0	25.29	21 48.4
r. 1	8 0 15.93	−4.880	+20 12 22.7	+15.19	9 25.9	Sept. 1	8 14 53.64	+7.747	+19 31 7.4	−24.53	21 33.2
5	7 59 57.24	4.460	20 13 21.0	13.98	9 9.8	5	8 15 24.01	7.434	19 29 31.0	23.66	21 18.0
9	7 59 40.29	4.013	20 14 14.4	12.72	8 53.8	9	8 15 53.07	7.092	19 27 58.3	22.67	21 2.7
13	7 59 25.17	3.540	20 15 2.6	11.38	8 37.8	13	8 16 20.70	6.721	19 26 29.8	21.58	20 47.4
17	7 59 12.00	3.041	20 15 45.3	9.96	8 21.9	17	8 16 46.81	6.326	19 25 5.8	20.38	20 32.1
21	7 59 0.86	−2.524	+20 16 22.3	+ 8.50	8 6.0	21	8 17 11.29	+5.909	+19 23 46.8	−19.10	20 16.8
25	7 58 51.82	1.994	20 16 53.3	7.01	7 50.1	25	8 17 34.06	5.473	19 22 33.1	17.77	20 1.5
29	7 58 44.93	1.453	20 17 18.3	5.49	7 34.3	29	8 17 55.05	5.016	19 21 24.8	16.35	19 46.1
pr. 2	7 58 40.21	0.905	20 17 37.2	3.94	7 18.5	Oct. 3	8 18 14.16	4.536	19 20 22.5	14.84	19 30.6
6	7 58 37.70	−0.350	20 17 49.8	2.37	7 2.7	7	8 18 31.31	4.037	19 19 26.3	13.23	19 15.2
10	7 58 37.42	+0.211	+20 17 56.1	+ 0.79	6 47.0	11	8 18 46.43	+3.519	+19 18 36.7	−11.57	18 59.7
14	7 58 39.39	0.774	20 17 56.1	− 0.80	6 31.3	15	8 18 59.45	2.988	19 17 53.9	9.84	18 44.2
18	7 58 43.60	1.335	20 17 49.7	2.39	6 15.6	19	8 19 10.32	2.447	19 17 18.1	8.08	18 28.6
22	7 58 50.06	1.890	20 17 37.0	3.98	6 0.0	23	8 19 19.02	1.900	19 16 49.3	6.28	18 13.1
26	7 58 58.72	2.435	20 17 17.9	5.55	5 44.4	27	8 19 25.52	1.344	19 16 27.9	4.45	17 57.4
30	7 59 9.53	+2.970	+20 16 52.6	− 7.09	5 28.9	31	8 19 29.78	+0.782	+19 16 13.7	− 2.60	17 41.8
ay 4	7 59 22.46	3.494	20 16 21.2	8.60	5 13.4	Nov. 4	8 19 31.77	+0.214	19 16 7.1	− 0.71	17 26.1
8	7 59 37.46	4.006	20 15 43.8	10.09	4 57.9	8	8 19 31.50	−0.353	19 16 8.1	+ 1.18	17 10.3
12	7 59 54.49	4.504	20 15 0.5	11.57	4 42.4	12	8 19 28.96	0.911	19 16 16.5	3.05	16 54.6
16	8 0 13.47	4.984	20 14 11.3	13.01	4 27.0	16	8 19 24.21	1.463	19 16 32.4	4.88	16 38.7
20	8 0 34.33	+5.443	+20 13 16.5	−14.40	4 11.7	20	8 19 17.27	−2.005	+19 16 55.5	+ 6.68	16 22.9
24	8 0 56.98	5.879	20 12 16.2	15.72	3 56.3	24	8 19 8.19	2.535	19 17 25.7	8.45	16 7.0
28	8 1 21.33	6.292	20 11 10.8	16.99	3 41.0	28	8 18 57.01	3.051	19 18 3.0	10.17	15 51.1
une 1	8 1 47.28	6.682	20 10 0.3	18.22	3 25.7	Dec. 2	8 18 43.81	3.548	19 18 47.0	11.81	15 35.1
5	8 2 14.76	7.051	20 8 45.1	19.40	3 10.4	6	8 18 28.66	4.023	19 19 37.4	13.39	15 19.2
9	8 2 43.66	+7.395	+20 7 25.2	−20.52	2 55.2	10	8 18 11.66	−4.473	+19 20 34.0	+14.88	15 3.1
13	8 3 13.89	7.713	20 6 1.0	21.58	2 39.9	14	8 17 52.92	4.891	19 21 36.2	16.24	14 47.1
17	8 3 45.33	8.002	20 4 32.7	22.56	2 24.7	18	8 17 32.57	5.278	19 22 43.8	17.50	14 31.0
21	8 4 17.86	8.259	20 3 0.7	23.46	2 9.6	22	8 17 10.74	5.632	19 23 56.1	18.65	14 14.9
25	8 4 51.36	8.487	20 1 25.2	24.28	1 54.4	26	8 16 47.57	5.948	19 25 12.8	19.68	13 58.8
29	8 5 25.72	+8.689	+19 59 46.6	−25.02	1 39.2	30	8 16 23.21	−6.229	+19 26 33.4	+20.58	13 42.7
July 3	8 6 0.83	+8.861	+19 58 5.2	−25.70	1 24.1	34	8 15 57.79	−6.471	+19 27 57.3	+21.35	13 26.5

Greatest semidiameter, January 19, 1″.33
Least semidiameter, July 23, 1″.25

Greatest horizontal parallax, January 19, 0″.30
Least horizontal parallax, July 23, 0″.28

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fro Earth—	
							At Date.	At Interme diate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 1	272 18 49.5	2 48 49.6	+12 52.3	−4 57 48.5	−14 33.3	9.664 4806	0.158 6808	0.158 59
2	275 8 21.0	2 50 15.5	12 48.3	5 12 3.2	13 55.7	9.662 8071	0.158 4642	0.158 29
3	277 59 25.0	2 51 54.6	12 36.7	5 25 39.2	13 16.0	9.660 8699	0.158 0757	0.157 81
4	280 52 14.8	2 53 47.4	12 17.4	5 38 34.3	12 33.8	9.658 6679	0.157 5128	0.157 10
5	283 47 4.4	2 55 54.1	11 50.3	5 50 45.8	11 48.9	9.656 2001	0.156 7721	0.156 33
6	286 44 7.8	2 58 15.2	+11 15.4	−6 2 11.0	−11 1.1	9.653 4657	0.155 8497	0.155 31
7	289 43 39.8	3 0 51.2	10 32.8	6 12 47.0	10 10.2	9.650 4638	0.154 7411	0.154 11
8	292 45 55.5	3 3 42.7	9 42.5	6 22 30.4	9 15.8	9.647 1935	0.153 4411	0.152 71
9	295 51 10.7	3 6 50.3	8 44.7	6 31 17.4	8 17.5	9.643 6545	0.151 9434	0.151 11
10	298 59 41.8	3 10 14.6	7 39.7	6 39 4.0	7 15.0	9.639 8467	0.150 2411	0.149 311
11	302 11 45.8	3 13 56.3	+ 6 27.9	−6 45 45.9	− 6 7.9	9.635 7705	0.148 3270	0.147 28
12	305 27 40.4	3 17 56.0	5 9.7	6 51 18.1	4 55.7	9.631 4272	0.146 1918	0.145 03
13	308 47 44.0	3 22 14.4	3 45.7	6 55 35.4	3 37.9	9.626 8183	0.143 8261	0.142 55
14	312 12 15.6	3 26 52.2	2 16.8	6 58 31.9	2 14.0	9.621 9473	0.141 2199	0.139 82
15	315 41 35.1	3 31 50.1	+ 0 43.8	7 0 1.3	− 0 43.7	9.616 8181	0.138 3611	0.136 83
16	319 16 2.9	3 37 9.0	− 0 52.2	−6 59 57.0	+ 0 53.5	9.611 4367	0.135 2372	0.133 571
17	322 56 0.3	3 42 49.4	2 29.7	6 58 11.8	2 38.2	9.605 8107	0.131 8342	0.130 023
18	326 41 49.0	3 48 51.7	4 7.3	6 54 38.0	4 30.7	9.599 9502	0.128 1371	0.126 173
19	330 33 51.1	3 55 16.3	5 43.2	6 49 7.6	6 31.5	9.593 8680	0.124 1295	0.122 003
20	334 32 29.0	4 2 3.4	7 15.3	6 41 32.1	8 40.9	9.587 5798	0.119 7939	0.117 497
21	338 38 5.4	4 9 13.1	− 8 41.5	−6 31 42.9	+10 58.9	9.581 1055	0.115 1113	0.112 6337
22	342 51 2.5	4 16 44.8	9 59.2	6 19 31.4	13 25.5	9.574 4691	0.110 0617	0.107 39
23	347 11 42.0	4 24 37.8	11 5.8	6 4 49.1	16 0.5	9.567 6996	0.104 6237	0.101 752
24	351 40 24.8	4 32 50.9	11 58.6	5 47 27.9	18 43.1	9.560 8313	0.098 7747	0.095 6891
25	356 17 29.8	4 41 22.0	12 34.7	5 27 20.6	21 32.4	9.553 9048	0.092 4921	0.089 1808
26	1 3 13.9	4 50 8.5	−12 51.4	−5 4 21.4	+24 26.6	9.546 9674	0.085 7522	0.082 2034
27	5 57 50.9	4 59 7.0	12 46.4	4 38 26.3	27 23.8	9.540 0737	0.078 5314	0.074 7335
28	11 1 30.5	5 8 13.0	12 17.8	4 9 33.7	30 21.2	9.533 2852	0.070 8070	0.066 7491
29	16 14 17.7	5 17 21.0	11 24.2	3 37 45.1	33 15.1	9.526 6707	0.062 5574	0.058 2295
30	21 36 11.1	5 26 24.4	10 5.3	3 3 6.1	36 1.2	9.520 3060	0.053 7633	0.049 1571
31	27 7 2.3	5 35 15.3	− 8 22.1	−2 25 46.9	+38 34.7	9.514 2724	0.044 4094	0.039 5191
Feb. 1	32 46 34.5	5 43 44.9	6 16.8	1 46 2.8	40 50.0	9.508 6556	0.034 4854	0.029 3080
2	38 34 21.7	5 51 43.5	3 53.1	1 4 14.9	42 41.2	9.503 5433	0.023 9872	0.018 5239
3	44 29 47.7	5 59 0.7	− 1 16.4	−0 20 50.2	44 2.7	9.499 0229	0.012 9197	0.007 1768
4	50 32 5.7	6 5 25.8	+ 1 26.7	+0 23 38.8	44 49.0	9.495 1773	0.001 2983	9.995 2880
5	56 40 18.4	6 10 48.3	+ 4 8.4	+1 8 34.6	+44 55.6	9.492 0820	9.989 1509	9.982 8926
6	62 53 18.3	6 14 58.6	6 40.5	1 53 15.8	44 19.5	9.489 8012	9.976 5200	9.970 0410
7	69 9 49.0	6 17 48.6	8 54.8	2 36 58.9	42 59.4	9.488 3840	9.963 4646	9.956 8010
8	75 28 26.8	6 19 12.0	10 43.8	3 19 0.2	40 56.1	9.487 8619	9.950 0616	9.943 2591
9	81 47 43.1	6 19 5.1	12 1.7	3 58 37.6	38 12.4	9.488 2467	9.936 4072	9.929 5208
10	88 6 6.9	6 17 27.3	+12 44.4	+4 35 13.1	+34 53.2	9.489 5296	9.922 6162	9.915 7108
11	94 22 8.1	6 14 20.7	12 50.1	5 8 14.3	31 5.1	9.491 6822	9.908 8231	9.901 9727
12	100 34 20.2	6 9 50.3	12 19.7	5 37 16.0	26 55.4	9.494 6578	9.895 1799	9.888 4658
13	106 41 23.1	6 4 3.7	11 16.0	6 2 0.6	22 32.2	9.498 3943	9.881 8525	9.875 3624
14	112 42 5.4	5 57 10.7	9 43.6	6 22 18.5	18 3.4	9.502 8177	9.869 0182	9.862 8430
15	118 35 26.0	5 49 22.2	+ 7 48.4	+6 38 7.8	+13 36.1	9.507 8458	9.856 8597	9.851 0909
16	124 20 35.1	5 40 49.6	+ 5 37.0	+6 49 33.1	+ 9 16.4	9.513 3918	9.845 5587	9.840 2844

MERCURY.

GREENWICH MEAN NOON.

ate.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
b. 15	118 35 26.0	5 49 22.2	+ 7 48.4	+6 38 7.8	+13 36.1	9.507 8458	9.856 8597	9.851 0909
16	124 20 35.1	5 40 49.6	5 37.0	6 49 33.1	9 16.4	9.513 3918	9.845 5587	9.840 2844
17	129 56 54.4	5 31 44.5	3 16.0	6 56 44.7	5 9.4	9.519 3678	9.835 2881	9.830 5888
18	135 23 57.0	5 22 18.0	+ 0 51.7	6 59 57.3	+ 1 18.7	9.525 6877	9.826 2038	9.822 1487
19	140 41 26.6	5 12 40.1	− 1 30.2	6 59 28.3	− 2 13.3	9.532 2693	9.818 4372	9.815 0808
20	145 49 16.2	5 2 59.6	− 3 44.9	+6 55 37.4	− 5 25.1	9.539 0361	9.812 0886	9.809 4673
21	150 47 27.2	4 53 24.0	5 48.6	6 48 44.9	8 16.4	9.545 9181	9.807 2211	9.805 3517
22	155 36 7.7	4 43 59.5	7 38.6	6 39 11.2	10 47.6	9.552 8524	9.803 8584	9.802 7381
23	160 15 31.4	4 34 51.0	9 12.8	6 27 16.1	12 59.4	9.559 7837	9.801 9853	9.801 5923
24	164 45 56.3	4 26 2.3	10 30.3	6 13 18.5	14 52.9	9.566 6636	9.801 5497	9.801 8463
25	169 7 43.4	4 17 36.0	−11 30.6	+5 57 35.8	−16 29.7	9.573 4505	9.802 4693	9.803 4048
26	173 21 16.3	4 9 34.0	12 13.9	5 40 24.1	17 51.3	9.580 1091	9.804 6377	9.806 1522
27	177 26 59.8	4 1 57.3	12 40.7	5 21 57.7	18 59.2	9.586 6097	9.807 9318	9.809 9598
28	181 25 19.6	3 54 46.5	12 51.8	5 2 29.8	19 54.9	9.592 9274	9.812 2192	9.814 6930
ar. 1	185 16 41.5	3 48 1.5	12 48.5	4 42 11.7	20 39.7	9.599 0420	9.817 3647	9.820 2177
2	189 1 31.3	3 41 42.2	−12 31.9	+4 21 13.6	−21 15.0	9.604 9371	9.823 2358	9.826 4039
3	192 40 14.4	3 35 48.0	12 3.4	3 59 44.5	21 42.0	9.610 5994	9.829 7072	9.833 1314
4	196 13 15.6	3 30 18.2	11 24.4	3 37 52.0	22 1.8	9.616 0185	9.836 6631	9.840 2895
5	199 40 58.8	3 25 11.9	10 36.2	3 15 42.9	22 15.4	9.621 1864	9.843 9988	9.847 7796
6	203 3 47.0	3 20 28.2	9 40.1	2 53 23.0	22 23.6	9.626 0969	9.851 6214	9.855 5146
7	206 22 2.5	3 16 6.3	− 8 37.4	+2 30 57.2	−22 27.1	9.630 7456	9.859 4502	9.863 4200
8	209 36 6.5	3 12 5.0	7 29.3	2 8 30.0	22 26.6	9.635 1293	9.867 4164	9.871 4322
9	212 46 19.1	3 8 23.5	6 16.9	1 46 5.1	22 22.6	9.639 2460	9.875 4610	9.879 4970
10	215 52 59.8	3 5 0.9	5 1.4	1 23 45.7	22 15.7	9.643 0945	9.883 5348	9.887 5696
11	218 56 27.0	3 1 56.4	3 43.6	1 1 34.5	22 6.2	9.646 6743	9.891 5971	9.895 6134
12	221 56 58.5	2 59 9.2	− 2 24.6	+0 39 34.0	−21 54.4	9.649 9854	9.899 6150	9.903 5987
13	224 54 51.1	2 56 38.6	− 1 5.2	+0 17 46.3	21 40.6	9.653 0280	9.907 5618	9.911 5018
14	227 50 20.9	2 54 23.8	+ 0 13.9	−0 3 46.9	21 25.2	9.655 8029	9.915 4164	9.919 3036
15	230 43 43.6	2 52 24.2	1 31.9	0 25 3.8	21 8.3	9.658 3110	9.923 1618	9.926 9895
16	233 35 14.1	2 50 39.2	2 48.1	0 46 3.1	20 50.0	9.660 5532	9.930 7855	9.934 5486
17	236 25 6.7	2 49 8.3	+ 4 1.9	−1 6 43.5	−20 30.5	9.662 5305	9.938 2781	9.941 9730
18	239 13 35.3	2 47 51.2	5 12.7	1 27 3.7	20 9.8	9.664 2439	9.945 6327	9.949 2567
19	242 0 53.6	2 46 47.4	6 20.1	1 47 2.7	19 48.0	9.665 6944	9.952 8446	9.956 3962
20	244 47 14.6	2 45 56.7	7 23.5	2 6 39.4	19 25.1	9.666 8829	9.959 9111	9.963 3892
21	247 32 51.3	2 45 18.7	8 22.4	2 25 52.7	19 1.2	9.667 8099	9.966 8305	9.970 2350
22	250 17 56.2	2 44 53.2	+ 9 16.5	−2 44 41.5	−18 36.3	9.668 4761	9.973 6027	9.976 9337
23	253 2 41.9	2 44 40.0	10 5.3	3 3 4.9	18 10.3	9.668 8821	9.980 2282	9.983 4863
24	255 47 20.5	2 44 39.1	10 48.5	3 21 1.8	17 43.2	9.669 0280	9.986 7082	9.989 8941
25	258 32 4.3	2 44 50.5	11 25.7	3 38 31.0	17 15.0	9.668 9139	9.993 0444	9.996 1592
26	261 17 5.6	2 45 14.1	11 56.7	3 55 31.3	16 45.4	9.668 5397	9.999 2389	0.002 2837
27	264 2 36.6	2 45 49.9	+12 21.0	−4 12 1.3	−16 14.4	9.667 9053	0.005 2940	0.008 2699
28	266 48 49.5	2 46 38.0	12 38.6	4 27 59.7	15 42.1	9.667 0101	0.011 2118	0.014 1202
29	269 35 56.8	2 47 38.6	12 49.1	4 43 24.9	15 8.1	9.665 8536	0.016 9952	0.019 8370
30	272 24 11.0	2 48 52.0	12 52.3	4 58 15.3	14 32.3	9.664 4352	0.022 6460	0.025 4226
31	275 13 45.1	2 50 18.3	12 48.0	5 12 28.9	13 54.5	9.662 7540	0.028 1668	0.030 8790
Apr. 1	278 4 52.0	2 51 57.8	+12 36.2	−5 26 3.7	−13 14.6	9.660 8091	0.033 5594	0.036 2081
2	280 57 45.2	2 53 50.9	+12 16.7	−5 38 57.4	−12 32.3	9.658 5993	0.038 8253	0.041 4113

MERCURY.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth—	
								At Date.	At Interme diate Date
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr.	1	278 4 52.0	2 51 57.8	+12 36.2	−5 26 3.7	−13 14.6	9.660 8091	0.033 5594	0.036 20
	2	280 57 45.2	2 53 50.9	12 16.7	5 38 57.4	12 32.3	9.658 5993	0.038 8253	0.041 411
	3	283 52 38.5	2 55 58.0	11 49.3	5 51 7.5	11 47.4	9.656 1237	0.043 9661	0.046 48
	4	286 49 46.1	2 58 19.6	11 14.2	6 2 31.3	10 59.6	9.653 3814	0.048 9826	0.051 44
	5	289 49 22.7	3 0 56.1	10 31.3	6 13 5.7	10 8.6	9.650 3714	0.053 8756	0.056 2
	6	292 51 43.4	3 3 48.1	+ 9 40.8	−6 22 47.4	− 9 14.1	9.647 0931	0.058 6452	0.060 98
	7	295 57 4.1	3 6 56.2	8 42.8	6 31 32.6	8 15.7	9.643 5462	0.063 2911	0.065 56
	8	299 5 41.3	3 10 21.0	7 37.6	6 39 17.3	7 13.0	9.639 7306	0.067 8125	0.070 02
	9	302 17 51.9	3 14 3.1	6 25.6	6 45 57.1	6 5.7	9.635 6466	0.072 2079	0.074 357
	10	305 33 53.5	3 18 3.2	5 7.2	6 51 27.1	4 53.3	9.631 2953	0.076 4753	0.078 50
	11	308 54 4.6	3 22 22.2	+ 3 43.1	−6 55 41.9	− 3 35.3	9.626 6788	0.080 6121	0.082 63
	12	312 18 44.4	3 27 0.7	2 14.0	6 58 35.8	2 11.4	9.621 8001	0.084 6148	0.086 564
	13	315 48 12.7	3 31 59.3	+ 0 40.9	7 0 2.6	− 0 41.0	9.616 6634	0.088 4790	0.090 357
	14	319 22 50.0	3 37 18.8	− 0 55.1	6 59 55.4	+ 0 56.5	9.611 2745	0.092 1996	0.094 004
	15	323 2 57.4	3 42 59.8	2 32.7	6 58 7.0	2 41.5	9.605 6413	0.095 7703	0.097 497
	16	326 48 56.8	3 49 2.7	− 4 10.3	−6 54 29.8	+ 4 34.3	9.599 7740	0.099 1837	0.100 82
	17	330 41 10.2	3 55 27.9	5 46.1	6 48 55.7	6 35.4	9.593 6854	0.102 4318	0.103 99
	18	334 40 0.1	4 2 15.7	7 18.1	6 41 16.3	8 45.0	9.587 3914	0.105 5048	0.106 972
	19	338 45 49.1	4 9 26.0	8 44.0	6 31 22.9	11 3.2	9.580 9119	0.108 3917	0.109 761
	20	342 58 59.5	4 16 58.4	10 1.4	6 19 7.0	13 30.0	9.574 2712	0.111 0803	0.112 346
	21	347 19 53.0	4 24 52.1	−11 7.6	−6 4 20.0	+16 5.3	9.567 4982	0.113 5569	0.114 711
	22	351 48 50.3	4 33 5.7	11 59.9	5 46 53.9	18 48.2	9.560 6275	0.115 8062	0.116 840
	23	356 26 10.4	4 41 37.3	12 35.5	5 26 41.5	21 37.6	9.553 6999	0.117 8115	0.118 7171
	24	1 12 10.0	4 50 24.2	12 51.6	5 3 37.1	24 31.9	9.546 7630	0.119 5548	0.120 3221
	25	6 7 2.9	4 59 23.0	12 45.9	4 37 36.7	27 29.2	9.539 8714	0.121 0167	0.121 635
	26	11 10 58.7	5 8 29.2	−12 16.5	−4 8 38.7	+30 26.5	9.533 0868	0.122 1763	0.122 636
	27	16 24 2.0	5 17 37.2	11 22.2	3 36 44.9	33 20.2	9.526 4784	0.123 0119	0.123 3011
	28	21 46 11.5	5 26 40.3	10 2.6	3 2 1.0	36 6.1	9.520 1221	0.123 5007	0.123 607
	29	27 17 18.4	5 35 30.7	8 18.7	2 24 37.2	38 39.1	9.514 0994	0.123 6197	0.123 533
	30	32 57 5.7	5 43 59.5	6 12.7	1 44 49.0	40 53.7	9.508 4961	0.123 3462	0.123 055
May	1	38 45 7.0	5 51 57.1	− 3 48.6	−1 2 57.8	+42 44.1	9.503 4000	0.122 6583	0.122 152
	2	44 40 46.0	5 59 12.9	− 1 11.6	−0 19 30.7	44 4.6	9.498 8982	0.121 5347	0.120 803
	3	50 43 15.5	6 5 36.3	+ 1 31.6	+0 24 59.7	44 49.7	9.495 0735	0.119 9569	0.118 992
	4	56 51 37.8	6 10 56.9	4 13.2	1 9 55.6	44 55.1	9.492 0013	0.117 9092	0.116 705
	5	63 4 45.2	6 15 5.1	6 44.8	1 54 35.7	44 17.7	9.489 7453	0.115 3790	0.113 930
	6	69 21 21.1	6 17 52.6	+ 8 58.5	+2 38 16.4	+42 56.3	9.488 3542	0.112 3579	0.110 662
	7	75 40 1.5	6 19 13.4	10 46.7	3 20 13.9	40 51.8	9.487 8588	0.108 8423	0.106 899
	8	81 59 17.7	6 19 3.8	12 3.5	3 59 46.4	38 7.0	9.488 2703	0.104 8333	0.102 6454
	9	88 17 38.7	6 17 23.2	12 45.1	4 36 16.0	34 46.8	9.489 5794	0.100 3369	0.097 909
	10	94 33 34.5	6 14 14.0	12 49.7	5 9 10.4	30 57.7	9.491 7572	0.095 3640	0.092 7033
	11	100 45 38.7	6 9 41.1	+12 18.3	+5 38 4.5	+26 47.5	9.494 7563	0.089 9293	0.087 0443
	12	106 52 31.4	6 3 52.4	11 13.6	6 2 41.1	22 24.2	9.498 5142	0.084 0509	0.080 9520
	13	112 53 1.6	5 56 57.7	9 40.5	6 22 51.0	17 55.4	9.502 9566	0.077 7507	0.074 4499
	14	118 46 8.5	5 49 7.8	7 44.7	6 38 32.3	13 28.1	9.508 0012	0.071 0526	0.067 5620
	15	124 31 2.5	5 40 34.1	5 32.8	6 49 49.8	9 8.7	9.513 5613	0.063 9815	0.060 3142
	16	130 7 5.8	5 31 28.2	+ 3 11.6	+6 56 54.0	+ 5 2.2	9.519 5488	0.056 5636	0.052 7329
	17	135 33 51.8	5 22 1.2	+ 0 47.3	+6 59 59.6	+ 1 12.0	9.525 8777	0.048 8253	0.044 8440

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
ay 16	130 7 5.8	5 31 28.2	+ 3 11.6	+6 56 54.0	+ 5 2.2	9.519 5488	0.056 5636	0.052 7329
17	135 33 51.8	5 22 1.2	+ 0 47.3	6 59 59.6	+ 1 12.0	9.525 8777	0.048 8253	0.044 8440
18	140 51 4.4	5 12 23.0	− 1 34.4	6 59 24.2	− 2 19.4	9.532 4660	0.040 7923	0.036 6733
19	145 58 37.0	5 2 42.5	3 48.8	6 55 27.5	5 30.6	9.539 2373	0.032 4901	0.028 2458
20	150 56 31.0	4 53 7.1	5 52.2	6 48 29.8	8 21.3	9.546 1218	0.023 9433	0.019 5855
21	155 44 54.9	4 43 43.0	− 7 41.7	+6 38 51.5	−10 51.8	9.553 0570	0.015 1753	0.010 7154
22	160 24 2.4	4 34 35.1	9 15.5	6 26 52.5	13 3.0	9.559 9875	0.006 2086	0.001 6574
23	164 54 11.6	4 25 47.0	10 32.4	6 12 51.4	14 56.1	9.566 8653	9.997 0644	9.992 4321
24	169 15 43.8	4 17 21.4	11 32.2	5 57 5.7	16 32.5	9.573 6490	9.987 7630	9.983 0595
25	173 29 2.5	4 9 20.2	12 14.9	5 39 51.4	17 53.6	9.580 3033	9.978 3239	9.973 5586
26	177 34 32.5	4 1 44.3	−12 41.2	+5 21 23.0	−19 1.1	9.586 7988	9.968 7658	9.963 9477
27	181 32 39.6	3 54 34.2	12 51.9	5 1 53.3	19 56.4	9.593 1109	9.959 1066	9.954 2447
28	185 23 49.5	3 47 49.9	12 48.2	4 41 33.8	20 40.9	9.599 2193	9.949 3642	9.944 4672
29	189 8 28.0	3 41 31.4	12 31.2	4 20 34.7	21 16.0	9.605 1077	9.939 5560	9.934 6329
30	192 47 0.7	3 35 38.0	12 2.4	3 59 4.7	21 42.8	9.610 7630	9.929 7001	9.924 7597
31	196 19 52.1	3 30 8.8	−11 23.1	+3 37 11.5	−22 2.4	9.616 1748	9.919 8140	9.914 8654
une 1	199 47 26.2	3 25 3.2	10 34.6	3 15 2.0	22 15.8	9.621 3351	9.909 9162	9.904 9689
2	203 10 6.1	3 20 20.2	9 38.3	2 52 41.8	22 23.8	9.626 2380	9.900 0260	9.895 0900
3	206 28 13.8	3 15 58.8	8 35.4	2 30 15.9	22 27.2	9.630 8789	9.890 1637	9.885 2497
4	209 42 10.6	3 11 58.1	7 27.1	2 7 48.7	22 26.6	9.635 2548	9.880 3509	9.875 4702
5	212 52 16.6	3 8 17.2	− 6 14.6	+1 45 23.9	−22 22.6	9.639 3637	9.870 6108	9.865 7758
6	215 58 51.3	3 4 55.2	4 59.0	1 23 4.6	22 15.5	9.643 2043	9.860 9684	9.856 1922
7	219 2 13.1	3 1 51.3	3 41.2	1 0 53.7	22 5.9	9.646 7762	9.851 4509	9.846 7482
8	222 2 39.6	2 59 4.6	2 22.2	0 38 53.5	21 54.1	9.650 0794	9.842 0879	9.837 4741
9	225 0 27.7	2 56 34.4	− 1 2.7	+0 17 6.2	21 40.3	9.653 1140	9.832 9112	9.828 4035
10	227 55 53.6	2 54 20.0	+ 0 16.3	−0 4 26.5	−21 24.8	9.655 8809	9.823 9554	9.819 5718
11	230 49 12.7	2 52 20.8	1 34.2	0 25 42.9	21 7.8	9.658 3811	9.815 2578	9.811 0183
12	233 40 40.0	2 50 36.3	2 50.4	0 46 41.7	20 49.4	9.660 6155	9.806 8587	9.802 7843
13	236 30 29.9	2 49 5.9	4 4.1	1 7 21.5	20 29.8	9.662 5850	9.798 8008	9.794 9139
14	239 18 56.3	2 47 49.2	5 14.9	1 27 41.1	20 9.1	9.664 2906	9.791 1295	9.787 4537
15	242 6 12.7	2 46 45.8	+ 6 22.1	−1 47 39.4	−19 47.3	9.665 7332	9.783 8926	9.780 4525
16	244 52 32.2	2 45 55.4	7 25.4	2 7 15.3	19 24.4	9.666 9138	9.777 1397	9.773 9607
17	247 38 7.7	2 45 17.8	8 24.2	2 26 27.9	19 0.5	9.667 8330	9.770 9218	9.768 0294
18	250 23 11.9	2 44 52.7	9 18.1	2 45 16.0	18 35.5	9.668 4914	9.765 2899	9.762 7096
19	253 7 57.2	2 44 39.9	10 6.7	3 3 38.6	18 9.4	9.668 8895	9.760 2948	9.758 0515
20	255 52 35.8	2 44 39.4	+10 49.7	−3 21 34.6	−17 42.3	9.669 0275	9.755 9859	9.754 1037
21	258 37 20.0	2 44 51.1	11 26.7	3 39 2.9	17 14.1	9.668 9057	9.752 4103	9.750 9110
22	261 22 22.0	2 45 15.0	11 57.5	3 56 2.3	16 44.5	9.668 5238	9.749 6106	9.748 5136
23	264 7 54.1	2 45 51.2	12 21.7	4 12 31.4	16 13.5	9.667 8815	9.747 6243	9.746 9464
24	266 54 8.5	2 46 39.7	12 39.0	4 28 28.8	15 41.1	9.666 9785	9.746 4831	9.746 2373
25	269 41 17.6	2 47 40.7	+12 49.3	−4 43 53.0	−15 7.0	9.665 8142	9.746 2111	9.746 4062
26	272 29 34.1	2 48 54.5	12 52.3	4 58 42.3	14 31.2	9.664 3878	9.746 8238	9.747 4644
27	275 19 10.8	2 50 21.1	12 47.8	5 12 54.7	13 53.4	9.662 6986	9.748 3279	9.749 4138
28	278 10 20.7	2 52 1.0	12 35.7	5 26 28.2	13 13.4	9.660 7455	9.750 7208	9.752 2471
29	281 3 17.3	2 53 54.6	12 15.9	5 39 20.6	12 31.0	9.658 5275	9.753 9905	9.755 9482
30	283 58 14.5	2 56 2.1	+11 48.4	−5 51 29.3	−11 46.0	9.656 0438	9.758 1167	9.760 4921
July 1	286 55 26.4	2 58 24.1	+11 13.0	−6 2 51.6	−10 58.1	9.653 2935	9.763 0703	9.765 8464

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth—	
							At Date.	At Interme diate Date
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 1	286 55 26.4	2 58 24.1	+11 13.0	−6 2 51.6	−10 58.1	9.653 2935	9.763 0703	9.765 84
2	289 55 7.7	3 1 1.1	10 29.9	6 13 24.4	10 7.0	9.650 2756	9.768 8154	9.771 97
3	292 57 33.8	3 3 53.6	9 39.1	6 23 4.4	9 12.4	9.646 9892	9.775 3104	9.778 824
4	296 3 0.3	3 7 2.1	8 40.9	6 31 47.9	8 13.9	9.643 4341	9.782 5081	9.786 35
5	299 11 43.6	3 10 27.4	7 35.5	6 39 30.7	7 11.0	9.639 6102	9.790 3577	9.794 510
6	302 24 0.9	3 14 10.1	+ 6 23.3	−6 46 8.4	− 6 3.5	9.635 5179	9.798 8061	9.803 237
7	305 40 9.9	3 18 10.9	5 4.7	6 51 36.1	4 50.9	9.631 1585	9.807 7987	9.812 481
8	309 0 29.0	3 22 30.4	3 40.4	6 55 48.5	3 32.8	9.626 5339	9.817 2806	9.822 187
9	312 25 17.3	3 27 9.4	2 11.2	6 58 39.8	2 8.7	9.621 6473	9.827 1971	9.832 301
10	315 54 54.6	3 32 8.7	+ 0 38.0	7 0 3.8	− 0 38.0	9.616 5028	9.837 4948	9.842 770
11	319 29 41.6	3 37 28.9	− 0 58.1	−6 59 53.6	+ 0 59.7	9.611 1063	9.848 1212	9.853 541
12	323 9 59.5	3 43 10.5	2 35.7	6 58 2.0	2 44.8	9.605 4658	9.859 0261	9.864 567
13	326 56 9.9	3 49 14.0	4 13.2	6 54 21.3	4 37.8	9.599 5915	9.870 1612	9.875 800
14	330 48 35.0	3 55 40.0	5 49.0	6 48 43.5	6 39.2	9.593 4963	9.881 4801	9.887 194
15	334 47 37.4	4 2 28.6	7 20.8	6 41 0.1	8 49.1	9.587 1963	9.892 9385	9.898 706
16	338 53 39.6	4 9 39.5	− 8 46.5	−6 31 2.5	+11 7.6	9.580 7115	9.904 4940	9.910 295
17	343 7 3.8	4 17 12.5	10 3.6	6 18 42.0	13 34.7	9.574 0661	9.916 1057	9.921 92
18	347 28 11.7	4 25 6.8	11 9.5	6 3 50.2	16 10.2	9.567 2895	9.927 7341	9.933 542
19	351 57 24.1	4 33 21.0	12 1.3	5 46 19.1	18 53.2	9.560 4164	9.939 3411	9.945 124
20	356 34 59.8	4 41 53.2	12 36.3	5 26 1.6	21 42.8	9.553 4877	9.950 8892	9.956 629
21	1 21 15.5	4 50 40.7	−12 51.8	−5 2 51.9	+24 37.4	9.546 5512	9.962 3414	9.968 020
22	6 16 24.8	4 59 39.8	12 45.4	4 36 46.0	27 34.7	9.539 6618	9.973 6613	9.979 260
23	11 20 37.3	5 8 46.0	12 15.2	4 7 42.6	30 31.9	9.532 8815	9.984 8124	9.990 3134
24	16 33 57.4	5 17 53.8	11 20.1	3 35 43.5	33 25.4	9.526 2797	9.995 7586	0.001 1436
25	21 56 23.4	5 26 56.7	9 59.7	3 0 54.4	36 10.9	9.519 9323	0.006 4639	0.011 7148
26	27 27 46.5	5 35 46.6	− 8 15.1	−2 23 25.9	+38 43.4	9.513 9211	0.016 8920	0.021 9910
27	33 7 49.4	5 44 14.7	6 8.5	1 43 33.7	40 57.4	9.508 3319	0.027 0074	0.031 9369
28	38 56 5.4	5 52 11.2	3 43.9	1 1 39.1	42 47.0	9.503 2526	0.036 7753	0.041 5184
29	44 51 57.7	5 59 25.6	− 1 6.6	−0 18 9.5	44 6.5	9.498 7702	0.046 1623	0.050 7030
30	50 54 38.9	6 5 47.2	+ 1 36.6	+0 26 22.2	44 50.5	9.494 9675	0.055 1367	0.059 4590
31	57 3 11.0	6 11 5.7	+ 4 18.0	+1 11 18.3	+44 54.6	9.491 9193	0.063 6693	0.067 7619
Aug. 1	63 16 26.0	6 15 11.5	6 49.2	1 55 57.3	44 15.9	9.489 6888	0.071 7348	0.075 5854
2	69 33 7.1	6 17 56.5	9 2.2	2 39 35.5	42 53.1	9.488 3245	0.079 3115	0.082 9111
3	75 51 50.1	6 19 14.6	10 49.5	3 21 29.2	40 47.2	9.487 8568	0.086 3826	0.089 7246
4	82 11 6.1	6 19 2.2	12 5.3	4 0 56.6	38 1.2	9.488 2960	0.092 9362	0.096 0167
5	88 29 24.1	6 17 18.8	+12 45.8	+4 37 19.9	+34 40.1	9.489 6322	0.098 9659	0.101 7838
6	94 45 14.2	6 14 6.8	12 49.3	5 10 7.3	30 50.4	9.491 8358	0.104 4707	0.107 0274
7	100 57 10.1	6 9 31.6	12 16.8	5 38 53.8	26 39.7	9.494 8592	0.109 4550	0.111 7546
8	107 3 52.3	6 3 40.8	11 11.2	6 3 22.4	22 16.0	9.498 6393	0.113 9277	0.115 9762
9	113 4 9.8	5 56 44.2	9 37.2	6 23 24.0	17 47.1	9.503 1016	0.117 9021	0.119 7074
10	118 57 2.3	5 48 52.7	+ 7 40.8	+6 38 57.1	+13 20.0	9.508 1634	0.121 3946	0.122 9663
11	124 41 40.8	5 40 17.9	5 28.6	6 50 6.6	9 0.9	9.513 7378	0.124 4250	0.125 7735
12	130 17 27.5	5 31 11.2	3 7.2	6 57 3.2	4 54.8	9.519 7370	0.127 0146	0.128 1511
13	135 43 56.2	5 21 43.7	+ 0 42.9	7 0 1.7	+ 1 5.2	9.526 0750	0.129 1859	0.130 1219
14	141 0 51.2	5 12 5.3	− 1 38.7	6 59 19.9	− 2 25.6	9.532 6700	0.130 9621	0.131 7093
15	146 8 6.0	5 2 24.8	− 3 52.8	+6 55 17.3	− 5 36.2	9.539 4460	0.132 3665	0.132 9365
16	151 5 42.4	4 52 49.6	− 5 55.8	+6 48 14.3	− 8 26.3	9.546 3330	0.133 4221	0.133 8259

MERCURY.

GREENWICH MEAN NOON.

ate.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
g. 16	151 5 42.4	4 52 49.6	− 5 55.8	+6 48 14.3	− 8 26.3	9.546 3330	0.133 4221	0.133 8259
17	155 53 49.1	4 43 26.0	7 44.8	6 38 31.4	10 56.2	9.553 2689	0.134 1506	0.134 3987
18	160 32 39.9	4 34 18.7	9 18.1	6 26 28.3	13 6.9	9.560 1986	0.134 5728	0.134 6754
19	165 2 33.0	4 25 31.2	10 34.5	6 12 23.7	14 59.4	9.567 0742	0.134 7087	0.134 6751
20	169 23 49.7	4 17 6.3	11 33.8	5 56 35.1	16 35.2	9.573 8545	0.134 5766	0.134 4152
21	173 36 53.7	4 9 5.8	−12 16.0	+5 39 18.3	−17 55.9	9.580 5045	0.134 1929	0.133 9118
22	177 42 9.8	4 1 30.6	12 41.8	5 20 47.8	19 3.0	9.586 9949	0.133 5736	0.133 1799
23	181 40 3.6	3 54 21.4	12 52.0	5 1 16.4	19 58.0	9.593 3010	0.132 7323	0.132 2325
24	185 31 1.2	3 47 38.0	12 47.9	4 40 55.5	20 42.1	9.599 4029	0.131 6817	0.131 0814
25	189 15 28.2	3 41 20.2	12 30.5	4 19 55.3	21 16.8	9.605 2844	0.130 4329	0.129 7374
26	192 53 50.0	3 35 27.5	−12 1.3	+3 58 24.5	−21 43.4	9.610 9324	0.128 9960	0.128 2097
27	196 26 31.3	3 29 59.2	11 21.7	3 36 30.7	22 2.9	9.616 3366	0.127 3795	0.126 5064
28	199 53 56.1	3 24 54.3	10 32.9	3 14 20.8	22 16.1	9.621 4893	0.125 5911	0.124 6345
29	203 16 27.3	3 20 11.9	9 36.4	2 52 0.3	22 24.0	9.626 3843	0.123 6373	0.122 6002
30	206 34 27.0	3 15 51.1	8 33.3	2 29 34.3	22 27.3	9.631 0172	0.121 5236	0.120 4083
31	209 48 16.4	3 11 51.0	− 7 24.9	+2 7 7.1	−22 26.5	9.635 3850	0.119 2546	0.118 0631
pt. 1	212 58 15.6	3 8 10.7	6 12.3	1 44 42.4	22 22.3	9.639 4856	0.116 8340	0.115 5678
2	216 4 44.1	3 4 49.3	4 56.6	1 22 23.4	22 15.2	9.643 3179	0.114 2647	0.112 9250
3	219 8 0.2	3 1 45.9	3 38.8	1 0 12.8	22 5.6	9.646 8815	0.111 5489	0.110 1366
4	222 8 21.6	2 58 59.7	2 19.7	0 38 13.0	21 53.7	9.650 1764	0.108 6882	0.107 2039
5	225 6 5.1	2 56 30.0	− 1 0.3	+0 16 26.0	−21 39.9	9.653 2028	0.105 6836	0.104 1273
6	228 1 26.8	2 54 16.1	+ 0 18.7	−0 5 6.2	21 24.3	9.655 9617	0.102 5350	0.100 9067
7	230 54 42.3	2 52 17.4	1 36.6	0 26 22.1	21 7.2	9.658 4538	0.099 2422	0.097 5414
8	233 46 6.4	2 50 33.3	2 52.7	0 47 20.3	20 48.8	9.660 6799	0.095 8042	0.094 0304
9	236 35 53.5	2 49 3.3	4 6.4	1 7 59.4	20 29.2	9.662 6413	0.092 2197	0.090 3719
10	239 24 17.5	2 47 47.0	+ 5 17.0	−1 28 18.3	−20 8.5	9.664 3388	0.088 4867	0.086 5638
11	242 11 31.9	2 46 44.0	6 24.1	1 48 16.0	19 46.7	9.665 7733	0.084 6029	0.082 6036
12	244 57 49.9	2 45 54.1	7 27.2	2 7 51.3	19 23.7	9.666 9458	0.080 5656	0.078 4884
13	247 43 24.3	2 45 16.8	8 25.9	2 27 3.1	18 59.7	9.667 8570	0.076 3715	0.074 2146
14	250 28 27.7	2 44 52.0	9 19.6	2 45 50.4	18 34.7	9.668 5075	0.072 0171	0.069 7786
15	253 13 12.5	2 44 39.7	+10 8.1	−3 4 12.2	−18 8.7	9.668 8975	0.067 4985	0.065 1763
16	255 57 51.1	2 44 39.6	10 50.9	3 22 7.4	17 41.6	9.669 0275	0.062 8115	0.060 4034
17	258 42 35.7	2 44 51.6	11 27.8	3 39 34.9	17 13.2	9.668 8976	0.057 9515	0.055 4551
18	261 27 38.4	2 45 15.9	11 58.3	3 56 33.4	16 43.5	9.668 5075	0.052 9136	0.050 3264
19	264 13 11.6	2 45 52.5	12 22.3	4 13 1.5	16 12.5	9.667 8571	0.047 6928	0.045 0121
20	266 59 27.5	2 46 41.4	+12 39.4	−4 28 57.9	−15 40.0	9.666 9461	0.042 2837	0.039 5068
21	269 46 38.5	2 47 42.8	12 49.5	4 44 21.0	15 5.9	9.665 7736	0.036 6808	0.033 8049
22	272 34 57.3	2 48 57.0	12 52.2	4 59 9.1	14 30.0	9.664 3389	0.030 8784	0.027 9006
23	275 24 36.7	2 50 24.0	12 47.5	5 13 20.4	13 52.2	9.662 6415	0.024 8708	0.021 7883
24	278 15 49.7	2 52 4.3	12 35.2	5 26 52.7	13 12.1	9.660 6803	0.018 6524	0.015 4625
25	281 8 49.8	2 53 58.3	+12 15.2	−5 39 43.8	−12 29.6	9.658 4542	0.012 2178	0.008 9177
26	284 3 50.9	2 56 6.3	11 47.3	5 51 51.1	11 44.5	9.655 9622	0.005 5617	0.002 1491
27	287 1 7.3	2 58 28.8	11 11.8	6 3 11.9	10 56.6	9.653 2034	9.998 6794	9.995 1522
28	290 0 53.5	3 1 6.2	10 28.4	6 13 43.2	10 5.4	9.650 1770	9.991 5671	9.987 9236
29	293 3 24.9	3 3 59.2	9 37.4	6 23 21.5	9 10.6	9.646 8822	9.984 2217	9.980 4613
30	296 8 57.3	3 7 8.2	+ 8 39.0	−6 32 3.1	− 8 11.9	9.643 3186	9.976 6423	9.972 7647
Oct. 1	299 17 47.0	3 10 34.0	+ 7 33.4	−6 39 44.0	− 7 9.0	9.639 4862	9.968 8289	9.964 8354

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fro Earth—	
							At Date.	At Interm diate Dat
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 1	299 17 47.0	3 10 34.0	+ 7 33.4	−6 39 44.0	− 7 9.0	9.639 4862	9.968 8289	9.964 83
2	302 30 11.2	3 14 17.2	6 20.9	6 46 19.6	6 1.4	9.635 3857	9.960 7848	9.956 677
3	305 46 27.7	3 18 18.6	5 2.2	6 51 45.1	4 48.6	9.631 0180	9.952 5156	9.948 299
4	309 6 54.9	3 22 38.8	3 37.7	6 55 55.1	3 30.3	9.626 3851	9.944 0318	9.939 713
5	312 31 51.9	3 27 18.5	2 8.4	6 58 43.8	2 6.0	9.621 4902	9.935 3485	9.930 938
6	316 1 38.6	3 32 18.4	+ 0 35.0	−7 0 4.9	− 0 35.1	9.616 3377	9.926 4869	9.921 907
7	319 36 35.6	3 37 39.2	− 1 1.1	6 59 51.7	+ 1 2.8	9.610 9334	9.917 4756	9.912 925
8	323 17 4.2	3 43 21.5	2 38.7	6 57 56.9	2 48.2	9.605 2853	9.908 3530	9.903 765
9	327 3 26.0	3 49 25.8	4 16.2	6 54 12.7	4 41.5	9.599 4038	9.899 1686	9.894 572
10	330 56 3.2	3 55 52.4	5 51.9	6 48 31.1	6 43.1	9.593 3019	9.889 9848	9.885 417
11	334 55 18.4	4 2 41.7	− 7 23.6	−6 40 43.7	+ 8 53.3	9.586 9958	9.880 8799	9.876 386
12	339 1 34.1	4 9 53.4	8 49.1	6 30 41.8	11 12.1	9.580 5054	9.871 9489	9.867 583
13	343 15 12.5	4 17 27.1	10 5.9	6 18 16.7	13 39.5	9.573 8553	9.863 3065	9.859 134
14	347 36 35.4	4 25 22.0	11 11.3	6 3 20.1	16 15.1	9.567 0750	9.855 0875	9.851 184
15	352 6 3.2	4 33 36.8	12 2.6	5 45 43.9	18 58.4	9.560 1994	9.847 4470	9.843 897
16	356 43 55.0	4 42 9.5	−12 37.1	−5 25 21.1	+21 48.2	9.553 2696	9.840 5584	9.837 454
17	1 30 27.3	4 50 57.4	12 51.9	5 2 5.9	24 42.9	9.546 3337	9.834 6094	9.832 048
18	6 25 53.6	4 59 56.8	12 44.8	4 35 54.5	27 40.2	9.539 4467	9.829 7951	9.827 874
19	11 30 23.2	5 9 3.3	12 13.9	4 6 45.6	30 37.3	9.532 6708	9.826 3085	9.825 119
20	16 44 0.6	5 18 11.1	11 18.0	3 34 41.1	33 30.7	9.526 0757	9.824 3275	9.823 040
21	22 6 43.7	5 27 13.6	− 9 56.9	−2 59 46.9	+36 15.9	9.519 7376	9.824 0013	9.824 4938
22	27 38 23.5	5 36 3.0	8 11.5	2 22 13.6	38 47.9	9.513 7382	9.825 4357	9.826 8316
23	33 18 42.3	5 44 30.3	6 4.3	1 42 17.2	41 1.3	9.508 1636	9.828 6820	9.830 983
24	39 7 13.3	5 52 25.6	3 39.2	1 0 19.2	42 50.1	9.503 1017	9.833 7284	9.836 905
25	45 3 19.3	5 59 38.4	− 1 1.6	−0 16 47.1	44 8.5	9.498 6393	9.840 4986	9.844 490
26	51 6 12.5	6 5 58.2	+ 1 41.7	+0 27 46.0	+44 51.3	9.494 8591	9.848 8575	9.853 5765
27	57 14 54.7	6 11 14.6	4 22.9	1 12 42.2	44 54.1	9.491 8357	9.858 6202	9.863 960
28	63 28 17.5	6 15 18.0	6 53.7	1 57 19.9	44 14.0	9.489 6319	9.869 5670	9.875 410
29	69 45 3.7	6 18 0.2	9 6.0	2 40 55.6	42 49.8	9.488 2955	9.881 4594	9.887 684
30	76 3 49.1	6 19 15.3	10 52.4	3 22 45.3	40 42.6	9.487 8562	9.894 0549	9.900 5426
31	82 23 4.6	6 19 0.1	+12 7.1	+4 2 7.5	+37 55.4	9.488 3240	9.907 1196	9.913 7598
Nov. 1	88 41 19.4	6 17 14.0	12 46.4	4 38 24.6	34 33.3	9.489 6881	9.920 4387	9.927 1334
2	94 57 3.4	6 13 59.3	12 48.8	5 11 4.8	30 42.9	9.491 9182	9.933 8228	9.940 4876
3	101 8 50.7	6 9 21.6	12 15.2	5 39 43.5	26 31.7	9.494 9663	9.947 1104	9.953 6756
4	107 15 21.9	6 3 28.7	11 8.6	6 4 3.9	22 7.6	9.498 7690	9.960 1693	9.966 5793
5	113 15 26.4	5 56 30.2	+ 9 33.9	+6 23 57.1	+17 38.6	9.503 2514	9.972 8951	9.979 1076
6	119 8 4.1	5 48 37.1	7 36.9	6 39 21.8	13 11.8	9.508 3307	9.985 2092	9.991 1934
7	124 52 26.3	5 40 1.1	5 24.3	6 50 23.3	8 53.1	9.513 9198	9.997 0549	0.002 7895
8	130 27 55.8	5 30 53.6	3 2.7	6 57 12.3	4 47.4	9.519 9310	0.008 3942	0.013 8667
9	135 54 6.7	5 21 25.6	+ 0 38.4	7 0 3.6	+ 0 58.3	9.526 2784	0.019 2056	0.024 4100
10	141 10 43.4	5 11 47.0	− 1 43.0	+6 59 15.2	− 2 31.8	9.532 8803	0.029 4796	0.034 4147
11	146 17 40.0	5 2 6.6	3 56.8	6 55 6.7	5 41.7	9.539 6606	0.039 2161	0.043 8849
12	151 14 58.5	4 52 31.8	5 59.4	6 47 58.5	8 31.2	9.546 5500	0.048 4227	0.052 8313
13	156 2 47.5	4 43 8.6	7 48.0	6 38 11.0	11 0.6	9.553 4864	0.057 1125	0.061 2686
14	160 41 21.1	4 34 1.7	9 20.7	6 26 3.8	13 10.6	9.560 4151	0.065 3019	0.069 2149
15	165 10 57.6	4 25 14.9	−10 36.6	+6 11 55.8	−15 2.5	9.567 2884	0.073 0100	0.076 6898
16	169 31 58.5	4 16 50.9	−11 35.3	+5 56 4.2	−16 37.9	9.574 0652	0.080 2570	0.083 7142

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
v. 16	169 31 58.5	4 16 50.9	−11 35.3	+5 56 4.2	−16 37.9	9.574 0652	0.080 2570	0.083 7142
17	173 44 47.5	4 8 51.2	12 17.0	5 38 44.9	17 58.2	9.580 7106	0.087 0640	0.090 3091
18	177 49 49.4	4 1 16.8	12 42.3	5 20 12.3	19 4.9	9.587 1954	0.093 4522	0.096 4958
19	181 47 29.8	3 54 8.3	12 52.1	5 0 39.2	19 59.4	9.593 4954	0.099 4423	0.102 2943
20	185 38 14.7	3 47 25.7	12 47.5	4 40 17.0	20 43.3	9.599 5906	0.105 0543	0.107 7246
21	189 22 29.9	3 41 8.8	−12 29.8	+4 19 15.7	−21 17.9	9.605 4650	0.110 3075	0.112 8052
22	193 0 40.7	3 35 16.9	12 0.3	3 57 44.0	21 44.2	9.611 1056	0.115 2200	0.117 5540
23	196 33 11.8	3 29 49.2	11 20.3	3 35 49.7	22 3.3	9.616 5021	0.119 8093	0.121 9878
24	200 0 27.0	3 24 45.0	10 31.3	3 13 39.4	22 16.4	9.621 6466	0.124 0912	0.126 1216
25	203 22 49.4	3 20 3.3	9 34.6	2 51 18.7	22 24.2	9.626 5333	0.128 0807	0.129 9703
26	206 40 40.9	3 15 43.2	− 8 31.3	+2 28 52.6	−22 27.3	9.631 1580	0.131 7920	0.133 5472
27	209 54 22.8	3 11 43.8	7 22.7	2 6 25.5	22 26.4	9.635 5175	0.135 2374	0.136 8641
28	213 4 15.2	3 8 4.2	6 10.0	1 44 0.9	22 22.2	9.639 6097	0.138 4288	0.139 9328
29	216 10 37.4	3 4 43.3	4 54.2	1 21 42.1	22 15.0	9.643 4336	0.141 3773	0.142 7636
30	219 13 47.8	3 1 40.4	3 36.4	0 59 31.8	22 5.2	9.646 9887	0.144 0928	0.145 3659
ec. 1	222 14 4.0	2 58 54.7	− 2 17.3	+0 37 32.4	−21 53.3	9.650 2751	0.146 5839	0.147 7480
2	225 11 42.8	2 56 25.5	− 0 57.8	+0 15 45.9	21 39.5	9.653 2932	0.148 8591	0.149 9181
3	228 7 0.3	2 54 12.1	+ 0 21.2	−0 5 45.9	21 23.9	9.656 0437	0.150 9257	0.151 8828
4	231 0 12.1	2 52 13.9	1 39.0	0 27 1.3	21 6.7	9.658 5275	0.152 7900	0.153 6482
5	233 51 33.0	2 50 30.3	2 55.0	0 47 58.9	20 48.2	9.660 7454	0.154 4580	0.155 2202
6	236 41 17.3	2 49 0.7	+ 4 8.6	−1 8 37.4	−20 28.6	9.662 6984	0.155 9352	0.156 6037
7	239 29 38.9	2 47 44.8	5 19.1	1 28 55.7	20 7.8	9.664 3876	0.157 2261	0.157 8030
8	242 16 51.4	2 46 42.2	6 26.1	1 48 52.7	19 45.9	9.665 8141	0.158 3347	0.158 8217
9	245 3 7.8	2 45 52.7	7 29.1	2 8 27.2	19 23.0	9.666 9785	0.159 2644	0.159 6631
10	247 48 41.0	2 45 15.9	8 27.6	2 27 38.3	18 59.0	9.667 8815	0.160 0180	0.160 3295
11	250 33 43.7	2 44 51.5	+ 9 21.2	−2 46 24.9	−18 33.9	9.668 5237	0.160 5979	0.160 8234
12	253 18 28.2	2 44 39.5	10 9.5	3 4 45.9	18 7.8	9.668 9057	0.161 0061	0.161 1462
13	256 3 6.8	2 44 39.7	10 52.2	3 22 40.2	17 40.6	9.669 0275	0.161 2437	0.161 2988
14	258 47 51.8	2 44 52.2	11 28.8	3 40 6.8	17 12.3	9.668 8894	0.161 3114	0.161 2816
15	261 32 55.3	2 45 16.9	11 59.2	3 57 4.3	16 42.7	9.668 4913	0.161 2094	0.161 0948
16	264 18 29.6	2 45 53.8	+12 23.0	−4 13 31.5	−16 11.6	9.667 8329	0.160 9376	0.160 7377
17	267 4 47.0	2 46 43.1	12 39.9	4 29 26.9	15 39.0	9.666 9138	0.160 4948	0.160 2089
18	269 52 0.0	2 47 44.9	12 49.7	4 44 49.0	15 4.8	9.665 7332	0.159 8796	0.159 5068
19	272 40 21.1	2 48 59.4	12 52.2	4 59 36.0	14 28.9	9.664 2903	0.159 0901	0.158 6292
20	275 30 3.1	2 50 26.9	12 47.3	5 13 46.1	13 51.0	9.662 5846	0.158 1237	0.157 5732
21	278 21 19.3	2 52 7.7	+12 34.7	−5 27 17.2	−13 10.8	9.660 6151	0.156 9772	0.156 3353
22	281 14 23.0	2 54 2.1	12 14.5	5 40 7.0	12 28.3	9.658 3807	0.155 6468	0.154 9113
23	284 9 28.1	2 56 10.5	11 46.4	5 52 12.9	11 43.1	9.655 8805	0.154 1281	0.153 2965
24	287 6 48.9	2 58 33.5	11 10.6	6 3 32.2	10 55.0	9.653 1134	0.152 4158	0.151 4853
25	290 6 40.1	3 1 11.4	10 27.0	6 14 1.9	10 3.7	9.650 0786	0.150 5043	0.149 4719
26	293 9 16.9	3 4 4.8	+ 9 35.8	−6 23 38.5	− 9 8.8	9.646 7754	0.148 3871	0.147 2490
27	296 14 55.2	3 7 14.4	8 37.1	6 32 18.3	8 10.0	9.643 2035	0.146 0566	0.144 8089
28	299 23 51.4	3 10 40.8	7 31.2	6 39 57.2	7 7.0	9.639 3628	0.143 5047	0.142 1430
29	302 36 22.6	3 14 24.6	6 18.6	6 46 30.7	5 59.3	9.635 2539	0.140 7224	0.139 2417
30	305 52 46.6	3 18 26.5	4 59.6	6 51 54.0	4 46.4	9.630 8779	0.137 6995	0.136 0945
31	309 13 21.9	3 22 47.3	+ 3 35.0	−6 56 1.6	− 3 27.9	9.626 2369	0.134 4252	0.132 6900
32	312 38 27.7	3 27 27.6	+ 2 5.5	−6 58 47.7	− 2 3.3	9.621 3339	0.130 8872	0.129 0153

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth—	
							At Date.	At Inter diate Da
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 0	119 14 43.4	1 37 24.9	+3 0.7	+2 19 49.2	+4 11.7	9.856 4263	9.600 1254	9.607 26
2	122 29 35.2	1 37 26.8	3 0.7	2 27 58.9	3 57.9	9.856 3991	9.614 3728	9.621 44
4	125 44 30.6	1 37 28.4	2 58.4	2 35 40.2	3 43.3	9.856 3812	9.628 4648	9.635 44
6	128 59 29.0	1 37 29.8	2 53.8	2 42 51.5	3 27.9	9.856 3728	9.642 3679	9.649 24
8	132 14 29.8	1 37 30.9	2 47.0	2 49 31.5	3 11.8	9.856 3738	9.656 0556	9.662 81
10	135 29 32.5	1 37 31.7	+2 38.0	+2 55 38.8	+2 55.2	9.856 3842	9.669 5082	9.676 14
12	138 44 36.3	1 37 32.1	2 27.0	3 1 12.2	2 38.0	9.856 4041	9.682 7116	9.689 21
14	141 59 40.7	1 37 32.2	2 14.1	3 6 10.6	2 20.3	9.856 4333	9.695 6565	9.702 03
16	145 14 45.0	1 37 32.0	1 59.5	3 10 33.1	2 2.1	9.856 4717	9.708 3384	9.714 58
18	148 29 48.5	1 37 31.4	1 43.3	3 14 18.8	1 43.5	9.856 5193	9.720 7565	9.726 86
20	151 44 50.6	1 37 30.5	+1 25.8	+3 17 27.0	+1 24.6	9.856 5758	9.732 9125	9.738 89
22	154 59 50.4	1 37 29.2	1 7.4	3 19 57.1	1 5.4	9.856 6410	9.744 8091	9.750 66
24	158 14 47.4	1 37 27.6	0 47.8	3 21 48.7	0 46.1	9.856 7148	9.756 4493	9.762 17
26	161 29 40.8	1 37 25.6	0 27.8	3 23 1.5	0 26.6	9.856 7970	9.767 8372	9.773 43
28	164 44 29.9	1 37 23.3	+0 7.4	3 23 35.2	+0 7.1	9.856 8871	9.778 9772	9.784 45
30	167 59 14.0	1 37 20.7	−0 13.1	+3 23 29.8	−0 12.5	9.856 9849	9.789 8735	9.795 23
Feb. 1	171 13 52.6	1 37 17.7	0 33.4	3 22 45.3	0 32.0	9.857 0902	9.800 5306	9.805 77
3	174 28 24.8	1 37 14.4	0 53.2	3 21 22.0	0 51.3	9.857 2025	9.810 9526	9.816 07
5	177 42 50.1	1 37 10.8	1 12.4	3 19 20.2	1 10.4	9.857 3215	9.821 1434	9.826 15
7	180 57 7.9	1 37 6.9	1 30.6	3 16 40.3	1 29.3	9.857 4469	9.831 1070	9.836 00
9	184 11 17.7	1 37 2.8	−1 47.7	+3 13 23.0	−1 47.9	9.857 5782	9.840 8482	9.845 63
11	187 25 18.9	1 36 58.4	2 3.4	3 9 28.9	2 6.1	9.857 7149	9.850 3725	9.855 05
13	190 39 11.1	1 36 53.7	2 17.5	3 4 58.8	2 23.8	9.857 8566	9.859 6859	9.864 26
15	193 52 53.8	1 36 48.9	2 29.9	2 59 53.8	2 41.1	9.858 0030	9.868 7949	9.873 2749
17	197 6 26.7	1 36 43.9	2 40.3	2 54 14.8	2 57.8	9.858 1534	9.877 7064	9.882 0902
19	200 19 49.4	1 36 38.8	−2 48.7	+2 48 3.0	−3 13.9	9.858 3074	9.886 4273	9.890 7183
21	203 33 1.7	1 36 33.5	2 55.0	2 41 19.7	3 29.3	9.858 4645	9.894 9641	9.899 1653
23	206 46 3.3	1 36 28.1	2 59.1	2 34 6.2	3 44.0	9.858 6243	9.903 3227	9.907 4369
25	209 58 54.1	1 36 22.7	3 0.9	2 26 23.9	3 58.1	9.858 7862	9.911 5087	9.915 5386
27	213 11 33.9	1 36 17.2	3 0.5	2 18 14.4	4 11.3	9.858 9496	9.919 5273	9.923 4754
Mar. 1	216 24 2.7	1 36 11.7	−2 57.8	+2 9 39.3	−4 23.7	9.859 1142	9.927 3833	9.931 2516
3	219 36 20.5	1 36 6.2	2 52.8	2 0 40.3	4 35.2	9.859 2793	9.935 0806	9.938 8707
5	222 48 27.4	1 36 0.7	2 45.7	1 51 19.1	4 45.9	9.859 4444	9.942 6224	9.946 3359
7	226 0 23.5	1 35 55.4	2 36.6	1 41 37.5	4 55.6	9.859 6091	9.950 0116	9.953 6500
9	229 12 9.0	1 35 50.1	2 25.5	1 31 37.3	5 4.4	9.859 7727	9.957 2513	9.960 8160
11	232 23 44.0	1 35 44.9	−2 12.6	+1 21 20.5	−5 12.2	9.859 9349	9.964 3445	9.967 8373
13	235 35 8.8	1 35 39.9	1 58.0	1 10 49.2	5 19.0	9.860 0950	9.971 2949	9.974 7178
15	238 46 23.7	1 35 35.1	1 42.0	1 0 5.1	5 24.9	9.860 2527	9.978 1066	9.981 4616
17	241 57 29.2	1 35 30.4	1 24.8	0 49 10.3	5 29.7	9.860 4074	9.984 7835	9.988 0728
19	245 8 25.5	1 35 25.9	1 6.6	0 38 6.9	5 33.5	9.860 5586	9.991 3300	9.994 5555
21	248 19 13.1	1 35 21.7	−0 47.5	+0 26 56.9	−5 36.3	9.860 7059	9.997 7498	0.000 9134
23	251 29 52.5	1 35 17.7	0 27.8	0 15 42.3	5 38.1	9.860 8489	0.004 0469	0.007 1507
25	254 40 24.1	1 35 14.0	−0 7.8	+0 4 25.3	5 38.8	9.860 9870	0.010 2252	0.013 2708
27	257 50 48.6	1 35 10.5	+0 12.2	−0 6 52.1	5 38.5	9.861 1199	0.016 2879	0.019 2768
29	261 1 6.3	1 35 7.3	0 32.1	0 18 7.8	5 37.1	9.861 2472	0.022 2377	0.025 1711
31	264 11 17.9	1 35 4.4	+0 51.6	−0 29 19.8	−5 34.7	9.861 3685	0.028 0773	0.030 9564
Apr. 2	267 21 23.8	1 35 1.7	+1 10.4	−0 40 26.1	−5 31.4	9.861 4835	0.033 8087	0.036 6342

VENUS.

GREENWICH MEAN NOON.

ate.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
r. 2	267 21 23.8	1 35 1.7	+1 10.4	−0 40 26.1	−5 31.4	9.861 4835	0.033 8087	0.036 6342
4	270 31 24.8	1 34 59.4	1 28.4	0 51 24.6	5 27.0	9.861 5917	0.039 4331	0.042 2055
6	273 41 21.4	1 34 57.4	1 45.3	1 2 13.3	5 21.6	9.861 6929	0.044 9516	0.047 6716
8	276 51 14.2	1 34 55.6	2 0.9	1 12 50.4	5 15.3	9.861 7868	0.050 3656	0.053 0338
10	280 1 3.7	1 34 54.1	2 15.0	1 23 14.0	5 8.1	9.861 8731	0.055 6765	0.058 2938
12	283 10 50.5	1 34 52.9	+2 27.5	−1 33 22.0	−4 59.9	9.861 9515	0.060 8862	0.063 4537
14	286 20 35.2	1 34 52.0	2 38.2	1 43 12.8	4 50.8	9.862 0218	0.065 9967	0.068 5156
16	289 30 18.4	1 34 51.4	2 46.9	1 52 44.6	4 40.9	9.862 0838	0.071 0104	0.073 4815
18	292 40 0.6	1 34 51.0	2 53.6	2 1 55.7	4 30.1	9.862 1374	0.075 9292	0.078 3539
20	295 49 42.4	1 34 50.9	2 58.2	2 10 44.4	4 18.5	9.862 1823	0.080 7558	0.083 1351
22	298 59 24.2	1 34 51.0	+3 0.6	−2 19 9.1	−4 6.1	9.862 2184	0.085 4920	0.087 8269
24	302 9 6.5	1 34 51.4	3 0.8	2 27 8.4	3 53.0	9.862 2457	0.090 1400	0.092 4315
26	305 18 49.8	1 34 52.0	2 58.9	2 34 40.8	3 39.2	9.862 2640	0.094 7016	0.096 9505
28	308 28 34.6	1 34 52.9	2 54.7	2 41 44.9	3 24.8	9.862 2733	0.099 1785	0.101 3856
30	311 38 21.3	1 34 53.9	2 48.4	2 48 19.5	3 9.7	9.862 2736	0.103 5719	0.105 7375
ay 2	314 48 10.3	1 34 55.1	+2 40.1	−2 54 23.4	−2 54.1	9.862 2649	0.107 8824	0.110 0065
4	317 58 1.8	1 34 56.5	2 29.8	2 59 55.4	2 37.9	9.862 2472	0.112 1099	0.114 1928
6	321 7 56.4	1 34 58.1	2 17.7	3 4 54.6	2 21.3	9.862 2205	0.116 2551	0.118 2968
8	324 17 54.3	1 34 59.8	2 3.9	3 9 20.1	2 4.2	9.862 1849	0.120 3179	0.122 3186
10	327 27 55.8	1 35 1.7	1 48.6	3 13 11.0	1 46.7	9.862 1406	0.124 2990	0.126 2592
12	330 38 1.2	1 35 3.7	+1 32.0	−3 16 26.6	−1 28.9	9.862 0876	0.128 1994	0.130 1195
14	333 48 10.7	1 35 5.8	1 14.2	3 19 6.3	1 10.8	9.862 0262	0.132 0198	0.133 9005
16	336 58 24.6	1 35 8.1	0 55.5	3 21 9.5	0 52.4	9.861 9565	0.135 7617	0.137 6034
18	340 8 43.0	1 35 10.4	0 36.2	3 22 35.9	0 33.9	9.861 8787	0.139 4259	0.141 2293
20	343 19 6.2	1 35 12.8	+0 16.4	3 23 25.2	−0 15.3	9.861 7930	0.143 0138	0.144 7795
22	346 29 34.3	1 35 15.3	−0 3.6	−3 23 37.1	+0 3.4	9.861 6997	0.146 5266	0.148 2553
24	349 40 7.4	1 35 17.9	0 23.6	3 23 11.6	0 22.1	9.861 5992	0.149 9658	0.151 6583
26	352 50 45.7	1 35 20.5	0 43.3	3 22 8.7	0 40.8	9.861 4917	0.153 3328	0.154 9893
28	356 1 29.4	1 35 23.2	1 2.5	3 20 28.5	0 59.3	9.861 3774	0.156 6280	0.158 2489
30	359 12 18.5	1 35 25.9	1 20.9	3 18 11.4	1 17.7	9.861 2567	0.159 8519	0.161 4371
une 1	2 23 13.1	1 35 28.7	−1 38.3	−3 15 17.6	+1 35.9	9.861 1301	0.163 0044	0.164 5539
3	5 34 13.3	1 35 31.5	1 54.5	3 11 47.6	1 53.9	9.860 9979	0.166 0855	0.167 5992
5	8 45 19.2	1 35 34.4	2 9.4	3 7 42.0	2 11.5	9.860 8604	0.169 0950	0.170 5729
7	11 56 30.9	1 35 37.3	2 22.7	3 3 1.5	2 28.8	9.860 7181	0.172 0328	0.173 4747
9	15 7 48.5	1 35 40.3	2 34.2	2 57 46.9	2 45.7	9.860 5715	0.174 8988	0.176 3051
11	18 19 12.0	1 35 43.3	−2 43.7	−2 51 59.1	+3 2.1	9.860 4209	0.177 6935	0.179 0641
13	21 30 41.6	1 35 46.3	2 51.3	2 45 39.0	3 17.9	9.860 2668	0.180 4171	0.181 7526
15	24 42 17.3	1 35 49.4	2 56.8	2 38 47.9	3 33.1	9.860 1098	0.183 0707	0.184 3714
17	27 53 59.1	1 35 52.5	3 0.0	2 31 27.0	3 47.7	9.859 9502	0.185 6548	0.186 9210
19	31 5 47.2	1 35 55.6	3 1.0	2 23 37.5	4 1.7	9.859 7886	0.188 1702	0.189 4025
21	34 17 41.7	1 35 58.8	−2 59.8	−2 15 20.8	+4 14.9	9.859 6254	0.190 6179	0.191 8166
23	37 29 42.7	1 36 2.1	2 56.3	2 6 38.4	4 27.3	9.859 4612	0.192 9988	0.194 1645
25	40 41 50.2	1 36 5.4	2 50.6	1 57 32.0	4 39.0	9.859 2965	0.195 3138	0.196 4469
27	43 54 4.2	1 36 8.7	2 42.8	1 48 3.1	4 49.8	9.859 1319	0.197 5637	0.198 6642
29	47 6 24.9	1 36 12.1	2 33.0	1 38 13.5	4 59.7	9.858 9677	0.199 7484	0.200 8162
July 1	50 18 52.5	1 36 15.5	−2 21.2	−1 28 5.0	+5 8.7	9.858 8046	0.201 8677	0.202 9028
3	53 31 26.9	1 36 18.9	−2 7.6	−1 17 39.4	+5 16.7	9.858 6430	0.203 9214	0.204 9236

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 1	50 18 52.5	1 36 15.5	−2 21.2	−1 28 5.0	+5 8.7	9.858 8046	0.201 8677	0.202 90
3	53 31 26.9	1 36 18.9	2 7.6	1 17 39.4	5 16.7	9.858 6430	0.203 9214	0.204 923
5	56 44 8.2	1 36 22.4	1 52.4	1 6 58.8	5 23.7	9.858 4834	0.205 9093	0.206 878
7	59 56 56.6	1 36 25.9	1 35.8	0 56 5.1	5 29.8	9.858 3263	0.207 8312	0.208 767
9	63 9 52.1	1 36 29.5	1 18.0	0 45 0.4	5 34.8	9.858 1724	0.209 6868	0.210 589
11	66 22 54.7	1 36 33.1	−0 59.2	−0 33 46.7	+5 38.7	9.858 0220	0.211 4764	0.212 346
13	69 36 4.5	1 36 36.7	0 39.6	0 22 26.1	5 41.6	9.857 8756	0.213 2005	0.214 038
15	72 49 21.4	1 36 40.3	−0 19.5	−0 11 0.8	5 43.5	9.857 7337	0.214 8596	0.215 664
17	76 2 45.6	1 36 43.9	+0 0.8	+0 0 27.1	5 44.2	9.857 5968	0.216 4542	0.217 227
19	79 16 17.0	1 36 47.5	0 21.1	0 11 55.2	5 43.8	9.857 4653	0.217 9852	0.218 727
21	82 29 55.5	1 36 51.1	+0 41.2	+0 23 21.5	+5 42.3	9.857 3396	0.219 4534	0.220 164
23	85 43 41.1	1 36 54.6	1 0.8	0 34 43.8	5 39.7	9.857 2201	0.220 8599	0.221 540
25	88 57 33.7	1 36 58.0	1 19.6	0 45 59.8	5 36.0	9.857 1073	0.222 2054	0.222 855
27	92 11 33.2	1 37 1.4	1 37.4	0 57 7.3	5 31.3	9.857 0015	0.223 4905	0.224 110
29	95 25 39.4	1 37 4.7	1 54.0	1 8 4.2	5 25.5	9.856 9030	0.224 7154	0.225 305
31	98 39 52.1	1 37 8.0	+2 9.2	+1 18 48.4	+5 18.6	9.856 8122	0.225 8799	0.226 439
Aug. 2	101 54 11.2	1 37 11.1	2 22.7	1 29 17.8	5 10.6	9.856 7293	0.226 9837	0.227 51
4	105 8 36.3	1 37 14.0	2 34.3	1 39 30.3	5 1.6	9.856 6547	0.228 0268	0.228 525
6	108 23 7.1	1 37 16.8	2 44.0	1 49 23.9	4 51.7	9.856 5886	0.229 0093	0.229 477
8	111 37 43.4	1 37 19.4	2 51.6	1 58 56.6	4 40.8	9.856 5312	0.229 9311	0.230 369
10	114 52 24.7	1 37 21.8	+2 57.0	+2 8 6.6	+4 29.0	9.856 4827	0.230 7922	0.231 200
12	118 7 10.7	1 37 24.0	3 0.2	2 16 52.1	4 16.3	9.856 4432	0.231 5932	0.231 9713
14	121 22 0.8	1 37 26.0	3 1.0	2 25 11.4	4 2.8	9.856 4130	0.232 3345	0.232 6829
16	124 36 54.7	1 37 27.7	2 59.5	2 33 2.7	3 48.5	9.856 3921	0.233 0167	0.233 3360
18	127 51 51.7	1 37 29.2	2 55.7	2 40 24.6	3 33.4	9.856 3805	0.233 6409	0.233 9316
20	131 6 51.4	1 37 30.4	+2 49.6	+2 47 15.7	+3 17.6	9.856 3783	0.234 2081	0.234 4706
22	134 21 53.1	1 37 31.3	2 41.4	2 53 34.5	3 1.1	9.856 3855	0.234 7193	0.234 9543
24	137 36 56.3	1 37 31.8	2 31.1	2 59 19.8	2 44.1	9.856 4021	0.235 1754	0.235 3829
26	140 52 0.3	1 37 32.0	2 18.8	3 4 30.5	2 26.6	9.856 4281	0.235 5769	0.235 7572
28	144 7 4.4	1 37 31.9	2 4.8	3 9 5.6	2 8.6	9.856 4633	0.235 9239	0.236 0771
30	147 22 7.9	1 37 31.5	+1 49.1	+3 13 4.2	+1 50.1	9.856 5077	0.236 2167	0.236 3427
Sept. 1	150 37 10.2	1 37 30.7	1 32.1	3 16 25.6	1 31.3	9.856 5610	0.236 4551	0.236 5539
3	153 52 10.6	1 37 29.6	1 13.9	3 19 9.1	1 12.2	9.856 6232	0.236 6392	0.236 7109
5	157 7 8.4	1 37 28.1	0 54.7	3 21 14.2	0 52.9	9.856 6939	0.236 7691	0.236 8137
7	160 22 2.8	1 37 26.2	0 34.8	3 22 40.5	0 33.4	9.856 7731	0.236 8448	0.236 8623
9	163 36 53.2	1 37 24.0	+0 14.5	+3 23 27.8	+0 13.9	9.856 8603	0.236 8663	0.236 8568
11	166 51 38.8	1 37 21.5	−0 5.9	3 23 36.1	−0 5.7	9.856 9554	0.236 8339	0.236 7977
13	170 6 19.1	1 37 18.7	0 26.3	3 23 5.3	0 25.2	9.857 0580	0.236 7482	0.236 6856
15	173 20 53.3	1 37 15.5	0 46.4	3 21 55.5	0 44.6	9.857 1677	0.236 6101	0.236 5217
17	176 35 20.9	1 37 12.0	1 5.8	3 20 7.1	1 3.8	9.857 2843	0.236 4205	0.236 3066
19	179 49 41.2	1 37 8.2	−1 24.4	+3 17 40.4	−1 22.8	9.857 4074	0.236 1804	0.236 0419
21	183 3 53.6	1 37 4.1	1 41.9	3 14 36.1	1 41.5	9.857 5365	0.235 8911	0.235 7281
23	186 17 57.6	1 36 59.8	1 58.1	3 10 54.7	1 59.8	9.857 6712	0.235 5529	0.235 3656
25	189 31 52.8	1 36 55.3	2 12.8	3 6 37.1	2 17.7	9.857 8110	0.235 1664	0.234 9552
27	192 45 38.7	1 36 50.5	2 25.8	3 1 44.2	2 35.1	9.857 9556	0.234 7321	0.234 4970
29	195 59 14.9	1 36 45.6	−2 36.9	+2 56 17.0	−2 52.0	9.858 1045	0.234 2500	0.233 9911
Oct. 1	199 12 41.0	1 36 40.5	−2 46.0	+2 50 16.5	−3 8.4	9.858 2572	0.233 7202	0.233 4373

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
ct. 1	199 12 41.0	1 36 40.5	−2 46.0	+2 50 16.5	−3 8.4	9.858 2572	0.233 7202	0.233 4373
3	202 25 56.7	1 36 35.2	2 53.1	2 43 44.0	3 24.0	9.858 4132	0.233 1423	0.232 8353
5	205 39 1.9	1 36 29.9	2 57.9	2 36 40.9	3 39.0	9.858 5719	0.232 5164	0.232 1854
7	208 51 56.3	1 36 24.5	3 0.5	2 29 8.5	3 53.2	9.858 7330	0.231 8424	0.231 4874
9	212 4 39.8	1 36 19.0	3 0.9	2 21 8.3	4 6.7	9.858 8958	0.231 1204	0.230 7413
11	215 17 12.4	1 36 13.5	−2 59.0	+2 12 42.0	−4 19.4	9.859 0599	0.230 3502	0.229 9471
13	218 29 33.9	1 36 8.0	2 54.8	2 3 51.2	4 31.3	9.859 2247	0.229 5322	0.229 1055
15	221 41 44.5	1 36 2.6	2 48.4	1 54 37.5	4 42.3	9.859 3898	0.228 6673	0.228 2176
17	224 53 44.3	1 35 57.2	2 40.0	1 45 2.8	4 52.3	9.859 5546	0.227 7565	0.227 2842
19	228 5 33.3	1 35 51.9	2 29.6	1 35 9.0	5 1.4	9.859 7186	0.226 8007	0.226 3060
21	231 17 11.8	1 35 46.7	−2 17.3	+1 24 57.8	−5 9.6	9.859 8812	0.225 8002	0.225 2834
23	234 28 40.0	1 35 41.6	2 3.3	1 14 31.3	5 16.8	9.860 0421	0.224 7557	0.224 2170
25	237 39 58.3	1 35 36.7	1 47.8	1 3 51.4	5 22.9	9.860 2006	0.223 6674	0.223 1070
27	240 51 6.9	1 35 32.0	1 31.0	0 53 0.1	5 28.1	9.860 3563	0.222 5357	0.221 9536
29	244 2 6.3	1 35 27.5	1 13.0	0 41 59.5	5 32.3	9.860 5088	0.221 3605	0.220 7564
31	247 12 56.8	1 35 23.1	−0 54.2	+0 30 51.6	−5 35.4	9.860 6575	0.220 1413	0.219 5152
ov. 2	250 23 38.9	1 35 19.0	0 34.7	0 19 38.4	5 37.5	9.860 8020	0.218 8781	0.218 2298
4	253 34 13.0	1 35 15.2	−0 14.8	+0 8 22.0	5 38.6	9.860 9418	0.217 5702	0.216 8993
6	256 44 39.8	1 35 11.7	+0 5.2	−0 2 55.5	5 38.7	9.861 0766	0.216 2171	0.215 5235
8	259 54 59.7	1 35 8.4	0 25.1	0 14 12.0	5 37.7	9.861 2059	0.214 8184	0.214 1018
10	263 5 13.3	1 35 5.3	+0 44.8	−0 25 25.6	−5 35.7	9.861 3293	0.213 3738	0.212 6344
12	266 15 21.1	1 35 2.5	1 3.9	0 36 34.1	5 32.6	9.861 4465	0.211 8836	0.211 1215
14	269 25 23.6	1 35 0.1	1 22.2	0 47 35.5	5 28.6	9.861 5571	0.210 3482	0.209 5637
16	272 35 21.6	1 34 58.0	1 39.5	0 58 27.9	5 23.6	9.861 6608	0.208 7680	0.207 9613
18	275 45 15.5	1 34 56.1	1 55.6	1 9 9.3	5 17.6	9.861 7573	0.207 1436	0.206 3149
20	278 55 6.0	1 34 54.5	+2 10.3	−1 19 37.7	−5 10.7	9.861 8463	0.205 4752	0.204 6246
22	282 4 53.6	1 34 53.2	2 23.3	1 29 51.4	5 2.8	9.861 9275	0.203 7630	0.202 8905
24	285 14 38.9	1 34 52.2	2 34.6	1 39 48.5	4 54.0	9.862 0006	0.202 0071	0.201 1126
26	288 24 22.4	1 34 51.5	2 44.1	1 49 27.1	4 44.4	9.862 0655	0.200 2070	0.199 2903
28	291 34 4.7	1 34 51.0	2 51.5	1 58 45.6	4 33.9	9.862 1220	0.198 3624	0.197 4233
30	294 43 46.4	1 34 50.8	+2 56.8	−2 7 42.3	−4 22.6	9.862 1699	0.196 4728	0.195 5107
Dec. 2	297 53 28.0	1 34 50.9	3 0.0	2 16 15.6	4 10.5	9.862 2091	0.194 5370	0.193 5517
4	301 3 10.0	1 34 51.2	3 1.0	2 24 23.9	3 57.6	9.862 2394	0.192 5546	0.191 5454
6	304 12 52.8	1 34 51.7	2 59.8	2 32 5.8	3 44.1	9.862 2608	0.190 5241	0.189 4905
8	307 22 36.9	1 34 52.5	2 56.4	2 39 20.0	3 29.9	9.862 2732	0.188 4445	0.187 3861
10	310 32 22.8	1 34 53.5	+2 50.9	−2 46 5.1	−3 15.0	9.862 2765	0.186 3152	0.185 2318
12	313 42 10.8	1 34 54.7	2 43.3	2 52 19.8	2 59.6	9.862 2708	0.184 1360	0.183 0276
14	316 52 1.3	1 34 56.0	2 33.6	2 58 3.1	2 43.6	9.862 2561	0.181 9067	0.180 7732
16	320 1 54.7	1 34 57.5	2 22.1	3 3 13.9	2 27.1	9.862 2325	0.179 6273	0.178 4689
18	323 11 51.3	1 34 59.2	2 8.9	3 7 51.2	2 10.2	9.862 1999	0.177 2980	0.176 1145
20	326 21 51.4	1 35 1.0	+1 54.1	−3 11 54.3	−1 52.8	9.862 1584	0.174 9184	0.173 7096
22	329 31 55.3	1 35 3.0	1 37.9	3 15 22.3	1 35.1	9.862 1083	0.172 4881	0.171 2537
24	332 42 3.3	1 35 5.1	1 20.6	3 18 14.6	1 17.1	9.862 0497	0.170 0065	0.168 7463
26	335 52 15.6	1 35 7.3	1 2.2	3 20 30.7	0 58.9	9.861 9827	0.167 4731	0.166 1867
28	339 2 32.4	1 35 9.6	0 43.0	3 22 10.0	0 40.4	9.861 9075	0.164 8869	0.163 5735
30	342 12 53.9	1 35 11.9	+0 23.3	−3 23 12.3	−0 21.8	9.861 8244	0.162 2464	0.160 9055
32	345 23 20.2	1 35 14.4	+0 3.4	−3 23 37.3	−0 3.2	9.861 7336	0.159 5504	0.158 1810

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance f Earth—	
							At Date.	At Inter diate D
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Apr. 1	278 4 52.0	2 51 57.8	+12 36.2	−5 26 3.7	−13 14.6	9.660 8091	0.033 5594	0.036
2	280 57 45.2	2 53 50.9	12 16.7	5 38 57.4	12 32.3	9.658 5993	0.038 8253	0.041
3	283 52 38.5	2 55 58.0	11 49.3	5 51 7.5	11 47.4	9.656 1237	0.043 9661	0.046
4	286 49 46.1	2 58 19.6	11 14.2	6 2 31.3	10 59.6	9.653 3814	0.048 9826	0.051
5	289 49 22.7	3 0 56.1	10 31.3	6 13 5.7	10 8.6	9.650 3714	0.053 8756	0.056
6	292 51 43.4	3 3 48.1	+ 9 40.8	−6 22 47.4	− 9 14.1	9.647 0931	0.058 6452	0.060
7	295 57 4.1	3 6 56.2	8 42.8	6 31 32.6	8 15.7	9.643 5462	0.063 2911	0.065
8	299 5 41.3	3 10 21.0	7 37.6	6 39 17.3	7 13.0	9.639 7306	0.067 8125	0.070
9	302 17 51.9	3 14 3.1	6 25.6	6 45 57.1	6 5.7	9.635 6466	0.072 2079	0.074
10	305 33 53.5	3 18 3.2	5 7.2	6 51 27.1	4 53.3	9.631 2953	0.076 4753	0.078
11	308 54 4.6	3 22 22.2	+ 3 43.1	−6 55 41.9	− 3 35.3	9.626 6788	0.080 6121	0.082
12	312 18 44.4	3 27 0.7	2 14.0	6 58 35.8	2 11.4	9.621 8001	0.084 6148	0.086
13	315 48 12.7	3 31 59.3	+ 0 40.9	7 0 2.6	− 0 41.0	9.616 6634	0.088 4790	0.090 35
14	319 22 50.0	3 37 18.8	− 0 55.1	6 59 55.4	+ 0 56.5	9.611 2745	0.092 1996	0.094
15	323 2 57.4	3 42 59.8	2 32.7	6 58 7.0	2 41.5	9.605 6413	0.095 7703	0.097 49
16	326 48 56.8	3 49 2.7	− 4 10.3	−6 54 29.8	+ 4 34.3	9.599 7740	0.099 1837	0.100 82
17	330 41 10.2	3 55 27.9	5 46.1	6 48 55.7	6 35.4	9.593 6854	0.102 4318	0.103 99
18	334 40 0.1	4 2 15.7	7 18.1	6 41 16.3	8 45.0	9.587 3914	0.105 5048	0.106 97
19	338 45 49.1	4 9 26.0	8 44.0	6 31 22.9	11 3.2	9.580 9119	0.108 3917	0.109 76
20	342 58 59.5	4 16 58.4	10 1.4	6 19 7.0	13 30.0	9.574 2712	0.111 0803	0.112 34
21	347 19 53.0	4 24 52.1	−11 7.6	−6 4 20.0	+16 5.3	9.567 4982	0.113 5569	0.114 71
22	351 48 50.3	4 33 5.7	11 59.9	5 46 53.9	18 48.2	9.560 6275	0.115 8062	0.116 84
23	356 26 10.4	4 41 37.3	12 35.5	5 26 41.5	21 37.6	9.553 6999	0.117 8115	0.118 717
24	1 12 10.0	4 50 24.2	12 51.6	5 3 37.1	24 31.9	9.546 7630	0.119 5548	0.120 32
25	6 7 2.9	4 59 23.0	12 45.9	4 37 36.7	27 29.2	9.539 8714	0.121 0167	0.121 635
26	11 10 58.7	5 8 29.2	−12 16.5	−4 8 38.7	+30 26.5	9.533 0868	0.122 1763	0.122 63
27	16 24 2.0	5 17 37.2	11 22.2	3 36 44.9	33 20.2	9.526 4784	0.123 0119	0.123 301
28	21 46 11.5	5 26 40.3	10 2.6	3 2 1.0	36 6.1	9.520 1221	0.123 5007	0.123 60
29	27 17 18.4	5 35 30.7	8 18.7	2 24 37.2	38 39.1	9.514 0994	0.123 6197	0.123 533
30	32 57 5.7	5 43 59.5	6 12.7	1 44 49.0	40 53.7	9.508 4961	0.123 3462	0.123 055
May 1	38 45 7.0	5 51 57.1	− 3 48.6	−1 2 57.8	+42 44.1	9.503 4000	0.122 6583	0.122 152
2	44 40 46.0	5 59 12.9	− 1 11.6	−0 19 30.7	44 4.6	9.498 8982	0.121 5347	0.120 803
3	50 43 15.5	6 5 36.3	+ 1 31.6	+0 24 59.7	44 49.7	9.495 0735	0.119 9569	0.118 99
4	56 51 37.8	6 10 56.9	4 13.2	1 9 55.6	44 55.1	9.492 0013	0.117 9092	0.116 705
5	63 4 45.2	6 15 5.1	6 44.8	1 54 35.7	44 17.7	9.489 7453	0.115 3790	0.113 930
6	69 21 21.1	6 17 52.6	+ 8 58.5	+2 38 16.4	+42 56.3	9.488 3542	0.112 3579	0.110 662
7	75 40 1.5	6 19 13.4	10 46.7	3 20 13.9	40 51.8	9.487 8588	0.108 8423	0.106 899
8	81 59 17.7	6 19 3.8	12 3.5	3 59 46.4	38 7.0	9.488 2703	0.104 8333	0.102 645
9	88 17 38.7	6 17 23.2	12 45.1	4 36 16.0	34 46.8	9.489 5794	0.100 3369	0.097 909
10	94 33 34.5	6 14 14.0	12 49.7	5 9 10.4	30 57.7	9.491 7572	0.095 3640	0.092 703
11	100 45 38.7	6 9 41.1	+12 18.3	+5 38 4.5	+26 47.5	9.494 7563	0.089 9293	0.087 0443
12	106 52 31.4	6 3 52.4	11 13.6	6 2 41.1	22 24.2	9.498 5142	0.084 0509	0.080 952
13	112 53 1.6	5 56 57.7	9 40.5	6 22 51.0	17 55.4	9.502 9566	0.077 7507	0.074 4499
14	118 46 8.5	5 49 7.8	7 44.7	6 38 32.3	13 28.1	9.508 0012	0.071 0526	0.067 5620
15	124 31 2.5	5 40 34.1	5 32.8	6 49 49.8	9 8.7	9.513 5613	0.063 9815	0.060 3142
16	130 7 5.8	5 31 28.2	+ 3 11.6	+6 56 54.0	+ 5 2.2	9.519 5488	0.056 5636	0.052 7329
17	135 [illegible]	[illegible] 1.2	+ 0 47.3	+6 59 59.6	+ 1 12.0	9.525 8777	0.048 8253	0.044 8440

MERCURY.

GREENWICH MEAN NOON.

ate.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
y 16	130 7 5.8	5 31 28.2	+ 3 11.6	+6 56 54.0	+ 5 2.2	9.519 5488	0.056 5636	0.052 7329
17	135 33 51.8	5 22 1.2	+ 0 47.3	6 59 59.6	+ 1 12.0	9.525 8777	0.048 8253	0.044 8440
18	140 51 4.4	5 12 23.0	− 1 34.4	6 59 24.2	− 2 19.4	9.532 4660	0.040 7923	0.036 6733
19	145 58 37.0	5 2 42.5	3 48.8	6 55 27.5	5 30.6	9.539 2373	0.032 4901	0.028 2458
20	150 56 31.0	4 53 7.1	5 52.2	6 48 29.8	8 21.3	9.546 1218	0.023 9433	0.019 5855
21	155 44 54.9	4 43 43.0	− 7 41.7	+6 38 51.5	−10 51.8	9.553 0570	0.015 1753	0.010 7154
22	160 24 2.4	4 34 35.1	9 15.5	6 26 52.5	13 3.0	9.559 9875	0.006 2086	0.001 6574
23	164 54 11.6	4 25 47.0	10 32.4	6 12 51.4	14 56.1	9.566 8653	9.997 0644	9.992 4321
24	169 15 43.8	4 17 21.4	11 32.2	5 57 5.7	16 32.5	9.573 6490	9.987 7630	9.983 0595
25	173 29 2.5	4 9 20.2	12 14.9	5 39 51.4	17 53.6	9.580 3033	9.978 3239	9.973 5586
26	177 34 32.5	4 1 44.3	−12 41.2	+5 21 23.0	−19 1.1	9.586 7988	9.968 7658	9.963 9477
27	181 32 39.6	3 54 34.2	12 51.9	5 1 53.3	19 56.4	9.593 1109	9.959 1066	9.954 2447
28	185 23 49.5	3 47 49.9	12 48.2	4 41 33.8	20 40.9	9.599 2193	9.949 3642	9.944 4672
29	189 8 28.0	3 41 31.4	12 31.2	4 20 34.7	21 16.0	9.605 1077	9.939 5560	9.934 6329
30	192 47 0.7	3 35 38.0	12 2.4	3 59 4.7	21 42.8	9.610 7630	9.929 7001	9.924 7597
31	196 19 52.1	3 30 8.8	−11 23.1	+3 37 11.5	−22 2.4	9.616 1748	9.919 8140	9.914 8654
me 1	199 47 26.2	3 25 3.2	10 34.6	3 15 2.0	22 15.8	9.621 3351	9.909 9162	9.904 9689
2	203 10 6.1	3 20 20.2	9 38.3	2 52 41.8	22 23.8	9.626 2380	9.900 0260	9.895 0900
3	206 28 13.8	3 15 58.8	8 35.4	2 30 15.9	22 27.2	9.630 8789	9.890 1637	9.885 2497
4	209 42 10.6	3 11 58.1	7 27.1	2 7 48.7	22 26.6	9.635 2548	9.880 3509	9.875 4702
5	212 52 16.6	3 8 17.2	− 6 14.6	+1 45 23.9	−22 22.6	9.639 3637	9.870 6108	9.865 7758
6	215 58 51.3	3 4 55.2	4 59.0	1 23 4.6	22 15.5	9.643 2043	9.860 9684	9.856 1922
7	219 2 13.1	3 1 51.3	3 41.2	1 0 53.7	22 5.9	9.646 7762	9.851 4509	9.846 7482
8	222 2 39.6	2 59 4.6	2 22.2	0 38 53.5	21 54.1	9.650 0794	9.842 0879	9.837 4741
9	225 0 27.7	2 56 34.4	− 1 2.7	+0 17 6.2	21 40.3	9.653 1140	9.832 9112	9.828 4035
10	227 55 53.6	2 54 20.0	+ 0 16.3	−0 4 26.5	−21 24.8	9.655 8809	9.823 9554	9.819 5718
11	230 49 12.7	2 52 20.8	1 34.2	0 25 42.9	21 7.8	9.658 3811	9.815 2578	9.811 0183
12	233 40 40.0	2 50 36.3	2 50.4	0 46 41.7	20 49.4	9.660 6155	9.806 8587	9.802 7843
13	236 30 29.9	2 49 5.9	4 4.1	1 7 21.5	20 29.8	9.662 5850	9.798 8008	9.794 9139
14	239 18 56.3	2 47 49.2	5 14.9	1 27 41.1	20 9.1	9.664 2906	9.791 1295	9.787 4537
15	242 6 12.7	2 46 45.8	+ 6 22.1	−1 47 39.4	−19 47.3	9.665 7332	9.783 8926	9.780 4525
16	244 52 32.2	2 45 55.4	7 25.4	2 7 15.3	19 24.4	9.666 9138	9.777 1397	9.773 9607
17	247 38 7.7	2 45 17.8	8 24.2	2 26 27.9	19 0.5	9.667 8330	9.770 9218	9.768 0294
18	250 23 11.9	2 44 52.7	9 18.1	2 45 16.0	18 35.5	9.668 4914	9.765 2899	9.762 7096
19	253 7 57.2	2 44 39.9	10 6.7	3 3 38.6	18 9.4	9.668 8895	9.760 2948	9.758 0515
20	255 52 35.8	2 44 39.4	+10 49.7	−3 21 34.6	−17 42.3	9.669 0275	9.755 9859	9.754 1037
21	258 37 20.0	2 44 51.1	11 26.7	3 39 2.9	17 14.1	9.668 9057	9.752 4103	9.750 9110
22	261 22 22.0	2 45 15.0	11 57.5	3 56 2.3	16 44.5	9.668 5238	9.749 6106	9.748 5136
23	264 7 54.1	2 45 51.2	12 21.7	4 12 31.4	16 13.5	9.667 8815	9.747 6243	9.746 9464
24	266 54 8.5	2 46 39.7	12 39.0	4 28 28.8	15 41.1	9.666 9785	9.746 4831	9.746 2373
25	269 41 17.6	2 47 40.7	+12 49.3	−4 43 53.0	−15 7.0	9.665 8142	9.746 2111	9.746 4062
26	272 29 34.1	2 48 54.5	12 52.3	4 58 42.3	14 31.2	9.664 3878	9.746 8238	9.747 4644
27	275 19 10.8	2 50 21.1	12 47.8	5 12 54.7	13 53.4	9.662 6986	9.748 3279	9.749 4138
28	278 10 20.7	2 52 1.0	12 35.7	5 26 28.2	13 13.4	9.660 7455	9.750 7208	9.752 2471
29	281 3 17.3	2 53 54.6	12 15.9	5 39 20.6	12 31.0	9.658 5275	9.753 9905	9.755 9482
30	283 58 14.5	2 56 2.1	+11 48.4	−5 51 29.3	−11 46.0	9.656 0438	9.758 1167	9.760 4921
July 1	286 55 26.4	2 58 24.1	+11 13.0	−6 2 51.6	−10 58.1	9.653 2935	9.763 0702	9.765 8464

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth—	
							At Date.	At Interme diate Date
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 1	286 55 26.4	2 58 24.1	+11 13.0	−6 2 51.6	−10 58.1	9.653 2935	9.763 0703	9.765 846
2	289 55 7.7	3 1 1.1	10 29.9	6 13 24.4	10 7.0	9.650 2756	9.768 8154	9.771 972
3	292 57 33.8	3 3 53.6	9 39.1	6 23 4.4	9 12.4	9.646 9892	9.775 3104	9.778 824
4	296 3 0.3	3 7 2.1	8 40.9	6 31 47.9	8 13.9	9.643 4341	9.782 5081	9.786 354
5	299 11 43.6	3 10 27.4	7 35.5	6 39 30.7	7 11.0	9.639 6102	9.790 3577	9.794 510
6	302 24 0.9	3 14 10.1	+ 6 23.3	−6 46 8.4	− 6 3.5	9.635 5179	9.798 8061	9.803 237
7	305 40 9.9	3 18 10.9	5 4.7	6 51 36.1	4 50.9	9.631 1585	9.807 7987	9.812 481
8	309 0 29.0	3 22 30.4	3 40.4	6 55 48.5	3 32.8	9.626 5339	9.817 2806	9.822 187
9	312 25 17.3	3 27 9.4	2 11.2	6 58 39.8	2 8.7	9.621 6473	9.827 1971	9.832 303
10	315 54 54.6	3 32 8.7	+ 0 38.0	7 0 3.8	− 0 38.0	9.616 5028	9.837 4948	9.842 770
11	319 29 41.6	3 37 28.9	− 0 58.1	−6 59 53.6	+ 0 59.7	9.611 1063	9.848 1212	9.853 541
12	323 9 59.5	3 43 10.5	2 35.7	6 58 2.0	2 44.8	9.605 4658	9.859 0261	9.864 567
13	326 56 9.9	3 49 14.0	4 13.2	6 54 21.3	4 37.8	9.599 5915	9.870 1612	9.875 800
14	330 48 35.0	3 55 40.0	5 49.0	6 48 43.5	6 39.2	9.593 4963	9.881 4801	9.887 194
15	334 47 37.4	4 2 28.6	7 20.8	6 41 0.1	8 49.1	9.587 1963	9.892 9385	9.898 706
16	338 53 39.6	4 9 39.5	− 8 46.5	−6 31 2.5	+11 7.6	9.580 7115	9.904 4940	9.910 295
17	343 7 3.8	4 17 12.5	10 3.6	6 18 42.0	13 34.7	9.574 0661	9.916 1057	9.921 9
18	347 28 11.7	4 25 6.8	11 9.5	6 3 50.2	16 10.2	9.567 2895	9.927 7341	9.933 542
19	351 57 24.1	4 33 21.0	12 1.3	5 46 19.1	18 53.2	9.560 4164	9.939 3411	9.945 124
20	356 34 59.8	4 41 53.2	12 36.3	5 26 1.6	21 42.8	9.553 4877	9.950 8892	9.956 620
21	1 21 15.5	4 50 40.7	−12 51.8	−5 2 51.9	+24 37.4	9.546 5512	9.962 3414	9.968 020
22	6 16 24.8	4 59 39.8	12 45.4	4 36 46.0	27 34.7	9.539 6618	9.973 6613	9.979 260
23	11 20 37.3	5 8 46.0	12 15.2	4 7 42.6	30 31.9	9.532 8815	9.984 8124	9.990 313
24	16 33 57.4	5 17 53.8	11 20.1	3 35 43.5	33 25.4	9.526 2797	9.995 7586	0.001 143
25	21 56 23.4	5 26 56.7	9 59.7	3 0 54.4	36 10.9	9.519 9323	0.006 4639	0.011 714
26	27 27 46.5	5 35 46.6	− 8 15.1	−2 23 25.9	+38 43.4	9.513 9211	0.016 8920	0.021 991
27	33 7 49.4	5 44 14.7	6 8.5	1 43 33.7	40 57.4	9.508 3319	0.027 0074	0.031 936
28	38 56 5.4	5 52 11.2	3 43.9	1 1 39.1	42 47.0	9.503 2526	0.036 7753	0.041 518
29	44 51 57.7	5 59 25.6	− 1 6.6	−0 18 9.5	44 6.5	9.498 7702	0.046 1623	0.050 703
30	50 54 38.9	6 5 47.2	+ 1 36.6	+0 26 22.2	44 50.5	9.494 9675	0.055 1367	0.059 459
31	57 3 11.0	6 11 5.7	+ 4 18.0	+1 11 18.3	+44 54.6	9.491 9193	0.063 6693	0.067 761
Aug. 1	63 16 26.0	6 15 11.5	6 49.2	1 55 57.3	44 15.9	9.489 6888	0.071 7348	0.075 585
2	69 33 7.1	6 17 56.5	9 2.2	2 39 35.5	42 53.1	9.488 3245	0.079 3115	0.082 9111
3	75 51 50.1	6 19 14.6	10 49.5	3 21 29.2	40 47.2	9.487 8568	0.086 3826	0.089 724
4	82 11 6.1	6 19 2.2	12 5.3	4 0 56.6	38 1.2	9.488 2960	0.092 9362	0.096 016
5	88 29 24.1	6 17 18.8	+12 45.8	+4 37 19.9	+34 40.1	9.489 6322	0.098 9659	0.101 783
6	94 45 14.2	6 14 6.8	12 49.3	5 10 7.3	30 50.4	9.491 8358	0.104 4707	0.107 027
7	100 57 10.1	6 9 31.6	12 16.8	5 38 53.8	26 39.7	9.494 8592	0.109 4550	0.111 754
8	107 3 52.3	6 3 40.8	11 11.2	6 3 22.4	22 16.0	9.498 6393	0.113 9277	0.115 976
9	113 4 9.8	5 56 44.2	9 37.2	6 23 24.0	17 47.1	9.503 1016	0.117 9021	0.119 7074
10	118 57 2.3	5 48 52.7	+ 7 40.8	+6 38 57.1	+13 20.0	9.508 1634	0.121 3946	0.122 9663
11	124 41 40.8	5 40 17.9	5 28.6	6 50 6.6	9 0.9	9.513 7378	0.124 4250	0.125 773
12	130 17 27.5	5 31 11.2	3 7.2	6 57 3.2	4 54.8	9.519 7370	0.127 0146	0.128 1511
13	135 43 56.2	5 21 43.7	+ 0 42.9	7 0 1.7	+ 1 5.2	9.526 0750	0.129 1859	0.130 1219
14	141 0 51.2	5 12 5.3	− 1 38.7	6 59 19.9	− 2 25.6	9.532 6700	0.130 9621	0.131 7093
15	146 8 6.0	5 2 24.8	− 3 52.8	+6 55 17.3	− 5 36.2	9.539 4460	0.132 3665	0.132 9365
16	151 5 42.4	4 52 49.6	− 5 55.8	+6 48 14.3	− 8 26.3	9.546 3330	0.133 4221	0.133 8259

MERCURY.

GREENWICH MEAN NOON.

ate.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
g. 16	151 5 42.4	4 52 49.6	− 5 55.8	+6 48 14.3	− 8 26.3	9.546 3330	0.133 4221	0.133 8259
17	155 53 49.1	4 43 26.0	7 44.8	6 38 31.4	10 56.2	9.553 2689	0.134 1506	0.134 3987
18	160 32 39.9	4 34 18.7	9 18.1	6 26 28.3	13 6.9	9.560 1986	0.134 5728	0.134 6754
19	165 2 33.0	4 25 31.2	10 34.5	6 12 23.7	14 59.4	9.567 0742	0.134 7087	0.134 6751
20	169 23 49.7	4 17 6.3	11 33.8	5 56 35.1	16 35.2	9.573 8545	0.134 5766	0.134 4152
21	173 36 53.7	4 9 5.8	−12 16.0	+5 39 18.3	−17 55.9	9.580 5045	0.134 1929	0.133 9118
22	177 42 9.8	4 1 30.6	12 41.8	5 20 47.8	19 3.0	9.586 9949	0.133 5736	0.133 1799
23	181 40 3.6	3 54 21.4	12 52.0	5 1 16.4	19 58.0	9.593 3010	0.132 7323	0.132 2325
24	185 31 1.2	3 47 38.0	12 47.9	4 40 55.5	20 42.1	9.599 4029	0.131 6817	0.131 0814
25	189 15 28.2	3 41 20.2	12 30.5	4 19 55.3	21 16.8	9.605 2844	0.130 4329	0.129 7374
26	192 53 50.0	3 35 27.5	−12 1.3	+3 58 24.5	−21 43.4	9.610 9324	0.128 9960	0.128 2097
27	196 26 31.3	3 29 59.2	11 21.7	3 36 30.7	22 2.9	9.616 3366	0.127 3795	0.126 5064
28	199 53 56.1	3 24 54.3	10 32.9	3 14 20.8	22 16.1	9.621 4893	0.125 5911	0.124 6345
29	203 16 27.3	3 20 11.9	9 36.4	2 52 0.3	22 24.0	9.626 3843	0.123 6373	0.122 6002
30	206 34 27.0	3 15 51.1	8 33.3	2 29 34.3	22 27.3	9.631 0172	0.121 5236	0.120 4083
31	209 48 16.4	3 11 51.0	− 7 24.9	+2 7 7.1	−22 26.5	9.635 3850	0.119 2546	0.118 0631
pt. 1	212 58 15.6	3 8 10.7	6 12.3	1 44 42.4	22 22.3	9.639 4856	0.116 8340	0.115 5678
2	216 4 44.1	3 4 49.3	4 56.6	1 22 23.4	22 15.2	9.643 3179	0.114 2647	0.112 9250
3	219 8 0.2	3 1 45.9	3 38.8	1 0 12.8	22 5.6	9.646 8815	0.111 5489	0.110 1366
4	222 8 21.6	2 58 59.7	2 19.7	0 38 13.0	21 53.7	9.650 1764	0.108 6882	0.107 2039
5	225 6 5.1	2 56 30.0	− 1 0.3	+0 16 26.0	−21 39.9	9.653 2028	0.105 6836	0.104 1273
6	228 1 26.8	2 54 16.1	+ 0 18.7	−0 5 6.2	21 24.3	9.655 9617	0.102 5350	0.100 9067
7	230 54 42.3	2 52 17.4	1 36.6	0 26 22.1	21 7.2	9.658 4538	0.099 2422	0.097 5414
8	233 46 6.4	2 50 33.3	2 52.7	0 47 20.3	20 48.8	9.660 6799	0.095 8042	0.094 0304
9	236 35 53.5	2 49 3.3	4 6.4	1 7 59.4	20 29.2	9.662 6413	0.092 2197	0.090 3719
10	239 24 17.5	2 47 47.0	+ 5 17.0	−1 28 18.3	−20 8.5	9.664 3388	0.088 4867	0.086 5638
11	242 11 31.9	2 46 44.0	6 24.1	1 48 16.0	19 46.7	9.665 7733	0.084 6029	0.082 6036
12	244 57 49.9	2 45 54.1	7 27.2	2 7 51.3	19 23.7	9.666 9458	0.080 5656	0.078 4884
13	247 43 24.3	2 45 16.8	8 25.9	2 27 3.1	18 59.7	9.667 8570	0.076 3715	0.074 2146
14	250 28 27.7	2 44 52.0	9 19.6	2 45 50.4	18 34.7	9.668 5075	0.072 0171	0.069 7786
15	253 13 12.5	2 44 39.7	+10 8.1	−3 4 12.2	−18 8.7	9.668 8975	0.067 4985	0.065 1763
16	255 57 51.1	2 44 39.6	10 50.9	3 22 7.4	17 41.6	9.669 0275	0.062 8115	0.060 4034
17	258 42 35.7	2 44 51.6	11 27.8	3 39 34.9	17 13.2	9.668 8976	0.057 9515	0.055 4551
18	261 27 38.4	2 45 15.9	11 58.3	3 56 33.4	16 43.5	9.668 5075	0.052 9136	0.050 3264
19	264 13 11.6	2 45 52.5	12 22.3	4 13 1.5	16 12.5	9.667 8571	0.047 6928	0.045 0121
20	266 59 27.5	2 46 41.4	+12 39.4	−4 28 57.9	−15 40.0	9.666 9461	0.042 2837	0.039 5068
21	269 46 38.5	2 47 42.8	12 49.5	4 44 21.0	15 5.9	9.665 7736	0.036 6808	0.033 8049
22	272 34 57.3	2 48 57.0	12 52.2	4 59 9.1	14 30.0	9.664 3389	0.030 8784	0.027 9006
23	275 24 36.7	2 50 24.0	12 47.5	5 13 20.4	13 52.2	9.662 6415	0.024 8708	0.021 7883
24	278 15 49.7	2 52 4.3	12 35.2	5 26 52.7	13 12.1	9.660 6803	0.018 6524	0.015 4625
25	281 8 49.8	2 53 58.3	+12 15.2	−5 39 43.8	−12 29.6	9.658 4542	0.012 2178	0.008 9177
26	284 3 50.9	2 56 6.3	11 47.3	5 51 51.1	11 44.5	9.655 9622	0.005 5617	0.002 1491
27	287 1 7.3	2 58 28.8	11 11.8	6 3 11.9	10 56.6	9.653 2034	9.998 6794	9.995 1522
28	290 0 53.5	3 1 6.2	10 28.4	6 13 43.2	10 5.4	9.650 1770	9.991 5671	9.987 9236
29	293 3 24.9	3 3 59.2	9 37.4	6 23 21.5	9 10.6	9.646 8822	9.984 2217	9.980 4613
30	296 8 57.3	3 7 8.2	+ 8 39.0	−6 32 3.1	− 8 11.9	9.643 3186	9.976 6423	9.972 7647
Oct. 1	299 17 47.0	3 10 34.0	+ 7 33.4	−6 39 44.0	− 7 9.0	9.639 4862	9.968 8289	9.964 8354

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth—	
							At Date.	At Interm diate Date
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 1	299 17 47.0	3 10 34.0	+ 7 33.4	−6 39 44.0	− 7 9.0	9.639 4862	9.968 8289	9.964 8
2	302 30 11.2	3 14 17.2	6 20.9	6 46 19.6	6 1.4	9.635 3857	9.960 7848	9.956 67
3	305 46 27.7	3 18 18.6	5 2.2	6 51 45.1	4 48.6	9.631 0180	9.952 5156	9.948 29
4	309 6 54.9	3 22 38.8	3 37.7	6 55 55.1	3 30.3	9.626 3851	9.944 0318	9.939 71
5	312 31 51.9	3 27 18.5	2 8.4	6 58 43.8	2 6.0	9.621 4902	9.935 3485	9.930 93
6	316 1 38.6	3 32 18.4	+ 0 35.0	−7 0 4.9	− 0 35.1	9.616 3377	9.926 4869	9.921 99
7	319 36 35.6	3 37 39.2	− 1 1.1	6 59 51.7	+ 1 2.8	9.610 9334	9.917 4756	9.912 92
8	323 17 4.2	3 43 21.5	2 38.7	6 57 56.9	2 48.2	9.605 2853	9.908 3530	9.903 76
9	327 3 26.0	3 49 25.8	4 16.2	6 54 12.7	4 41.5	9.599 4038	9.899 1686	9.894 57
10	330 56 3.2	3 55 52.4	5 51.9	6 48 31.1	6 43.1	9.593 3019	9.889 9848	9.885 41
11	334 55 18.4	4 2 41.7	− 7 23.6	−6 40 43.7	+ 8 53.3	9.586 9958	9.880 8799	9.876 38
12	339 1 34.1	4 9 53.4	8 49.1	6 30 41.8	11 12.1	9.580 5054	9.871 9489	9.867 58
13	343 15 12.5	4 17 27.1	10 5.9	6 18 16.7	13 39.5	9.573 8553	9.863 3065	9.859 13
14	347 36 35.4	4 25 22.0	11 11.3	6 3 20.1	16 15.1	9.567 0750	9.855 0875	9.851 18
15	352 6 3.2	4 33 36.8	12 2.6	5 45 43.9	18 58.4	9.560 1994	9.847 4470	9.843 89
16	356 43 55.0	4 42 9.5	−12 37.1	−5 25 21.1	+21 48.2	9.553 2696	9.840 5584	9.837 45
17	1 30 27.3	4 50 57.4	12 51.9	5 2 5.9	24 42.9	9.546 3337	9.834 6094	9.832 04
18	6 25 53.6	4 59 56.8	12 44.8	4 35 54.5	27 40.2	9.539 4467	9.829 7951	9.827 87
19	11 30 23.2	5 9 3.3	12 13.9	4 6 45.6	30 37.3	9.532 6708	9.826 3085	9.825 11
20	16 44 0.6	5 18 11.1	11 18.0	3 34 41.1	33 30.7	9.526 0757	9.824 3275	9.823 94
21	22 6 43.7	5 27 13.6	− 9 56.9	−2 59 46.9	+36 15.9	9.519 7376	9.824 0013	9.824 49
22	27 38 23.5	5 36 3.0	8 11.5	2 22 13.6	38 47.9	9.513 7382	9.825 4357	9.826 831
23	33 18 42.3	5 44 30.3	6 4.3	1 42 17.2	41 1.3	9.508 1636	9.828 6820	9.830 98
24	39 7 13.3	5 52 25.6	3 39.2	1 0 19.2	42 50.1	9.503 1017	9.833 7284	9.836 905
25	45 3 19.3	5 59 38.4	− 1 1.6	−0 16 47.1	44 8.5	9.498 6393	9.840 4986	9.844 40
26	51 6 12.5	6 5 58.2	+ 1 41.7	+0 27 46.0	+44 51.3	9.494 8591	9.848 8575	9.853 576
27	57 14 54.7	6 11 14.6	4 22.9	1 12 42.2	44 54.1	9.491 8357	9.858 6202	9.863 960
28	63 28 17.5	6 15 18.0	6 53.7	1 57 19.9	44 14.0	9.489 6319	9.869 5670	9.875 410
29	69 45 3.7	6 18 0.2	9 6.0	2 40 55.6	42 49.8	9.488 2955	9.881 4594	9.887 684
30	76 3 49.1	6 19 15.3	10 52.4	3 22 45.3	40 42.6	9.487 8562	9.894 0549	9.900 542
31	82 23 4.6	6 19 0.1	+12 7.1	+4 2 7.5	+37 55.4	9.488 3240	9.907 1196	9.913 759
Nov. 1	88 41 19.4	6 17 14.0	12 46.4	4 38 24.6	34 33.3	9.489 6881	9.920 4387	9.927 1334
2	94 57 3.4	6 13 59.3	12 48.8	5 11 4.8	30 42.9	9.491 9182	9.933 8228	9.940 4876
3	101 8 50.7	6 9 21.6	12 15.2	5 39 43.5	26 31.7	9.494 9663	9.947 1104	9.953 6756
4	107 15 21.9	6 3 28.7	11 8.6	6 4 3.9	22 7.6	9.498 7690	9.960 1693	9.966 5793
5	113 15 26.4	5 56 30.2	+ 9 33.9	+6 23 57.1	+17 38.6	9.503 2514	9.972 8951	9.979 1076
6	119 8 4.1	5 48 37.1	7 36.9	6 39 21.8	13 11.8	9.508 3307	9.985 2092	9.991 1934
7	124 52 26.3	5 40 1.1	5 24.3	6 50 23.3	8 53.1	9.513 9198	9.997 0549	0.002 7895
8	130 27 55.8	5 30 53.6	3 2.7	6 57 12.3	4 47.4	9.519 9310	0.008 3942	0.013 8667
9	135 54 6.7	5 21 25.6	+ 0 38.4	7 0 3.6	+ 0 58.3	9.526 2784	0.019 2056	0.024 4100
10	141 10 43.4	5 11 47.0	− 1 43.0	+6 59 15.2	− 2 31.8	9.532 8803	0.029 4796	0.034 4147
11	146 17 40.0	5 2 6.6	3 56.8	6 55 6.7	5 41.7	9.539 6606	0.039 2161	0.043 8849
12	151 14 58.5	4 52 31.8	5 59.4	6 47 58.5	8 31.2	9.546 5500	0.048 4227	0.052 8313
13	156 2 47.5	4 43 8.6	7 48.0	6 38 11.0	11 0.6	9.553 4864	0.057 1125	0.061 2686
14	160 41 21.1	4 34 1.7	9 20.7	6 26 3.8	13 10.6	9.560 4151	0.065 3019	0.069 2149
15	165 10 57.6	4 25 14.9	−10 36.6	+6 11 55.8	−15 2.5	9.567 2884	0.073 0100	0.076 6898
16	169 31 58.5	4 16 50.9	−11 35.3	+5 56 4.2	−16 37.9	9.574 0652	0.080 2570	0.083 7142

MERCURY.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
ov. 16	169 31 58.5	4 16 50.9	−11 35.3	+5 56 4.2	−16 37.9	9.574 0652	0.080 2570	0.083 7142
17	173 44 47.5	4 8 51.2	12 17.0	5 38 44.9	17 58.2	9.580 7106	0.087 0640	0.090 3091
18	177 49 49.4	4 1 16.8	12 42.3	5 20 12.3	19 4.9	9.587 1954	0.093 4522	0.096 4958
19	181 47 29.8	3 54 8.3	12 52.1	5 0 39.2	19 59.4	9.593 4954	0.099 4423	0.102 2943
20	185 38 14.7	3 47 25.7	12 47.5	4 40 17.0	20 43.3	9.599 5906	0.105 0543	0.107 7246
21	189 22 29.9	3 41 8.8	−12 29.8	+4 19 15.7	−21 17.9	9.605 4650	0.110 3075	0.112 8052
22	193 0 40.7	3 35 16.9	12 0.3	3 57 44.0	21 44.2	9.611 1056	0.115 2200	0.117 5540
23	196 33 11.8	3 29 49.2	11 20.3	3 35 49.7	22 3.3	9.616 5021	0.119 8093	0.121 9878
24	200 0 27.0	3 24 45.0	10 31.3	3 13 39.4	22 16.4	9.621 6466	0.124 0912	0.126 1216
25	203 22 49.4	3 20 3.3	9 34.6	2 51 18.7	22 24.2	9.626 5333	0.128 0807	0.129 9703
26	206 40 40.9	3 15 43.2	− 8 31.3	+2 28 52.6	−22 27.3	9.631 1580	0.131 7920	0.133 5472
27	209 54 22.8	3 11 43.8	7 22.7	2 6 25.5	22 26.4	9.635 5175	0.135 2374	0.136 8641
28	213 4 15.2	3 8 4.2	6 10.0	1 44 0.9	22 22.2	9.639 6097	0.138 4288	0.139 9328
29	216 10 37.4	3 4 43.3	4 54.2	1 21 42.1	22 15.0	9.643 4336	0.141 3773	0.142 7636
30	219 13 47.8	3 1 40.4	3 36.4	0 59 31.8	22 5.2	9.646 9887	0.144 0928	0.145 3659
ec. 1	222 14 4.0	2 58 54.7	− 2 17.3	+0 37 32.4	−21 53.3	9.650 2751	0.146 5839	0.147 7480
2	225 11 42.8	2 56 25.5	− 0 57.8	+0 15 45.9	21 39.5	9.653 2932	0.148 8591	0.149 9181
3	228 7 0.3	2 54 12.1	+ 0 21.2	−0 5 45.9	21 23.9	9.656 0437	0.150 9257	0.151 8828
4	231 0 12.1	2 52 13.9	1 39.0	0 27 1.3	21 6.7	9.658 5275	0.152 7900	0.153 6482
5	233 51 33.0	2 50 30.3	2 55.0	0 47 58.9	20 48.2	9.660 7454	0.154 4580	0.155 2202
6	236 41 17.3	2 49 0.7	+ 4 8.6	−1 8 37.4	−20 28.6	9.662 6984	0.155 9352	0.156 6037
7	239 29 38.9	2 47 44.8	5 19.1	1 28 55.7	20 7.8	9.664 3876	0.157 2261	0.157 8030
8	242 16 51.4	2 46 42.2	6 26.1	1 48 52.7	19 45.9	9.665 8141	0.158 3347	0.158 8217
9	245 3 7.8	2 45 52.7	7 29.1	2 8 27.2	19 23.0	9.666 9785	0.159 2644	0.159 6631
10	247 48 41.0	2 45 15.9	8 27.6	2 27 38.3	18 59.0	9.667 8815	0.160 0180	0.160 3295
11	250 33 43.7	2 44 51.5	+ 9 21.2	−2 46 24.9	−18 33.9	9.668 5237	0.160 5979	0.160 8234
12	253 18 28.2	2 44 39.5	10 9.5	3 4 45.9	18 7.8	9.668 9057	0.161 0061	0.161 1462
13	256 3 6.8	2 44 39.7	10 52.2	3 22 40.2	17 40.6	9.669 0275	0.161 2437	0.161 2988
14	258 47 51.8	2 44 52.2	11 28.8	3 40 6.8	17 12.3	9.668 8894	0.161 3114	0.161 2816
15	261 32 55.3	2 45 16.9	11 59.2	3 57 4.3	16 42.7	9.668 4913	0.161 2094	0.161 0948
16	264 18 29.6	2 45 53.8	+12 23.0	−4 13 31.5	−16 11.6	9.667 8329	0.160 9376	0.160 7377
17	267 4 47.0	2 46 43.1	12 39.9	4 29 26.9	15 39.0	9.666 9138	0.160 4948	0.160 2089
18	269 52 0.0	2 47 44.9	12 49.7	4 44 49.0	15 4.8	9.665 7332	0.159 8796	0.159 5068
19	272 40 21.1	2 48 59.4	12 52.2	4 59 36.0	14 28.9	9.664 2903	0.159 0901	0.158 6292
20	275 30 3.1	2 50 26.9	12 47.3	5 13 46.1	13 51.0	9.662 5846	0.158 1237	0.157 5732
21	278 21 19.3	2 52 7.7	+12 34.7	−5 27 17.2	−13 10.8	9.660 6151	0.156 9772	0.156 3353
22	281 14 23.0	2 54 2.1	12 14.5	5 40 7.0	12 28.3	9.658 3807	0.155 6468	0.154 9113
23	284 9 28.1	2 56 10.5	11 46.4	5 52 12.9	11 43.1	9.655 8805	0.154 1281	0.153 2965
24	287 6 48.9	2 58 33.5	11 10.6	6 3 32.2	10 55.0	9.653 1134	0.152 4158	0.151 4853
25	290 6 40.1	3 1 11.4	10 27.0	6 14 1.9	10 3.7	9.650 0786	0.150 5043	0.149 4719
26	293 9 16.9	3 4 4.8	+ 9 35.8	−6 23 38.5	− 9 8.8	9.646 7754	0.148 3871	0.147 2490
27	296 14 55.2	3 7 14.4	8 37.1	6 32 18.3	8 10.0	9.643 2035	0.146 0566	0.144 8089
28	299 23 51.4	3 10 40.8	7 31.2	6 39 57.2	7 7.0	9.639 3628	0.143 5047	0.142 1430
29	302 36 22.6	3 14 24.6	6 18.6	6 46 30.7	5 59.3	9.635 2539	0.140 7224	0.139 2417
30	305 52 46.6	3 18 26.5	4 59.6	6 51 54.0	4 46.4	9.630 8779	0.137 6995	0.136 0945
31	309 13 21.9	3 22 47.3	+ 3 35.0	−6 56 1.6	− 3 27.9	9.626 2369	0.134 4252	0.132 6900
32	312 38 27.7	3 27 27.6	+ 2 5.5	−6 58 47.7	− 2 3.3	9.621 3339	0.130 8872	0.129 0153

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fro Earth—	
							At Date.	At Intermediate Date
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan. 0	119 14 43.4	1 37 24.9	+3 0.7	+2 19 49.2	+4 11.7	9.856 4263	9.600 1254	9.607 2661
2	122 29 35.2	1 37 26.8	3 0.7	2 27 58.9	3 57.9	9.856 3991	9.614 3728	9.621 4405
4	125 44 30.6	1 37 28.4	2 58.4	2 35 40.2	3 43.3	9.856 3812	9.628 4648	9.635 4418
6	128 59 29.0	1 37 29.8	2 53.8	2 42 51.5	3 27.9	9.856 3728	9.642 3679	9.649 2400
8	132 14 29.8	1 37 30.9	2 47.0	2 49 31.5	3 11.8	9.856 3738	9.656 0556	9.662 8123
10	135 29 32.5	1 37 31.7	+2 38.0	+2 55 38.8	+2 55.2	9.856 3842	9.669 5082	9.676 1417
12	138 44 36.3	1 37 32.1	2 27.0	3 1 12.2	2 38.0	9.856 4041	9.682 7116	9.689 2167
14	141 59 40.7	1 37 32.2	2 14.1	3 6 10.6	2 20.3	9.856 4333	9.695 6565	9.702 0304
16	145 14 45.0	1 37 32.0	1 59.5	3 10 33.1	2 2.1	9.856 4717	9.708 3384	9.714 5803
18	148 29 48.5	1 37 31.4	1 43.3	3 14 18.8	1 43.5	9.856 5193	9.720 7565	9.726 8671
20	151 44 50.6	1 37 30.5	+1 25.8	+3 17 27.0	+1 24.6	9.856 5758	9.732 9125	9.738 8930
22	154 59 50.4	1 37 29.2	1 7.4	3 19 57.1	1 5.4	9.856 6410	9.744 8091	9.750 6610
24	158 14 47.4	1 37 27.6	0 47.8	3 21 48.7	0 46.1	9.856 7148	9.756 4493	9.762 1745
26	161 29 40.8	1 37 25.6	0 27.8	3 23 1.5	0 26.6	9.856 7970	9.767 8372	9.773 4379
28	164 44 29.9	1 37 23.3	+0 7.4	3 23 35.2	+0 7.1	9.856 8871	9.778 9772	9.784 4555
30	167 59 14.0	1 37 20.7	−0 13.1	+3 23 29.8	−0 12.5	9.856 9849	9.789 8735	9.795 2317
Feb. 1	171 13 52.6	1 37 17.7	0 33.4	3 22 45.3	0 32.0	9.857 0902	9.800 5306	9.805 7707
3	174 28 24.8	1 37 14.4	0 53.2	3 21 22.0	0 51.3	9.857 2025	9.810 9526	9.816 0766
5	177 42 50.1	1 37 10.8	1 12.4	3 19 20.2	1 10.4	9.857 3215	9.821 1434	9.826 1533
7	180 57 7.9	1 37 6.9	1 30.6	3 16 40.3	1 29.3	9.857 4469	9.831 1070	9.836 0050
9	184 11 17.7	1 37 2.8	−1 47.7	+3 13 23.0	−1 47.9	9.857 5782	9.840 8482	9.845 6371
11	187 25 18.9	1 36 58.4	2 3.4	3 9 28.9	2 6.1	9.857 7149	9.850 3725	9.855 0551
13	190 39 11.1	1 36 53.7	2 17.5	3 4 58.8	2 23.8	9.857 8566	9.859 6859	9.864 2655
15	193 52 53.8	1 36 48.9	2 29.9	2 59 53.8	2 41.1	9.858 0030	9.868 7949	9.873 2749
17	197 6 26.7	1 36 43.9	2 40.3	2 54 14.8	2 57.8	9.858 1534	9.877 7064	9.882 0902
19	200 19 49.4	1 36 38.8	−2 48.7	+2 48 3.0	−3 13.9	9.858 3074	9.886 4273	9.890 7183
21	203 33 1.7	1 36 33.5	2 55.0	2 41 19.7	3 29.3	9.858 4645	9.894 9641	9.899 1653
23	206 46 3.3	1 36 28.1	2 59.1	2 34 6.2	3 44.0	9.858 6243	9.903 3227	9.907 4369
25	209 58 54.1	1 36 22.7	3 0.9	2 26 23.9	3 58.1	9.858 7862	9.911 5087	9.915 5386
27	213 11 33.9	1 36 17.2	3 0.5	2 18 14.4	4 11.3	9.858 9496	9.919 5273	9.923 4754
Mar. 1	216 24 2.7	1 36 11.7	−2 57.8	+2 9 39.3	−4 23.7	9.859 1142	9.927 3833	9.931 2516
3	219 36 20.5	1 36 6.2	2 52.8	2 0 40.3	4 35.2	9.859 2793	9.935 0806	9.938 8707
5	222 48 27.4	1 36 0.7	2 45.7	1 51 19.1	4 45.9	9.859 4444	9.942 6224	9.946 3359
7	226 0 23.5	1 35 55.4	2 36.6	1 41 37.5	4 55.6	9.859 6091	9.950 0116	9.953 6500
9	229 12 9.0	1 35 50.1	2 25.5	1 31 37.3	5 4.4	9.859 7727	9.957 2513	9.960 8160
11	232 23 44.0	1 35 44.9	−2 12.6	+1 21 20.5	−5 12.2	9.859 9349	9.964 3445	9.967 8373
13	235 35 8.8	1 35 39.9	1 58.0	1 10 49.2	5 19.0	9.860 0950	9.971 2949	9.974 7178
15	238 46 23.7	1 35 35.1	1 42.0	1 0 5.1	5 24.9	9.860 2527	9.978 1066	9.981 4616
17	241 57 29.2	1 35 30.4	1 24.8	0 49 10.3	5 29.7	9.860 4074	9.984 7835	9.988 0728
19	245 8 25.5	1 35 25.9	1 6.6	0 38 6.9	5 33.5	9.860 5586	9.991 3300	9.994 5555
21	248 19 13.1	1 35 21.7	−0 47.5	+0 26 56.9	−5 36.3	9.860 7059	9.997 7498	0.000 9134
23	251 29 52.5	1 35 17.7	0 27.8	0 15 42.3	5 38.1	9.860 8489	0.004 0469	0.007 1507
25	254 40 24.1	1 35 14.0	−0 7.8	+0 4 25.3	5 38.8	9.860 9870	0.010 2252	0.013 2708
27	257 50 48.6	1 35 10.5	+0 12.2	−0 6 52.1	5 38.5	9.861 1199	0.016 2879	0.019 2768
29	261 1 6.3	1 35 7.3	0 32.1	0 18 7.8	5 37.1	9.861 2472	0.022 2377	0.025 1711
31	264 11 17.9	1 35 4.4	+0 51.6	−0 29 19.8	−5 34.7	9.861 3685	0.028 0773	0.030 9564
Apr. 2	267 21 23.8	1 35 1.7	+1 10.4	−0 40 26.1	−5 31.4	9.861 4835	0.033 8087	0.036 6342

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
r. 2	267 21 23.8	1 35 1.7	+1 10.4	−0 40 26.1	−5 31.4	9.861 4835	0.033 8087	0.036 6342
4	270 31 24.8	1 34 59.4	1 28.4	0 51 24.6	5 27.0	9.861 5917	0.039 4331	0.042 2055
6	273 41 21.4	1 34 57.4	1 45.3	1 2 13.3	5 21.6	9.861 6929	0.044 9516	0.047 6716
8	276 51 14.2	1 34 55.6	2 0.9	1 12 50.4	5 15.3	9.861 7868	0.050 3656	0.053 0338
10	280 1 3.7	1 34 54.1	2 15.0	1 23 14.0	5 8.1	9.861 8731	0.055 6765	0.058 2938
12	283 10 50.5	1 34 52.9	+2 27.5	−1 33 22.0	−4 59.9	9.861 9515	0.060 8862	0.063 4537
14	286 20 35.2	1 34 52.0	2 38.2	1 43 12.8	4 50.8	9.862 0218	0.065 9967	0.068 5156
16	289 30 18.4	1 34 51.4	2 46.9	1 52 44.6	4 40.9	9.862 0838	0.071 0104	0.073 4815
18	292 40 0.6	1 34 51.0	2 53.6	2 1 55.7	4 30.1	9.862 1374	0.075 9292	0.078 3539
20	295 49 42.4	1 34 50.9	2 58.2	2 10 44.4	4 18.5	9.862 1823	0.080 7558	0.083 1351
22	298 59 24.2	1 34 51.0	+3 0.6	−2 19 9.1	−4 6.1	9.862 2184	0.085 4920	0.087 8269
24	302 9 6.5	1 34 51.4	3 0.8	2 27 8.4	3 53.0	9.862 2457	0.090 1400	0.092 4315
26	305 18 49.8	1 34 52.0	2 58.9	2 34 40.8	3 39.2	9.862 2640	0.094 7016	0.096 9505
28	308 28 34.6	1 34 52.9	2 54.7	2 41 44.9	3 24.8	9.862 2733	0.099 1785	0.101 3856
30	311 38 21.3	1 34 53.9	2 48.4	2 48 19.5	3 9.7	9.862 2736	0.103 5719	0.105 7375
ay 2	314 48 10.3	1 34 55.1	+2 40.1	−2 54 23.4	−2 54.1	9.862 2649	0.107 8824	0.110 0065
4	317 58 1.8	1 34 56.5	2 29.8	2 59 55.4	2 37.9	9.862 2472	0.112 1099	0.114 1928
6	321 7 56.4	1 34 58.1	2 17.7	3 4 54.6	2 21.3	9.862 2205	0.116 2551	0.118 2968
8	324 17 54.3	1 34 59.8	2 3.9	3 9 20.1	2 4.2	9.862 1849	0.120 3179	0.122 3186
10	327 27 55.8	1 35 1.7	1 48.6	3 13 11.0	1 46.7	9.862 1406	0.124 2990	0.126 2592
12	330 38 1.2	1 35 3.7	+1 32.0	−3 16 26.6	−1 28.9	9.862 0876	0.128 1994	0.130 1195
14	333 48 10.7	1 35 5.8	1 14.2	3 19 6.3	1 10.8	9.862 0262	0.132 0198	0.133 9005
16	336 58 24.6	1 35 8.1	0 55.5	3 21 9.5	0 52.4	9.861 9565	0.135 7617	0.137 6034
18	340 8 43.0	1 35 10.4	0 36.2	3 22 35.9	0 33.9	9.861 8787	0.139 4259	0.141 2293
20	343 19 6.2	1 35 12.8	+0 16.4	3 23 25.2	−0 15.3	9.861 7930	0.143 0138	0.144 7795
22	346 29 34.3	1 35 15.3	−0 3.6	−3 23 37.1	+0 3.4	9.861 6997	0.146 5266	0.148 2553
24	349 40 7.4	1 35 17.9	0 23.6	3 23 11.6	0 22.1	9.861 5992	0.149 9658	0.151 6583
26	352 50 45.7	1 35 20.5	0 43.3	3 22 8.7	0 40.8	9.861 4917	0.153 3328	0.154 9893
28	356 1 29.4	1 35 23.2	1 2.5	3 20 28.5	0 59.3	9.861 3774	0.156 6280	0.158 2489
30	359 12 18.5	1 35 25.9	1 20.9	3 18 11.4	1 17.7	9.861 2567	0.159 8519	0.161 4371
une 1	2 23 13.1	1 35 28.7	−1 38.3	−3 15 17.6	+1 35.9	9.861 1301	0.163 0044	0.164 5539
3	5 34 13.3	1 35 31.5	1 54.5	3 11 47.6	1 53.9	9.860 9979	0.166 0855	0.167 5992
5	8 45 19.2	1 35 34.4	2 9.4	3 7 42.0	2 11.5	9.860 8604	0.169 0950	0.170 5729
7	11 56 30.9	1 35 37.3	2 22.7	3 3 1.5	2 28.8	9.860 7181	0.172 0328	0.173 4747
9	15 7 48.5	1 35 40.3	2 34.2	2 57 46.9	2 45.7	9.860 5715	0.174 8988	0.176 3051
11	18 19 12.0	1 35 43.3	−2 43.7	−2 51 59.1	+3 2.1	9.860 4209	0.177 6935	0.179 0641
13	21 30 41.6	1 35 46.3	2 51.3	2 45 39.0	3 17.9	9.860 2668	0.180 4171	0.181 7526
15	24 42 17.3	1 35 49.4	2 56.8	2 38 47.9	3 33.1	9.860 1098	0.183 0707	0.184 3714
17	27 53 59.1	1 35 52.5	3 0.0	2 31 27.0	3 47.7	9.859 9502	0.185 6548	0.186 9210
19	31 5 47.2	1 35 55.6	3 1.0	2 23 37.5	4 1.7	9.859 7886	0.188 1702	0.189 4025
21	34 17 41.7	1 35 58.8	−2 59.8	−2 15 20.8	+4 14.9	9.859 6254	0.190 6179	0.191 8166
23	37 29 42.7	1 36 2.1	2 56.3	2 6 38.4	4 27.3	9.859 4612	0.192 9988	0.194 1645
25	40 41 50.2	1 36 5.4	2 50.6	1 57 32.0	4 39.0	9.859 2965	0.195 3138	0.196 4469
27	43 54 4.2	1 36 8.7	2 42.8	1 48 3.1	4 49.8	9.859 1319	0.197 5637	0.198 6642
29	47 6 24.9	1 36 12.1	2 33.0	1 38 13.5	4 59.7	9.858 9677	0.199 7484	0.200 8162
July 1	50 18 52.5	1 36 15.5	−2 21.2	−1 28 5.0	+5 8.7	9.858 8046	0.201 8677	0.202 9028
3	53 31 26.9	1 36 18.9	−2 7.6	−1 17 39.4	+5 16.7	9.858 6430	0.203 9214	0.204 9236

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth—	
							At Date.	At Interme diate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 1	50 18 52.5	1 36 15.5	−2 21.2	−1 28 5.0	+5 8.7	9.858 8046	0.201 8677	0.202 90
3	53 31 26.9	1 36 18.9	2 7.6	1 17 39.4	5 16.7	9.858 6430	0.203 9214	0.204 92
5	56 44 8.2	1 36 22.4	1 52.4	1 6 58.8	5 23.7	9.858 4834	0.205 9093	0.206 878
7	59 56 56.6	1 36 25.9	1 35.8	0 56 5.1	5 29.8	9.858 3263	0.207 8312	0.208 767
9	63 9 52.1	1 36 29.5	1 18.0	0 45 0.4	5 34.8	9.858 1724	0.209 6868	0.210 589
11	66 22 54.7	1 36 33.1	−0 59.2	−0 33 46.7	+5 38.7	9.858 0220	0.211 4764	0.212 340
13	69 36 4.5	1 36 36.7	0 39.6	0 22 26.1	5 41.6	9.857 8756	0.213 2005	0.214 038
15	72 49 21.4	1 36 40.3	−0 19.5	−0 11 0.8	5 43.5	9.857 7337	0.214 8596	0.215 664
17	76 2 45.6	1 36 43.9	+0 0.8	+0 0 27.1	5 44.2	9.857 5968	0.216 4542	0.217 227
19	79 16 17.0	1 36 47.5	0 21.1	0 11 55.2	5 43.8	9.857 4653	0.217 9852	0.218 727
21	82 29 55.5	1 36 51.1	+0 41.2	+0 23 21.5	+5 42.3	9.857 3396	0.219 4534	0.220 164
23	85 43 41.1	1 36 54.6	1 0.8	0 34 43.8	5 39.7	9.857 2201	0.220 8599	0.221 540
25	88 57 33.7	1 36 58.0	1 19.6	0 45 59.8	5 36.0	9.857 1073	0.222 2054	0.222 8555
27	92 11 33.2	1 37 1.4	1 37.4	0 57 7.3	5 31.3	9.857 0015	0.223 4905	0.224 1105
29	95 25 39.4	1 37 4.7	1 54.0	1 8 4.2	5 25.5	9.856 9030	0.224 7154	0.225 3052
31	98 39 52.1	1 37 8.0	+2 9.2	+1 18 48.4	+5 18.6	9.856 8122	0.225 8799	0.226 4394
Aug. 2	101 54 11.2	1 37 11.1	2 22.7	1 29 17.8	5 10.6	9.856 7293	0.226 9837	0.227 5128
4	105 8 36.3	1 37 14.0	2 34.3	1 39 30.3	5 1.6	9.856 6547	0.228 0268	0.228 5256
6	108 23 7.1	1 37 16.8	2 44.0	1 49 23.9	4 51.7	9.856 5886	0.229 0093	0.229 4778
8	111 37 43.4	1 37 19.4	2 51.6	1 58 56.6	4 40.8	9.856 5312	0.229 9311	0.230 3692
10	114 52 24.7	1 37 21.8	+2 57.0	+2 8 6.6	+4 29.0	9.856 4827	0.230 7922	0.231 200
12	118 7 10.7	1 37 24.0	3 0.2	2 16 52.1	4 16.3	9.856 4432	0.231 5932	0.231 9713
14	121 22 0.8	1 37 26.0	3 1.0	2 25 11.4	4 2.8	9.856 4130	0.232 3345	0.232 6829
16	124 36 54.7	1 37 27.7	2 59.5	2 33 2.7	3 48.5	9.856 3921	0.233 0167	0.233 3360
18	127 51 51.7	1 37 29.2	2 55.7	2 40 24.6	3 33.4	9.856 3805	0.233 6409	0.233 9316
20	131 6 51.4	1 37 30.4	+2 49.6	+2 47 15.7	+3 17.6	9.856 3783	0.234 2081	0.234 4706
22	134 21 53.1	1 37 31.3	2 41.4	2 53 34.5	3 1.1	9.856 3855	0.234 7193	0.234 9542
24	137 36 56.3	1 37 31.8	2 31.1	2 59 19.8	2 44.1	9.856 4021	0.235 1754	0.235 3829
26	140 52 0.3	1 37 32.0	2 18.8	3 4 30.5	2 26.6	9.856 4281	0.235 5769	0.235 7572
28	144 7 4.4	1 37 31.9	2 4.8	3 9 5.6	2 8.6	9.856 4633	0.235 9239	0.236 0771
30	147 22 7.9	1 37 31.5	+1 49.1	+3 13 4.2	+1 50.1	9.856 5077	0.236 2167	0.236 3427
Sept. 1	150 37 10.2	1 37 30.7	1 32.1	3 16 25.6	1 31.3	9.856 5610	0.236 4551	0.236 5539
3	153 52 10.6	1 37 29.6	1 13.9	3 19 9.1	1 12.2	9.856 6232	0.236 6392	0.236 7109
5	157 7 8.4	1 37 28.1	0 54.7	3 21 14.2	0 52.9	9.856 6939	0.236 7691	0.236 8137
7	160 22 2.8	1 37 26.2	0 34.8	3 22 40.5	0 33.4	9.856 7731	0.236 8448	0.236 8623
9	163 36 53.2	1 37 24.0	+0 14.5	+3 23 27.8	+0 13.9	9.856 8603	0.236 8663	0.236 8568
11	166 51 38.8	1 37 21.5	−0 5.9	3 23 36.1	−0 5.7	9.856 9554	0.236 8339	0.236 7977
13	170 6 19.1	1 37 18.7	0 26.3	3 23 5.3	0 25.2	9.857 0580	0.236 7482	0.236 6856
15	173 20 53.3	1 37 15.5	0 46.4	3 21 55.5	0 44.6	9.857 1677	0.236 6101	0.236 5217
17	176 35 20.9	1 37 12.0	1 5.8	3 20 7.1	1 3.8	9.857 2843	0.236 4205	0.236 3066
19	179 49 41.2	1 37 8.2	−1 24.4	+3 17 40.4	−1 22.8	9.857 4074	0.236 1804	0.236 0419
21	183 3 53.6	1 37 4.1	1 41.9	3 14 36.1	1 41.5	9.857 5365	0.235 8911	0.235 7281
23	186 17 57.6	1 36 59.8	1 58.1	3 10 54.7	1 59.8	9.857 6712	0.235 5529	0.235 3656
25	189 31 52.8	1 36 55.3	2 12.8	3 6 37.1	2 17.7	9.857 8110	0.235 1664	0.234 9552
27	192 45 38.7	1 36 50.5	2 25.8	3 1 44.2	2 35.1	9.857 9556	0.234 7321	0.234 4970
29	195 59 14.9	1 36 45.6	−2 36.9	+2 56 17.0	−2 52.0	9.858 1045	0.234 2500	0.233 9911
Oct. 1	199 12 41.0	1 36 40.5	−2 46.0	+2 50 16.5	−3 8.4	9.858 2572	0.233 7202	0.233 4373

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
ct. 1	199 12 41.0	1 36 40.5	−2 46.0	+2 50 16.5	−3 8.4	9.858 2572	0.233 7202	0.233 4373
3	202 25 56.7	1 36 35.2	2 53.1	2 43 44.0	3 24.0	9.858 4132	0.233 1423	0.232 8353
5	205 39 1.9	1 36 29.9	2 57.9	2 36 40.9	3 39.0	9.858 5719	0.232 5164	0.232 1854
7	208 51 56.3	1 36 24.5	3 0.5	2 29 8.5	3 53.2	9.858 7330	0.231 8424	0.231 4874
9	212 4 39.8	1 36 19.0	3 0.9	2 21 8.3	4 6.7	9.858 8958	0.231 1204	0.230 7413
11	215 17 12.4	1 36 13.5	−2 59.0	+2 12 42.0	−4 19.4	9.859 0599	0.230 3502	0.229 9471
13	218 29 33.9	1 36 8.0	2 54.8	2 3 51.2	4 31.3	9.859 2247	0.229 5322	0.229 1055
15	221 41 44.5	1 36 2.6	2 48.4	1 54 37.5	4 42.3	9.859 3898	0.228 6673	0.228 2176
17	224 53 44.3	1 35 57.2	2 40.0	1 45 2.8	4 52.3	9.859 5546	0.227 7565	0.227 2842
19	228 5 33.3	1 35 51.9	2 29.6	1 35 9.0	5 1.4	9.859 7186	0.226 8007	0.226 3060
21	231 17 11.8	1 35 46.7	−2 17.3	+1 24 57.8	−5 9.6	9.859 8812	0.225 8002	0.225 2834
23	234 28 40.0	1 35 41.6	2 3.3	1 14 31.3	5 16.8	9.860 0421	0.224 7557	0.224 2170
25	237 39 58.3	1 35 36.7	1 47.8	1 3 51.4	5 22.9	9.860 2006	0.223 6674	0.223 1070
27	240 51 6.9	1 35 32.0	1 31.0	0 53 0.1	5 28.1	9.860 3563	0.222 5357	0.221 9536
29	244 2 6.3	1 35 27.5	1 13.0	0 41 59.5	5 32.3	9.860 5088	0.221 3605	0.220 7564
31	247 12 56.8	1 35 23.1	−0 54.2	+0 30 51.6	−5 35.4	9.860 6575	0.220 1413	0.219 5152
Nov. 2	250 23 38.9	1 35 19.0	0 34.7	0 19 38.4	5 37.5	9.860 8020	0.218 8781	0.218 2298
4	253 34 13.0	1 35 15.2	−0 14.8	+0 8 22.0	5 38.6	9.860 9418	0.217 5702	0.216 8993
6	256 44 39.8	1 35 11.7	+0 5.2	−0 2 55.5	5 38.7	9.861 0766	0.216 2171	0.215 5235
8	259 54 59.7	1 35 8.4	0 25.1	0 14 12.0	5 37.7	9.861 2059	0.214 8184	0.214 1018
10	263 5 13.3	1 35 5.3	+0 44.8	−0 25 25.6	−5 35.7	9.861 3293	0.213 3738	0.212 6344
12	266 15 21.1	1 35 2.5	1 3.9	0 36 34.1	5 32.6	9.861 4465	0.211 8836	0.211 1215
14	269 25 23.6	1 35 0.1	1 22.2	0 47 35.5	5 28.6	9.861 5571	0.210 3482	0.209 5637
16	272 35 21.6	1 34 58.0	1 39.5	0 58 27.9	5 23.6	9.861 6608	0.208 7680	0.207 9613
18	275 45 15.5	1 34 56.1	1 55.6	1 9 9.3	5 17.6	9.861 7573	0.207 1436	0.206 3149
20	278 55 6.0	1 34 54.5	+2 10.3	−1 19 37.7	−5 10.7	9.861 8463	0.205 4752	0.204 6246
22	282 4 53.6	1 34 53.2	2 23.3	1 29 51.4	5 2.8	9.861 9275	0.203 7630	0.202 8905
24	285 14 38.9	1 34 52.2	2 34.6	1 39 48.5	4 54.0	9.862 0006	0.202 0071	0.201 1126
26	288 24 22.4	1 34 51.5	2 44.1	1 49 27.1	4 44.4	9.862 0655	0.200 2070	0.199 2903
28	291 34 4.7	1 34 51.0	2 51.5	1 58 45.6	4 33.9	9.862 1220	0.198 3624	0.197 4233
30	294 43 46.4	1 34 50.8	+2 56.8	−2 7 42.3	−4 22.6	9.862 1699	0.196 4728	0.195 5107
Dec. 2	297 53 28.0	1 34 50.9	3 0.0	2 16 15.6	4 10.5	9.862 2091	0.194 5370	0.193 5517
4	301 3 10.0	1 34 51.2	3 1.0	2 24 23.9	3 57.6	9.862 2394	0.192 5546	0.191 5454
6	304 12 52.8	1 34 51.7	2 59.8	2 32 5.8	3 44.1	9.862 2608	0.190 5241	0.189 4905
8	307 22 36.9	1 34 52.5	2 56.4	2 39 20.0	3 29.9	9.862 2732	0.188 4445	0.187 3861
10	310 32 22.8	1 34 53.5	+2 50.9	−2 46 5.1	−3 15.0	9.862 2765	0.186 3152	0.185 2318
12	313 42 10.8	1 34 54.7	2 43.3	2 52 19.8	2 59.6	9.862 2708	0.184 1360	0.183 0276
14	316 52 1.3	1 34 56.0	2 33.6	2 58 3.1	2 43.6	9.862 2561	0.181 9067	0.180 7732
16	320 1 54.7	1 34 57.5	2 22.1	3 3 13.9	2 27.1	9.862 2325	0.179 6273	0.178 4689
18	323 11 51.3	1 34 59.2	2 8.9	3 7 51.2	2 10.2	9.862 1999	0.177 2980	0.176 1145
20	326 21 51.4	1 35 1.0	+1 54.1	−3 11 54.3	−1 52.8	9.862 1584	0.174 9184	0.173 7096
22	329 31 55.3	1 35 3.0	1 37.9	3 15 22.3	1 35.1	9.862 1083	0.172 4881	0.171 2537
24	332 42 3.3	1 35 5.1	1 20.6	3 18 14.6	1 17.1	9.862 0497	0.170 0065	0.168 7463
26	335 52 15.6	1 35 7.3	1 2.2	3 20 30.7	0 58.9	9.861 9827	0.167 4731	0.166 1867
28	339 2 32.4	1 35 9.6	0 43.0	3 22 10.0	0 40.4	9.861 9075	0.164 8869	0.163 5735
30	342 12 53.9	1 35 11.9	+0 23.3	−3 23 12.3	−0 21.8	9.861 8244	0.162 2464	0.160 9055
32	345 23 20.2	1 35 14.4	+0 3.4	−3 23 37.3	−0 3.2	9.861 7336	0.159 5504	0.158 18

MARS.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth—	
								At Date.	At Interm diate Dat
		° ′ ″	′ ″	″	° ′ ″	″			
Jan.	0	275 47 9.4	35 1.44	+53.7	−1 21 3.2	−46.37	0.158 5328	0.384 3051	0.384 05
	2	276 57 18.8	35 7.98	53.5	1 22 35.1	45.49	0.157 8631	0.383 8023	0.383 545
	4	278 7 41.3	35 14.47	53.2	1 24 5.1	44.57	0.157 2011	0.383 2854	0.383 021
	6	279 18 16.7	35 20.90	52.8	1 25 33.3	43.63	0.156 5471	0.382 7547	0.382 484
	8	280 29 4.8	35 27.26	52.4	1 26 59.7	42.67	0.155 9014	0.382 2100	0.381 932
	10	281 40 5.6	35 33.56	+51.8	−1 28 24.0	−41.67	0.155 2643	0.381 6516	0.381 367
	12	282 51 19.0	35 39.78	51.2	1 29 46.3	40.64	0.154 6361	0.381 0794	0.380 788
	14	284 2 44.7	35 45.93	50.4	1 31 6.6	39.58	0.154 0174	0.380 4938	0.380 195
	16	285 14 22.6	35 52.00	49.6	1 32 24.7	38.50	0.153 4082	0.379 8944	0.379 580
	18	286 26 12.6	35 57.99	48.7	1 33 40.5	37.39	0.152 8091	0.379 2822	0.378 971
	20	287 38 14.5	36 3.89	+47.7	−1 34 54.2	−36.25	0.152 2203	0.378 6578	0.378 341
	22	288 50 28.1	36 9.70	46.6	1 36 5.5	35.08	0.151 6423	0.378 0220	0.377 700
	24	290 2 53.3	36 15.41	45.5	1 37 14.5	33.88	0.151 0752	0.377 3755	0.377 048
	26	291 15 29.7	36 21.03	44.2	1 38 21.0	32.66	0.150 5195	0.376 7194	0.376 387
	28	292 28 17.3	36 26.54	42.9	1 39 25.1	31.41	0.149 9754	0.376 0541	0.375 718
	30	293 41 15.8	36 31.95	+41.5	−1 40 26.7	−30.13	0.149 4433	0.375 3804	0.375 040
Feb.	1	294 54 25.1	36 37.25	40.0	1 41 25.7	28.83	0.148 9235	0.374 6985	0.374 354
	3	296 7 44.8	36 42.42	38.4	1 42 22.0	27.51	0.148 4163	0.374 0095	0.373 662
	5	297 21 14.7	36 47.48	36.7	1 43 15.7	26.16	0.147 9221	0.373 3131	0.372 960
	7	298 34 54.6	36 52.41	35.0	1 44 6.6	24.79	0.147 4410	0.372 6090	0.372 254
	9	299 48 44.2	36 57.21	+33.2	−1 44 54.8	−23.40	0.146 9736	0.371 8976	0.371 538
	11	301 2 43.3	37 1.87	31.4	1 45 40.2	21.99	0.146 5199	0.371 1780	0.370 815
	13	302 16 51.6	37 6.41	29.5	1 46 22.8	20.55	0.146 0803	0.370 4505	0.370 083
	15	303 31 8.9	37 10.80	27.5	1 47 2.4	19.09	0.145 6551	0.369 7155	0.369 345
	17	304 45 34.7	37 15.05	25.5	1 47 39.2	17.62	0.145 2445	0.368 9739	0.368 600
	19	306 0 9.0	37 19.15	+23.4	−1 48 12.9	−16.13	0.144 8488	0.368 2259	0.367 840
	21	307 14 51.2	37 23.10	21.3	1 48 43.7	14.62	0.144 4683	0.367 4719	0.367 0029
	23	308 29 41.3	37 26.89	19.1	1 49 11.4	13.10	0.144 1032	0.366 7126	0.366 3312
	25	309 44 38.7	37 30.53	16.9	1 49 36.0	11.56	0.143 7538	0.365 9488	0.365 5655
	27	310 59 43.3	37 34.01	14.7	1 49 57.6	10.01	0.143 4202	0.365 1813	0.364 7961
Mar.	1	312 14 54.6	37 37.32	+12.4	−1 50 16.1	− 8.44	0.143 1028	0.364 4099	0.364 0229
	3	313 30 12.5	37 40.46	10.1	1 50 31.4	6.87	0.142 8017	0.363 6351	0.363 2465
	5	314 45 36.4	37 43.44	7.8	1 50 43.5	5.28	0.142 5171	0.362 8571	0.362 4669
	7	316 1 6.1	37 46.24	5.5	1 50 52.5	3.68	0.142 2493	0.362 0758	0.361 6837
	9	317 16 41.2	37 48.87	3.1	1 50 58.2	2.08	0.141 9982	0.361 2906	0.360 8963
	11	318 32 21.5	37 51.32	+ 0.7	−1 51 0.7	− 0.47	0.141 7644	0.360 5008	0.360 1040
	13	319 48 6.4	37 53.59	− 1.7	1 51 0.1	+ 1.15	0.141 5476	0.359 7060	0.359 3069
	15	321 3 55.7	37 55.68	4.1	1 50 56.1	2.77	0.141 3482	0.358 9067	0.358 5054
	17	322 19 49.0	37 57.58	6.4	1 50 49.0	4.40	0.141 1664	0.358 1029	0.357 6993
	19	323 35 45.9	37 59.30	8.8	1 50 38.5	6.02	0.141 0022	0.357 2947	0.356 8892
	21	324 51 46.1	38 0.83	−11.1	−1 50 24.9	+ 7.65	0.140 8558	0.356 4827	0.356 0752
	23	326 7 49.1	38 2.17	13.4	1 50 7.9	9.27	0.140 7273	0.355 6668	0.355 2576
	25	327 23 54.6	38 3.32	15.7	1 49 47.8	10.88	0.140 6166	0.354 8477	0.354 4371
	27	328 40 2.2	38 4.28	18.0	1 49 24.4	12.49	0.140 5241	0.354 0257	0.353 6133
	29	329 56 11.5	38 5.04	20.2	1 48 57.8	14.10	0.140 4495	0.353 2007	0.352 7875
	31	331 12 22.2	38 5.62	−22.4	−1 48 28.0	+15.71	0.140 3931	0.352 3736	0.351 9589
Apr.	2	332 28 33.9	38 6.00	−24.5	−1 47 54.9	+17.31	0.140 3549	0.351 5435	0.351 1274

MARS.

GREENWICH MEAN NOON.

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							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
r. 2	332 28 33.9	38 6.00	−24.5	−1 47 54.9	+17.31	0.140 3549	0.351 5435	0.351 1274
4	333 44 46.1	38 6.19	26.6	1 47 18.7	18.89	0.140 3348	0.350 7106	0.350 2926
6	335 0 58.5	38 6.18	28.7	1 46 39.3	20.47	0.140 3331	0.349 8734	0.349 4531
8	336 17 10.7	38 5.98	30.7	1 45 56.8	22.04	0.140 3495	0.349 0316	0.348 6088
10	337 33 22.3	38 5.59	32.6	1 45 11.2	23.59	0.140 3842	0.348 1845	0.347 7588
12	338 49 32.8	38 5.00	−34.4	−1 44 22.5	+25.13	0.140 4370	0.347 3316	0.346 9031
14	340 5 42.1	38 4.22	36.2	1 43 30.7	26.65	0.140 5080	0.346 4732	0.346 0416
16	341 21 49.5	38 3.25	37.9	1 42 35.9	28.15	0.140 5971	0.345 6084	0.345 1734
18	342 37 54.9	38 2.08	39.6	1 41 38.1	29.64	0.140 7042	0.344 7369	0.344 2991
20	343 53 57.7	38 0.73	41.2	1 40 37.3	31.11	0.140 8293	0.343 8598	0.343 4189
22	345 9 57.7	37 59.18	−42.7	−1 39 33.7	+32.55	0.140 9722	0.342 9766	0.342 5328
24	346 25 54.3	37 57.45	44.1	1 38 27.1	33.97	0.141 1329	0.342 0875	0.341 6408
26	347 41 47.3	37 55.53	45.4	1 37 17.8	35.38	0.141 3113	0.341 1925	0.340 7428
28	348 57 36.3	37 53.43	46.6	1 36 5.6	36.75	0.141 5072	0.340 2915	0.339 8386
30	350 13 20.9	37 51.15	47.8	1 34 50.8	38.11	0.141 7205	0.339 3840	0.338 9278
ay 2	351 29 0.8	37 48.69	−48.8	−1 33 33.2	+39.44	0.141 9511	0.338 4699	0.338 0096
4	352 44 35.6	37 46.06	49.8	1 32 13.1	40.74	0.142 1988	0.337 5473	0.337 0829
6	354 0 4.9	37 43.25	50.6	1 30 50.3	42.01	0.142 4634	0.336 6162	0.336 1471
8	355 15 28.5	37 40.26	51.3	1 29 25.0	43.26	0.142 7448	0.335 6754	0.335 2009
10	356 30 45.9	37 37.13	51.9	1 27 57.3	44.47	0.143 0426	0.334 7237	0.334 2435
12	357 45 56.9	37 33.81	−52.5	−1 26 27.2	+45.65	0.143 3570	0.333 7604	0.333 2743
14	359 1 1.1	37 30.34	52.9	1 24 54.7	46.80	0.143 6874	0.332 7853	0.332 2932
16	0 15 58.1	37 26.71	53.3	1 23 20.0	47.93	0.144 0338	0.331 7980	0.331 2997
18	1 30 47.8	37 22.91	53.5	1 21 43.0	49.02	0.144 3959	0.330 7982	0.330 2935
20	2 45 29.7	37 18.96	53.7	1 20 3.9	50.08	0.144 7735	0.329 7856	0.329 2745
22	4 0 3.5	37 14.86	−53.7	−1 18 22.7	+51.11	0.145 1662	0.328 7602	0.328 2427
24	5 14 29.0	37 10.61	53.7	1 16 39.5	52.10	0.145 5739	0.327 7219	0.327 1977
26	6 28 45.9	37 6.22	53.5	1 14 54.3	53.06	0.145 9963	0.326 6703	0.326 1394
28	7 42 53.8	37 1.70	53.3	1 13 7.3	53.98	0.146 4332	0.325 6050	0.325 0672
30	8 56 52.6	36 57.04	52.9	1 11 18.4	54.87	0.146 8842	0.324 5257	0.323 9800
une 1	10 10 41.9	36 52.25	−52.5	−1 9 27.8	+55.72	0.147 3491	0.323 4301	0.322 8762
3	11 24 21.5	36 47.33	51.9	1 7 35.5	56.54	0.147 8276	0.322 3180	0.321 7551
5	12 37 51.2	36 42.29	51.3	1 5 41.6	57.32	0.148 3193	0.321 1876	0.320 6154
7	13 51 10.6	36 37.13	50.6	1 3 46.2	58.07	0.148 8241	0.320 0383	0.319 4560
9	15 4 19.6	36 31.85	49.8	1 1 49.3	58.78	0.149 3415	0.318 8685	0.318 2758
11	16 17 17.9	36 26.46	−48.9	−0 59 51.0	+59.46	0.149 8713	0.317 6778	0.317 0744
13	17 30 5.4	36 20.97	47.9	0 57 51.4	60.10	0.150 4131	0.316 4655	0.315 8511
15	18 42 41.7	36 15.37	46.8	0 55 50.6	60.71	0.150 9666	0.315 2311	0.314 6055
17	19 55 6.8	36 9.68	45.6	0 53 48.6	61.29	0.151 5316	0.313 9741	0.313 3369
19	21 7 20.3	36 3.89	44.4	0 51 45.4	61.83	0.152 1076	0.312 6940	0.312 0452
21	22 19 22.3	35 58.01	−43.1	−0 49 41.3	+62.33	0.152 6944	0.311 3907	0.310 7304
23	23 31 12.3	35 52.05	41.7	0 47 36.1	62.80	0.153 2915	0.310 0641	0.309 3919
25	24 42 50.4	35 46.01	40.2	0 45 30.1	63.23	0.153 8989	0.308 7133	0.308 0286
27	25 54 16.3	35 39.89	38.7	0 43 23.3	63.62	0.154 5159	0.307 3375	0.306 6400
29	27 5 29.9	35 33.69	37.1	0 41 15.6	63.98	0.155 1424	0.305 9358	0.305 2247
July 1	28 16 31.0	35 27.42	−35.5	−0 39 7.4	+64.31	0.155 7777	0.304 5065	0.303 7811
3	29 27 19.5	35 21.08	−33.8	−0 36 58.4	+64.60	0.156 4221	0.303 0484	0.30

MARS.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth—	
								At Date.	At Interm diate Dat
		° ′ ″	′ ″	″	° ′ ″	″			
July	1	28 16 31.0	35 27.42	−35.5	−0 39 7.4	+64.31	0.155 7777	0.304 5065	0.303 78
	3	29 27 19.5	35 21.08	33.8	0 36 58.4	64.60	0.156 4221	0.303 0484	0.302 39
	5	30 37 55.3	35 14.68	32.0	0 34 48.9	64.86	0.157 0745	0.301 5593	0.300 80
	7	31 48 18.2	35 8.23	30.2	0 32 39.0	65.08	0.157 7352	0.300 0383	0.299 26
	9	32 58 28.2	35 1.73	28.4	0 30 28.7	65.28	0.158 4035	0.298 4854	0.297 60
	11	34 8 25.1	34 55.18	−26.5	−0 28 17.9	+65.44	0.159 0792	0.296 8985	0.296 00
	13	35 18 8.9	34 48.58	24.6	0 26 6.9	65.57	0.159 7619	0.295 2776	0.294 45
	15	36 27 39.4	34 41.94	22.6	0 23 55.7	65.67	0.160 4512	0.293 6218	0.292 78
	17	37 36 56.6	34 35.26	20.6	0 21 44.2	65.74	0.161 1469	0.291 9301	0.291 07
	19	38 46 0.4	34 28.55	18.6	0 19 32.7	65.78	0.161 8485	0.290 2026	0.289 32
	21	39 54 50.8	34 21.81	−16.6	−0 17 21.2	+65.79	0.162 5558	0.288 4388	0.287 54
	23	41 3 27.7	34 15.04	14.6	0 15 9.6	65.76	0.163 2685	0.286 6380	0.285 72
	25	42 11 51.0	34 8.25	12.5	0 12 58.1	65.71	0.163 9861	0.284 7995	0.283 86
	27	43 20 0.7	34 1.44	10.4	0 10 46.8	65.63	0.164 7084	0.282 9218	0.281 90
	29	44 27 56.7	33 54.62	8.3	0 8 35.6	65.53	0.165 4351	0.281 0030	0.280 02
	31	45 35 39.1	33 47.78	− 6.2	−0 6 24.7	+65.40	0.166 1657	0.279 0432	0.278 04
Aug.	2	46 43 7.8	33 40.93	4.1	0 4 14.1	65.24	0.166 9001	0.277 0391	0.276 02
	4	47 50 22.8	33 34.07	− 2.0	−0 2 3.8	65.05	0.167 6377	0.274 9894	0.273 94
	6	48 57 24.0	33 27.20	+ 0.1	+0 0 6.1	64.84	0.168 3786	0.272 8931	0.271 82
	8	50 4 11.6	33 20.34	2.2	0 2 15.6	64.60	0.169 1219	0.270 7492	0.269 65
	10	51 10 45.4	33 13.48	+ 4.3	+0 4 24.5	+64.34	0.169 8677	0.268 5565	0.267 44
	12	52 17 5.5	33 6.63	6.3	0 6 32.9	64.06	0.170 6158	0.266 3140	0.265 17
	14	53 23 11.9	32 59.80	8.4	0 8 40.8	63.76	0.171 3655	0.264 0212	0.262 85
	16	54 29 4.7	32 52.96	10.4	0 10 47.9	63.43	0.172 1169	0.261 6776	0.260 48
	18	55 34 43.8	32 46.14	12.4	0 12 54.5	63.09	0.172 8694	0.259 2828	0.258 06
	20	56 40 9.3	32 39.34	+14.4	+0 15 0.2	+62.72	0.173 6229	0.256 8358	0.255 59
	22	57 45 21.1	32 32.56	16.4	0 17 5.3	62.33	0.174 3771	0.254 3357	0.253 06
	24	58 50 19.5	32 25.80	18.3	0 19 9.5	61.92	0.175 1316	0.251 7816	0.250 48
	26	59 55 4.4	32 19.07	20.2	0 21 13.0	61.49	0.175 8862	0.249 1720	0.247 84
	28	60 59 35.8	32 12.36	22.0	0 23 15.5	61.04	0.176 6406	0.246 5043	0.245 14
	30	62 3 53.8	32 5.67	+23.8	+0 25 17.1	+60.57	0.177 3945	0.243 7771	0.242 39
Sept.	1	63 7 58.5	31 59.02	25.6	0 27 17.7	60.09	0.178 1477	0.240 9886	0.239 57
	3	64 11 49.9	31 52.39	27.4	0 29 17.4	59.59	0.178 8999	0.238 1377	0.236 68
	5	65 15 28.1	31 45.81	29.1	0 31 16.1	59.07	0.179 6509	0.235 2221	0.233 73
	7	66 18 53.2	31 39.26	30.7	0 33 13.7	58.54	0.180 4004	0.232 2412	0.230 72
	9	67 22 5.2	31 32.76	+32.3	+0 35 10.2	+57.99	0.181 1481	0.229 1933	0.227 64
	11	68 25 4.3	31 26.29	33.8	0 37 5.6	57.43	0.181 8938	0.226 0779	0.224 49
	13	69 27 50.4	31 19.86	35.3	0 38 59.9	56.85	0.182 6373	0.222 8946	0.221 27
	15	70 30 23.8	31 13.49	36.8	0 40 53.0	56.26	0.183 3783	0.219 6426	0.217 90
	17	71 32 44.5	31 7.16	38.2	0 42 44.9	55.66	0.184 1167	0.216 3211	0.214 63
	19	72 34 52.5	31 0.87	+39.5	+0 44 35.5	+55.05	0.184 8521	0.212 9292	0.211 20
	21	73 36 48.0	30 54.64	40.8	0 46 25.1	54.42	0.185 5844	0.209 4657	0.207 70
	23	74 38 31.1	30 48.45	42.0	0 48 13.3	53.78	0.186 3133	0.205 9287	0.204 13
	25	75 40 1.8	30 42.31	43.2	0 50 0.2	53.13	0.187 0387	0.202 3161	0.200 48
	27	76 41 20.4	30 36.23	44.3	0 51 45.8	52.47	0.187 7603	0.198 6261	0.196 75
	29	77 42 26.8	30 30.20	+45.3	+0 53 30.1	+51.80	0.188 4779	0.194 8568	0.192 94
Oct.	1	78 43 21.2	30 24.22	+46.3	+0 55 13.0	+51.11	0.189 1913	0.191 0062	0.189 04

MARS.

GREENWICH MEAN NOON.

ate.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
1	78 43 21.2	30 24.22	+46.3	+0 55 13.0	+51.11	0.189 1913	0.191 0062	0.189 0499
3	79 44 3.7	30 18.30	47.3	0 56 54.5	50.42	0.189 9004	0.187 0726	0.185 0742
5	80 44 34.4	30 12.44	48.2	0 58 34.6	49.72	0.190 6049	0.183 0546	0.181 0135
7	81 44 53.5	30 6.64	49.0	1 0 13.4	49.01	0.191 3047	0.178 9508	0.176 8665
9	82 45 1.0	30 0.91	49.7	1 1 50.7	48.30	0.191 9995	0.174 7604	0.172 6325
11	83 44 57.2	29 55.23	+50.4	+1 3 26.6	+47.58	0.192 6892	0.170 4828	0.168 3111
13	84 44 42.0	29 49.61	51.0	1 5 1.0	46.85	0.193 3736	0.166 1174	0.163 9016
15	85 44 15.7	29 44.06	51.6	1 6 34.0	46.11	0.194 0526	0.161 6637	0.159 4037
17	86 43 38.3	29 38.57	52.1	1 8 5.5	45.37	0.194 7260	0.157 1214	0.154 8164
19	87 42 50.0	29 33.14	52.5	1 9 35.5	44.62	0.195 3936	0.152 4885	0.150 1378
21	88 41 50.9	29 27.78	+52.9	+1 11 3.9	+43.86	0.196 0553	0.147 7638	0.145 3664
23	89 40 41.1	29 22.48	53.2	1 12 30.9	43.10	0.196 7108	0.142 9454	0.140 5004
25	90 39 20.9	29 17.26	53.4	1 13 56.3	42.33	0.197 3601	0.138 0313	0.135 5378
27	91 37 50.2	29 12.09	53.6	1 15 20.2	41.56	0.198 0030	0.133 0199	0.130 4772
29	92 36 9.2	29 7.00	53.7	1 16 42.6	40.78	0.198 6394	0.127 9097	0.125 3170
31	93 34 18.2	29 1.97	+53.8	+1 18 3.3	+40.00	0.199 2692	0.122 6990	0.120 0555
V. 2	94 32 17.1	28 57.01	53.8	1 19 22.6	39.21	0.199 8921	0.117 3864	0.114 6916
4	95 30 6.2	28 52.12	53.7	1 20 40.2	38.42	0.200 5081	0.111 9712	0.109 2251
6	96 27 45.6	28 47.29	53.6	1 21 56.3	37.63	0.201 1170	0.106 4536	0.103 6563
8	97 25 15.5	28 42.54	53.4	1 23 10.7	36.84	0.201 7188	0.100 8333	0.097 9849
10	98 22 35.8	28 37.86	+53.1	+1 24 23.6	+36.04	0.202 3132	0.095 1111	0.092 2120
12	99 19 47.0	28 33.26	52.8	1 25 34.9	35.24	0.202 9003	0.089 2878	0.086 3384
14	100 16 48.9	28 28.72	52.4	1 26 44.6	34.44	0.203 4797	0.083 3639	0.080 3646
16	101 13 41.9	28 24.26	52.0	1 27 52.6	33.63	0.204 0516	0.077 3402	0.074 2906
18	102 10 26.0	28 19.87	51.5	1 28 59.1	32.82	0.204 6156	0.071 2158	0.068 1158
20	103 7 1.4	28 15.55	+51.0	+1 30 3.9	+32.01	0.205 1718	0.064 9904	0.061 8401
22	104 3 28.2	28 11.30	50.4	1 31 7.1	31.20	0.205 7200	0.058 6650	0.055 4648
24	104 59 46.7	28 7.13	49.8	1 32 8.7	30.38	0.206 2602	0.052 2398	0.048 9899
26	105 55 56.8	28 3.03	49.1	1 33 8.7	29.57	0.206 7921	0.045 7154	0.042 4164
28	106 51 58.9	27 59.00	48.4	1 34 7.0	28.75	0.207 3159	0.039 0930	0.035 7455
30	107 47 52.9	27 55.05	+47.6	+1 35 3.7	+27.94	0.207 8312	0.032 3743	0.028 9802
ec. 2	108 43 39.1	27 51.17	46.7	1 35 58.7	27.12	0.208 3382	0.025 5637	0.022 1245
4	109 39 17.6	27 47.36	45.8	1 36 52.1	26.30	0.208 8366	0.018 6637	0.015 1819
6	110 34 48.6	27 43.63	44.9	1 37 43.9	25.48	0.209 3265	0.011 6800	0.008 1583
8	111 30 12.2	27 39.97	43.9	1 38 34.1	24.66	0.209 8076	0.004 6185	0.001 0613
10	112 25 28.5	27 36.39	+42.9	+1 39 22.6	+23.84	0.210 2800	9.997 4873	9.993 8973
12	113 20 37.8	27 32.88	41.9	1 40 9.4	23.02	0.210 7436	9.990 2925	9.986 6741
14	114 15 40.1	27 29.45	40.8	1 40 54.7	22.20	0.211 1982	9.983 0428	9.979 3995
16	115 10 35.6	27 26.09	39.7	1 41 38.2	21.38	0.211 6438	9.975 7452	9.972 0815
18	116 5 24.5	27 22.81	38.5	1 42 20.2	20.56	0.212 0804	9.968 4092	9.964 7297
20	117 0 6.9	27 19.59	+37.3	+1 43 0.5	+19.74	0.212 5078	9.961 0445	9.957 3547
22	117 54 42.9	27 16.46	36.0	1 43 39.2	18.92	0.212 9260	9.953 6619	9.949 9680
24	118 49 12.8	27 13.41	34.7	1 44 16.2	18.10	0.213 3350	9.946 2746	9.942 5831
26	119 43 36.6	27 10.41	33.4	1 44 51.6	17.29	0.213 7348	9.938 8958	9.935 2150
28	120 37 54.5	27 7.49	32.0	1 45 25.3	16.47	0.214 1251	9.931 5426	9.927 8809
30	121 32 6.6	27 4.66	+30.6	+1 45 57.5	+15.65	0.214 5060	9.924 2326	9.920 6005
32	122 26 13.2	27 1.91	+29.2	+1 46 28.0	+14.83	0.214 8774	9.916 9874	9.913 3960

MERCURY.

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	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Oct. 1	299 17 47.0	3 10 34.0	+ 7 33.4	−6 39 44.0	− 7 9.0	9.639 4862	9.968 8289	9.964 83
2	302 30 11.2	3 14 17.2	6 20.9	6 46 19.6	6 1.4	9.635 3857	9.960 7848	9.956 677
3	305 46 27.7	3 18 18.6	5 2.2	6 51 45.1	4 48.6	9.631 0180	9.952 5156	9.948 20
4	309 6 54.9	3 22 38.8	3 37.7	6 55 55.1	3 30.3	9.626 3851	9.944 0318	9.939 71
5	312 31 51.9	3 27 18.5	2 8.4	6 58 43.8	2 6.0	9.621 4902	9.935 3485	9.930 93
6	316 1 38.6	3 32 18.4	+ 0 35.0	−7 0 4.9	− 0 35.1	9.616 3377	9.926 4869	9.921 99
7	319 36 35.6	3 37 39.2	− 1 1.1	6 59 51.7	+ 1 2.8	9.610 9334	9.917 4756	9.912 925
8	323 17 4.2	3 43 21.5	2 38.7	6 57 56.9	2 48.2	9.605 2853	9.908 3530	9.903 76
9	327 3 26.0	3 49 25.8	4 16.2	6 54 12.7	4 41.5	9.599 4038	9.899 1686	9.894 572
10	330 56 3.2	3 55 52.4	5 51.9	6 48 31.1	6 43.1	9.593 3019	9.889 9848	9.885 417
11	334 55 18.4	4 2 41.7	− 7 23.6	−6 40 43.7	+ 8 53.3	9.586 9958	9.880 8799	9.876 386
12	339 1 34.1	4 9 53.4	8 49.1	6 30 41.8	11 12.1	9.580 5054	9.871 9489	9.867 583
13	343 15 12.5	4 17 27.1	10 5.9	6 18 16.7	13 39.5	9.573 8553	9.863 3065	9.859 134
14	347 36 35.4	4 25 22.0	11 11.3	6 3 20.1	16 15.1	9.567 0750	9.855 0875	9.851 1845
15	352 6 3.2	4 33 36.8	12 2.6	5 45 43.9	18 58.4	9.560 1994	9.847 4470	9.843 897
16	356 43 55.0	4 42 9.5	−12 37.1	−5 25 21.1	+21 48.2	9.553 2696	9.840 5584	9.837 4544
17	1 30 27.3	4 50 57.4	12 51.9	5 2 5.9	24 42.9	9.546 3337	9.834 6094	9.832 0481
18	6 25 53.6	4 59 56.8	12 44.8	4 35 54.5	27 40.2	9.539 4467	9.829 7951	9.827 8743
19	11 30 23.2	5 9 3.3	12 13.9	4 6 45.6	30 37.3	9.532 6708	9.826 3085	9.825 1196
20	16 44 0.6	5 18 11.1	11 18.0	3 34 41.1	33 30.7	9.526 0757	9.824 3275	9.823 9498
21	22 6 43.7	5 27 13.6	− 9 56.9	−2 59 46.9	+36 15.9	9.519 7376	9.824 0013	9.824 4938
22	27 38 23.5	5 36 3.0	8 11.5	2 22 13.6	38 47.9	9.513 7382	9.825 4357	9.826 8316
23	33 18 42.3	5 44 30.3	6 4.3	1 42 17.2	41 1.3	9.508 1636	9.828 6820	9.830 9835
24	39 7 13.3	5 52 25.6	3 39.2	1 0 19.2	42 50.1	9.503 1017	9.833 7284	9.836 9052
25	45 3 19.3	5 59 38.4	− 1 1.6	−0 16 47.1	44 8.5	9.498 6393	9.840 4986	9.844 4900
26	51 6 12.5	6 5 58.2	+ 1 41.7	+0 27 46.0	+44 51.3	9.494 8591	9.848 8575	9.853 5765
27	57 14 54.7	6 11 14.6	4 22.9	1 12 42.2	44 54.1	9.491 8357	9.858 6202	9.863 9602
28	63 28 17.5	6 15 18.0	6 53.7	1 57 19.9	44 14.0	9.489 6319	9.869 5670	9.875 4102
29	69 45 3.7	6 18 0.2	9 6.0	2 40 55.6	42 49.8	9.488 2955	9.881 4594	9.887 6842
30	76 3 49.1	6 19 15.3	10 52.4	3 22 45.3	40 42.6	9.487 8562	9.894 0549	9.900 5426
31	82 23 4.6	6 19 0.1	+12 7.1	+4 2 7.5	+37 55.4	9.488 3240	9.907 1196	9.913 7598
Nov. 1	88 41 19.4	6 17 14.0	12 46.4	4 38 24.6	34 33.3	9.489 6881	9.920 4387	9.927 1334
2	94 57 3.4	6 13 59.3	12 48.8	5 11 4.8	30 42.9	9.491 9182	9.933 8228	9.940 4876
3	101 8 50.7	6 9 21.6	12 15.2	5 39 43.5	26 31.7	9.494 9663	9.947 1104	9.953 6756
4	107 15 21.9	6 3 28.7	11 8.6	6 4 3.9	22 7.6	9.498 7690	9.960 1693	9.966 5793
5	113 15 26.4	5 56 30.2	+ 9 33.9	+6 23 57.1	+17 38.6	9.503 2514	9.972 8951	9.979 1076
6	119 8 4.1	5 48 37.1	7 36.9	6 39 21.8	13 11.8	9.508 3307	9.985 2092	9.991 1934
7	124 52 26.3	5 40 1.1	5 24.3	6 50 23.3	8 53.1	9.513 9198	9.997 0549	0.002 7895
8	130 27 55.8	5 30 53.6	3 2.7	6 57 12.3	4 47.4	9.519 9310	0.008 3942	0.013 8667
9	135 54 6.7	5 21 25.6	+ 0 38.4	7 0 3.6	+ 0 58.3	9.526 2784	0.019 2056	0.024 4100
10	141 10 43.4	5 11 47.0	− 1 43.0	+6 59 15.2	− 2 31.8	9.532 8803	0.029 4796	0.034 4147
11	146 17 40.0	5 2 6.6	3 56.8	6 55 6.7	5 41.7	9.539 6606	0.039 2161	0.043 8849
12	151 14 58.5	4 52 31.8	5 59.4	6 47 58.5	8 31.2	9.546 5500	0.048 4227	0.052 8313
13	156 2 47.5	4 43 8.6	7 48.0	6 38 11.0	11 0.6	9.553 4864	0.057 1125	0.061 2686
14	160 41 21.1	4 34 1.7	9 20.7	6 26 3.8	13 10.6	9.560 4151	0.065 3019	0.069 2149
15	165 10 57.6	4 25 14.9	−10 36.6	+6 11 55.8	−15 2.5	9.567 2884	0.073 0100	0.076 6898
16	169 31 58.5	4 16 50.9	−11 35.3	+5 56 4.2	−16 37.9	9.574 0652	0.080 2570	0.083 7142

MERCURY.

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v. 16	169 31 58.5	4 16 50.9	−11 35.3	+5 56 4.2	−16 37.9	9.574 0652	0.080 2570	0.083 7142
17	173 44 47.5	4 8 51.2	12 17.0	5 38 44.9	17 58.2	9.580 7106	0.087 0640	0.090 3091
18	177 49 49.4	4 1 16.8	12 42.3	5 20 12.3	19 4.9	9.587 1954	0.093 4522	0.096 4958
19	181 47 29.8	3 54 8.3	12 52.1	5 0 39.2	19 59.4	9.593 4954	0.099 4423	0.102 2943
20	185 38 14.7	3 47 25.7	12 47.5	4 40 17.0	20 43.3	9.599 5906	0.105 0543	0.107 7246
21	189 22 29.9	3 41 8.8	−12 29.8	+4 19 15.7	−21 17.9	9.605 4650	0.110 3075	0.112 8052
22	193 0 40.7	3 35 16.9	12 0.3	3 57 44.0	21 44.2	9.611 1056	0.115 2200	0.117 5540
23	196 33 11.8	3 29 49.2	11 20.3	3 35 49.7	22 3.3	9.616 5021	0.119 8093	0.121 9878
24	200 0 27.0	3 24 45.0	10 31.3	3 13 39.4	22 16.4	9.621 6466	0.124 0912	0.126 1216
25	203 22 49.4	3 20 3.3	9 34.6	2 51 18.7	22 24.2	9.626 5333	0.128 0807	0.129 9703
26	206 40 40.9	3 15 43.2	− 8 31.3	+2 28 52.6	−22 27.3	9.631 1580	0.131 7920	0.133 5472
27	209 54 22.8	3 11 43.8	7 22.7	2 6 25.5	22 26.4	9.635 5175	0.135 2374	0.136 8641
28	213 4 15.2	3 8 4.2	6 10.0	1 44 0.9	22 22.2	9.639 6097	0.138 4288	0.139 9328
29	216 10 37.4	3 4 43.3	4 54.2	1 21 42.1	22 15.0	9.643 4336	0.141 3773	0.142 7636
30	219 13 47.8	3 1 40.4	3 36.4	0 59 31.8	22 5.2	9.646 9887	0.144 0928	0.145 3659
ec. 1	222 14 4.0	2 58 54.7	− 2 17.3	+0 37 32.4	−21 53.3	9.650 2751	0.146 5839	0.147 7480
2	225 11 42.8	2 56 25.5	− 0 57.8	+0 15 45.9	21 39.5	9.653 2932	0.148 8591	0.149 9181
3	228 7 0.3	2 54 12.1	+ 0 21.2	−0 5 45.9	21 23.9	9.656 0437	0.150 9257	0.151 8828
4	231 0 12.1	2 52 13.9	1 39.0	0 27 1.3	21 6.7	9.658 5275	0.152 7900	0.153 6482
5	233 51 33.0	2 50 30.3	2 55.0	0 47 58.9	20 48.2	9.660 7454	0.154 4580	0.155 2202
6	236 41 17.3	2 49 0.7	+ 4 8.6	−1 8 37.4	−20 28.6	9.662 6984	0.155 9352	0.156 6037
7	239 29 38.9	2 47 44.8	5 19.1	1 28 55.7	20 7.8	9.664 3876	0.157 2261	0.157 8030
8	242 16 51.4	2 46 42.2	6 26.1	1 48 52.7	19 45.9	9.665 8141	0.158 3347	0.158 8217
9	245 3 7.8	2 45 52.7	7 29.1	2 8 27.2	19 23.0	9.666 9785	0.159 2644	0.159 6631
10	247 48 41.0	2 45 15.9	8 27.6	2 27 38.3	18 59.0	9.667 8815	0.160 0180	0.160 3295
11	250 33 43.7	2 44 51.5	+ 9 21.2	−2 46 24.9	−18 33.9	9.668 5237	0.160 5979	0.160 8234
12	253 18 28.2	2 44 39.5	10 9.5	3 4 45.9	18 7.8	9.668 9057	0.161 0061	0.161 1462
13	256 3 6.8	2 44 39.7	10 52.2	3 22 40.2	17 40.6	9.669 0275	0.161 2437	0.161 2988
14	258 47 51.8	2 44 52.2	11 28.8	3 40 6.8	17 12.3	9.668 8894	0.161 3114	0.161 2816
15	261 32 55.3	2 45 16.9	11 59.2	3 57 4.3	16 42.7	9.668 4913	0.161 2094	0.161 0948
16	264 18 29.6	2 45 53.8	+12 23.0	−4 13 31.5	−16 11.6	9.667 8329	0.160 9376	0.160 7377
17	267 4 47.0	2 46 43.1	12 39.9	4 29 26.9	15 39.0	9.666 9138	0.160 4948	0.160 2089
18	269 52 0.0	2 47 44.9	12 49.7	4 44 49.0	15 4.8	9.665 7332	0.159 8796	0.159 5068
19	272 40 21.1	2 48 59.4	12 52.2	4 59 36.0	14 28.9	9.664 2903	0.159 0901	0.158 6292
20	275 30 3.1	2 50 26.9	12 47.3	5 13 46.1	13 51.0	9.662 5846	0.158 1237	0.157 5732
21	278 21 19.3	2 52 7.7	+12 34.7	−5 27 17.2	−13 10.8	9.660 6151	0.156 9772	0.156 3353
22	281 14 23.0	2 54 2.1	12 14.5	5 40 7.0	12 28.3	9.658 3807	0.155 6468	0.154 9113
23	284 9 28.1	2 56 10.5	11 46.4	5 52 12.9	11 43.1	9.655 8805	0.154 1281	0.153 2965
24	287 6 48.9	2 58 33.5	11 10.6	6 3 32.2	10 55.0	9.653 1134	0.152 4158	0.151 4853
25	290 6 40.1	3 1 11.4	10 27.0	6 14 1.9	10 3.7	9.650 0786	0.150 5043	0.149 4719
26	293 9 16.9	3 4 4.8	+ 9 35.8	−6 23 38.5	− 9 8.8	9.646 7754	0.148 3871	0.147 2490
27	296 14 55.2	3 7 14.4	8 37.1	6 32 18.3	8 10.0	9.643 2035	0.146 0566	0.144 8089
28	299 23 51.4	3 10 40.8	7 31.2	6 39 57.2	7 7.0	9.639 3628	0.143 5047	0.142 1430
29	302 36 22.6	3 14 24.6	6 18.6	6 46 30.7	5 59.3	9.635 2539	0.140 7224	0.139 2417
30	305 52 46.6	3 18 26.5	4 59.6	6 51 54.0	4 46.4	9.630 8779	0.137 6995	0.136 0945
31	309 13 21.9	3 22 47.3	+ 3 35.0	−6 56 1.6	− 3 27.9	9.626 2369	0.134 4252	0.132 6900
32	312 38 27.7	3 27 27.6	+ 2 5.5	−6 58 47.7	− 2 3.3	9.621 3339	0.130 8872	0.129 [illegible]

VENUS.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
								At Date.	At Intermediate Date
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
Jan.	0	119 14 43.4	1 37 24.9	+3 0.7	+2 19 49.2	+4 11.7	9.856 4263	9.600 1254	9.607 2661
	2	122 29 35.2	1 37 26.8	3 0.7	2 27 58.9	3 57.9	9.856 3991	9.614 3728	9.621 4405
	4	125 44 30.6	1 37 28.4	2 58.4	2 35 40.2	3 43.3	9.856 3812	9.628 4648	9.635 4418
	6	128 59 29.0	1 37 29.8	2 53.8	2 42 51.5	3 27.9	9.856 3728	9.642 3679	9.649 2400
	8	132 14 29.8	1 37 30.9	2 47.0	2 49 31.5	3 11.8	9.856 3738	9.656 0556	9.662 8123
	10	135 29 32.5	1 37 31.7	+2 38.0	+2 55 38.8	+2 55.2	9.856 3842	9.669 5082	9.676 1417
	12	138 44 36.3	1 37 32.1	2 27.0	3 1 12.2	2 38.0	9.856 4041	9.682 7116	9.689 2167
	14	141 59 40.7	1 37 32.2	2 14.1	3 6 10.6	2 20.3	9.856 4333	9.695 6565	9.702 0304
	16	145 14 45.0	1 37 32.0	1 59.5	3 10 33.1	2 2.1	9.856 4717	9.708 3384	9.714 5803
	18	148 29 48.5	1 37 31.4	1 43.3	3 14 18.8	1 43.5	9.856 5193	9.720 7565	9.726 8671
	20	151 44 50.6	1 37 30.5	+1 25.8	+3 17 27.0	+1 24.6	9.856 5758	9.732 9125	9.738 8930
	22	154 59 50.4	1 37 29.2	1 7.4	3 19 57.1	1 5.4	9.856 6410	9.744 8091	9.750 6610
	24	158 14 47.4	1 37 27.6	0 47.8	3 21 48.7	0 46.1	9.856 7148	9.756 4493	9.762 1745
	26	161 29 40.8	1 37 25.6	0 27.8	3 23 1.5	0 26.6	9.856 7970	9.767 8372	9.773 4379
	28	164 44 29.9	1 37 23.3	+0 7.4	3 23 35.2	+0 7.1	9.856 8871	9.778 9772	9.784 4555
	30	167 59 14.0	1 37 20.7	−0 13.1	+3 23 29.8	−0 12.5	9.856 9849	9.789 8735	9.795 2317
Feb.	1	171 13 52.6	1 37 17.7	0 33.4	3 22 45.3	0 32.0	9.857 0902	9.800 5306	9.805 7707
	3	174 28 24.8	1 37 14.4	0 53.2	3 21 22.0	0 51.3	9.857 2025	9.810 9526	9.816 0766
	5	177 42 50.1	1 37 10.8	1 12.4	3 19 20.2	1 10.4	9.857 3215	9.821 1434	9.826 1533
	7	180 57 7.9	1 37 6.9	1 30.6	3 16 40.3	1 29.3	9.857 4469	9.831 1070	9.836 0050
	9	184 11 17.7	1 37 2.8	−1 47.7	+3 13 23.0	−1 47.9	9.857 5782	9.840 8482	9.845 6371
	11	187 25 18.9	1 36 58.4	2 3.4	3 9 28.9	2 6.1	9.857 7149	9.850 3725	9.855 0551
	13	190 39 11.1	1 36 53.7	2 17.5	3 4 58.8	2 23.8	9.857 8566	9.859 6859	9.864 2655
	15	193 52 53.8	1 36 48.9	2 29.9	2 59 53.8	2 41.1	9.858 0030	9.868 7949	9.873 2749
	17	197 6 26.7	1 36 43.9	2 40.3	2 54 14.8	2 57.8	9.858 1534	9.877 7064	9.882 0902
	19	200 19 49.4	1 36 38.8	−2 48.7	+2 48 3.0	−3 13.9	9.858 3074	9.886 4273	9.890 7183
	21	203 33 1.7	1 36 33.5	2 55.0	2 41 19.7	3 29.3	9.858 4645	9.894 9641	9.899 1653
	23	206 46 3.3	1 36 28.1	2 59.1	2 34 6.2	3 44.0	9.858 6243	9.903 3227	9.907 4369
	25	209 58 54.1	1 36 22.7	3 0.9	2 26 23.9	3 58.1	9.858 7862	9.911 5087	9.915 5386
	27	213 11 33.9	1 36 17.2	3 0.5	2 18 14.4	4 11.3	9.858 9496	9.919 5273	9.923 4754
Mar.	1	216 24 2.7	1 36 11.7	−2 57.8	+2 9 39.3	−4 23.7	9.859 1142	9.927 3833	9.931 2516
	3	219 36 20.5	1 36 6.2	2 52.8	2 0 40.3	4 35.2	9.859 2793	9.935 0806	9.938 8707
	5	222 48 27.4	1 36 0.7	2 45.7	1 51 19.1	4 45.9	9.859 4444	9.942 6224	9.946 3359
	7	226 0 23.5	1 35 55.4	2 36.6	1 41 37.5	4 55.6	9.859 6091	9.950 0116	9.953 6500
	9	229 12 9.0	1 35 50.1	2 25.5	1 31 37.3	5 4.4	9.859 7727	9.957 2513	9.960 8160
	11	232 23 44.0	1 35 44.9	−2 12.6	+1 21 20.5	−5 12.2	9.859 9349	9.964 3445	9.967 8373
	13	235 35 8.8	1 35 39.9	1 58.0	1 10 49.2	5 19.0	9.860 0950	9.971 2949	9.974 7178
	15	238 46 23.7	1 35 35.1	1 42.0	1 0 5.1	5 24.9	9.860 2527	9.978 1066	9.981 4616
	17	241 57 29.2	1 35 30.4	1 24.8	0 49 10.3	5 29.7	9.860 4074	9.984 7835	9.988 0728
	19	245 8 25.5	1 35 25.9	1 6.6	0 38 6.9	5 33.5	9.860 5586	9.991 3300	9.994 5555
	21	248 19 13.1	1 35 21.7	−0 47.5	+0 26 56.9	−5 36.3	9.860 7059	9.997 7498	0.000 9134
	23	251 29 52.5	1 35 17.7	0 27.8	0 15 42.3	5 38.1	9.860 8489	0.004 0469	0.007 1507
	25	254 40 24.1	1 35 14.0	−0 7.8	+0 4 25.3	5 38.8	9.860 9870	0.010 2252	0.013 2708
	27	257 50 48.6	1 35 10.5	+0 12.2	−0 6 52.1	5 38.5	9.861 1199	0.016 2879	0.019 2768
	29	261 1 6.3	1 35 7.3	0 32.1	0 18 7.8	5 37.1	9.861 2472	0.022 2377	0.025 1711
	31	264 11 17.9	1 35 4.4	+0 51.6	−0 29 19.8	−5 34.7	9.861 3685	0.028 0773	0.030 9564
Apr.	2	267 21 23.8	1 35 1.7	+1 10.4	−0 40 26.1	−5 31.4	9.861 4835	0.033 8087	0.036 6342

VENUS.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
								At Date.	At Intermediate Date.
		° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
pr.	2	267 21 23.8	1 35 1.7	+1 10.4	−0 40 26.1	−5 31.4	9.861 4835	0.033 8087	0.036 6342
	4	270 31 24.8	1 34 59.4	1 28.4	0 51 24.6	5 27.0	9.861 5917	0.039 4331	0.042 2055
	6	273 41 21.4	1 34 57.4	1 45.3	1 2 13.3	5 21.6	9.861 6929	0.044 9516	0.047 6716
	8	276 51 14.2	1 34 55.6	2 0.9	1 12 50.4	5 15.3	9.861 7868	0.050 3656	0.053 0338
	10	280 1 3.7	1 34 54.1	2 15.0	1 23 14.0	5 8.1	9.861 8731	0.055 6765	0.058 2938
	12	283 10 50.5	1 34 52.9	+2 27.5	−1 33 22.0	−4 59.9	9.861 9515	0.060 8862	0.063 4537
	14	286 20 35.2	1 34 52.0	2 38.2	1 43 12.8	4 50.8	9.862 0218	0.065 9967	0.068 5156
	16	289 30 18.4	1 34 51.4	2 46.9	1 52 44.6	4 40.9	9.862 0838	0.071 0104	0.073 4815
	18	292 40 0.6	1 34 51.0	2 53.6	2 1 55.7	4 30.1	9.862 1374	0.075 9292	0.078 3539
	20	295 49 42.4	1 34 50.9	2 58.2	2 10 44.4	4 18.5	9.862 1823	0.080 7558	0.083 1351
	22	298 59 24.2	1 34 51.0	+3 0.6	−2 19 9.1	−4 6.1	9.862 2184	0.085 4920	0.087 8269
	24	302 9 6.5	1 34 51.4	3 0.8	2 27 8.4	3 53.0	9.862 2457	0.090 1400	0.092 4315
	26	305 18 49.8	1 34 52.0	2 58.9	2 34 40.8	3 39.2	9.862 2640	0.094 7016	0.096 9505
	28	308 28 34.6	1 34 52.9	2 54.7	2 41 44.9	3 24.8	9.862 2733	0.099 1785	0.101 3856
	30	311 38 21.3	1 34 53.9	2 48.4	2 48 19.5	3 9.7	9.862 2736	0.103 5719	0.105 7375
ay	2	314 48 10.3	1 34 55.1	+2 40.1	−2 54 23.4	−2 54.1	9.862 2649	0.107 8824	0.110 0065
	4	317 58 1.8	1 34 56.5	2 29.8	2 59 55.4	2 37.9	9.862 2472	0.112 1099	0.114 1928
	6	321 7 56.4	1 34 58.1	2 17.7	3 4 54.6	2 21.3	9.862 2205	0.116 2551	0.118 2968
	8	324 17 54.3	1 34 59.8	2 3.9	3 9 20.1	2 4.2	9.862 1849	0.120 3179	0.122 3186
	10	327 27 55.8	1 35 1.7	1 48.6	3 13 11.0	1 46.7	9.862 1406	0.124 2990	0.126 2592
	12	330 38 1.2	1 35 3.7	+1 32.0	−3 16 26.6	−1 28.9	9.862 0876	0.128 1994	0.130 1195
	14	333 48 10.7	1 35 5.8	1 14.2	3 19 6.3	1 10.8	9.862 0262	0.132 0198	0.133 9005
	16	336 58 24.6	1 35 8.1	0 55.5	3 21 9.5	0 52.4	9.861 9565	0.135 7617	0.137 6034
	18	340 8 43.0	1 35 10.4	0 36.2	3 22 35.9	0 33.9	9.861 8787	0.139 4259	0.141 2293
	20	343 19 6.2	1 35 12.8	+0 16.4	3 23 25.2	−0 15.3	9.861 7930	0.143 0138	0.144 7795
	22	346 29 34.3	1 35 15.3	−0 3.6	−3 23 37.1	+0 3.4	9.861 6997	0.146 5266	0.148 2553
	24	349 40 7.4	1 35 17.9	0 23.6	3 23 11.6	0 22.1	9.861 5992	0.149 9658	0.151 6583
	26	352 50 45.7	1 35 20.5	0 43.3	3 22 8.7	0 40.8	9.861 4917	0.153 3328	0.154 9893
	28	356 1 29.4	1 35 23.2	1 2.5	3 20 28.5	0 59.3	9.861 3774	0.156 6280	0.158 2489
	30	359 12 18.5	1 35 25.9	1 20.9	3 18 11.4	1 17.7	9.861 2567	0.159 8519	0.161 4371
June	1	2 23 13.1	1 35 28.7	−1 38.3	−3 15 17.6	+1 35.9	9.861 1301	0.163 0044	0.164 5539
	3	5 34 13.3	1 35 31.5	1 54.5	3 11 47.6	1 53.9	9.860 9979	0.166 0855	0.167 5992
	5	8 45 19.2	1 35 34.4	2 9.4	3 7 42.0	2 11.5	9.860 8604	0.169 0950	0.170 5729
	7	11 56 30.9	1 35 37.3	2 22.7	3 3 1.5	2 28.8	9.860 7181	0.172 0328	0.173 4747
	9	15 7 48.5	1 35 40.3	2 34.2	2 57 46.9	2 45.7	9.860 5715	0.174 8988	0.176 3051
	11	18 19 12.0	1 35 43.3	−2 43.7	−2 51 59.1	+3 2.1	9.860 4209	0.177 6935	0.179 0641
	13	21 30 41.6	1 35 46.3	2 51.3	2 45 39.0	3 17.9	9.860 2668	0.180 4171	0.181 7526
	15	24 42 17.3	1 35 49.4	2 56.8	2 38 47.9	3 33.1	9.860 1098	0.183 0707	0.184 3714
	17	27 53 59.1	1 35 52.5	3 0.0	2 31 27.0	3 47.7	9.859 9502	0.185 6548	0.186 9210
	19	31 5 47.2	1 35 55.6	3 1.0	2 23 37.5	4 1.7	9.859 7886	0.188 1702	0.189 4025
	21	34 17 41.7	1 35 58.8	−2 59.8	−2 15 20.8	+4 14.9	9.859 6254	0.190 6179	0.191 8166
	23	37 29 42.7	1 36 2.1	2 56.3	2 6 38.4	4 27.3	9.859 4612	0.192 9988	0.194 1645
	25	40 41 50.2	1 36 5.4	2 50.6	1 57 32.0	4 39.0	9.859 2965	0.195 3138	0.196 4469
	27	43 54 4.2	1 36 8.7	2 42.8	1 48 3.1	4 49.8	9.859 1319	0.197 5637	0.198 6642
	29	47 6 24.9	1 36 12.1	2 33.0	1 38 13.5	4 59.7	9.858 9677	0.199 7484	0.200 8162
July	1	50 18 52.5	1 36 15.5	−2 21.2	−1 28 5.0	+5 8.7	9.858 8046	0.201 8677	0.202 9028
	3	53 31 26.9	1 36 18.9	−2 7.6	−1 17 39.4	+5 16.7	9.858 6430	0.203 9214	0.204 9236

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fro Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
July 1	50 18 52.5	1 36 15.5	−2 21.2	−1 28 5.0	+5 8.7	9.858 8046	0.201 8677	0.202 90
3	53 31 26.9	1 36 18.9	2 7.6	1 17 39.4	5 16.7	9.858 6430	0.203 9214	0.204 923
5	56 44 8.2	1 36 22.4	1 52.4	1 6 58.8	5 23.7	9.858 4834	0.205 9093	0.206 878
7	59 56 56.6	1 36 25.9	1 35.8	0 56 5.1	5 29.8	9.858 3263	0.207 8312	0.208 767
9	63 9 52.1	1 36 29.5	1 18.0	0 45 0.4	5 34.8	9.858 1724	0.209 6868	0.210 589
11	66 22 54.7	1 36 33.1	−0 59.2	−0 33 46.7	+5 38.7	9.858 0220	0.211 4764	0.212 346
13	69 36 4.5	1 36 36.7	0 39.6	0 22 26.1	5 41.6	9.857 8756	0.213 2005	0.214 038
15	72 49 21.4	1 36 40.3	−0 19.5	−0 11 0.8	5 43.5	9.857 7337	0.214 8596	0.215 664
17	76 2 45.6	1 36 43.9	+0 0.8	+0 0 27.1	5 44.2	9.857 5968	0.216 4542	0.217 227
19	79 16 17.0	1 36 47.5	0 21.1	0 11 55.2	5 43.8	9.857 4653	0.217 9852	0.218 727
21	82 29 55.5	1 36 51.1	+0 41.2	+0 23 21.5	+5 42.3	9.857 3396	0.219 4534	0.220 164
23	85 43 41.1	1 36 54.6	1 0.8	0 34 43.8	5 39.7	9.857 2201	0.220 8599	0.221 540
25	88 57 33.7	1 36 58.0	1 19.6	0 45 59.8	5 36.0	9.857 1073	0.222 2054	0.222 8555
27	92 11 33.2	1 37 1.4	1 37.4	0 57 7.3	5 31.3	9.857 0015	0.223 4905	0.224 1105
29	95 25 39.4	1 37 4.7	1 54.0	1 8 4.2	5 25.5	9.856 9030	0.224 7154	0.225 3052
31	98 39 52.1	1 37 8.0	+2 9.2	+1 18 48.4	+5 18.6	9.856 8122	0.225 8799	0.226 439
Aug. 2	101 54 11.2	1 37 11.1	2 22.7	1 29 17.8	5 10.6	9.856 7293	0.226 9837	0.227 512
4	105 8 36.3	1 37 14.0	2 34.3	1 39 30.3	5 1.6	9.856 6547	0.228 0268	0.228 5256
6	108 23 7.1	1 37 16.8	2 44.0	1 49 23.9	4 51.7	9.856 5886	0.229 0093	0.229 4778
8	111 37 43.4	1 37 19.4	2 51.6	1 58 56.6	4 40.8	9.856 5312	0.229 9311	0.230 3692
10	114 52 24.7	1 37 21.8	+2 57.0	+2 8 6.6	+4 29.0	9.856 4827	0.230 7922	0.231 200
12	118 7 10.7	1 37 24.0	3 0.2	2 16 52.1	4 16.3	9.856 4432	0.231 5932	0.231 9713
14	121 22 0.8	1 37 26.0	3 1.0	2 25 11.4	4 2.8	9.856 4130	0.232 3345	0.232 6829
16	124 36 54.7	1 37 27.7	2 59.5	2 33 2.7	3 48.5	9.856 3921	0.233 0167	0.233 3360
18	127 51 51.7	1 37 29.2	2 55.7	2 40 24.6	3 33.4	9.856 3805	0.233 6409	0.233 9316
20	131 6 51.4	1 37 30.4	+2 49.6	+2 47 15.7	+3 17.6	9.856 3783	0.234 2081	0.234 4706
22	134 21 53.1	1 37 31.3	2 41.4	2 53 34.5	3 1.1	9.856 3855	0.234 7193	0.234 9542
24	137 36 56.3	1 37 31.8	2 31.1	2 59 19.8	2 44.1	9.856 4021	0.235 1754	0.235 3829
26	140 52 0.3	1 37 32.0	2 18.8	3 4 30.5	2 26.6	9.856 4281	0.235 5769	0.235 7572
28	144 7 4.4	1 37 31.9	2 4.8	3 9 5.6	2 8.6	9.856 4633	0.235 9239	0.236 0771
30	147 22 7.9	1 37 31.5	+1 49.1	+3 13 4.2	+1 50.1	9.856 5077	0.236 2167	0.236 3427
Sept. 1	150 37 10.2	1 37 30.7	1 32.1	3 16 25.6	1 31.3	9.856 5610	0.236 4551	0.236 5539
3	153 52 10.6	1 37 29.6	1 13.9	3 19 9.1	1 12.2	9.856 6232	0.236 6392	0.236 7109
5	157 7 8.4	1 37 28.1	0 54.7	3 21 14.2	0 52.9	9.856 6939	0.236 7691	0.236 8137
7	160 22 2.8	1 37 26.2	0 34.8	3 22 40.5	0 33.4	9.856 7731	0.236 8448	0.236 8623
9	163 36 53.2	1 37 24.0	+0 14.5	+3 23 27.8	+0 13.9	9.856 8603	0.236 8663	0.236 8568
11	166 51 38.8	1 37 21.5	−0 5.9	3 23 36.1	−0 5.7	9.856 9554	0.236 8339	0.236 7977
13	170 6 19.1	1 37 18.7	0 26.3	3 23 5.3	0 25.2	9.857 0580	0.236 7482	0.236 6856
15	173 20 53.3	1 37 15.5	0 46.4	3 21 55.5	0 44.6	9.857 1677	0.236 6101	0.236 5217
17	176 35 20.9	1 37 12.0	1 5.8	3 20 7.1	1 3.8	9.857 2843	0.236 4205	0.236 3066
19	179 49 41.2	1 37 8.2	−1 24.4	+3 17 40.4	−1 22.8	9.857 4074	0.236 1804	0.236 0419
21	183 3 53.6	1 37 4.1	1 41.9	3 14 36.1	1 41.5	9.857 5365	0.235 8911	0.235 7281
23	186 17 57.6	1 36 59.8	1 58.1	3 10 54.7	1 59.8	9.857 6712	0.235 5529	0.235 3656
25	189 31 52.8	1 36 55.3	2 12.8	3 6 37.1	2 17.7	9.857 8110	0.235 1664	0.234 9552
27	192 45 38.7	1 36 50.5	2 25.8	3 1 44.2	2 35.1	9.857 9556	0.234 7321	0.234 4970
29	195 59 14.9	1 36 45.6	−2 36.9	+2 56 17.0	−2 52.0	9.858 1045	0.234 2500	0.233 9911
Oct. 1	199 12 41.0	1 36 40.5	−2 46.0	+2 50 16.5	−3 8.4	9.858 2572	0.233 7202	0.233 4373

VENUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	° ′ ″	′ ″	° ′ ″	′ ″			
ct. 1	199 12 41.0	1 36 40.5	−2 46.0	+2 50 16.5	−3 8.4	9.858 2572	0.233 7202	0.233 4373
3	202 25 56.7	1 36 35.2	2 53.1	2 43 44.0	3 24.0	9.858 4132	0.233 1423	0.232 8353
5	205 39 1.9	1 36 29.9	2 57.9	2 36 40.9	3 39.0	9.858 5719	0.232 5164	0.232 1854
7	208 51 56.3	1 36 24.5	3 0.5	2 29 8.5	3 53.2	9.858 7330	0.231 8424	0.231 4874
9	212 4 39.8	1 36 19.0	3 0.9	2 21 8.3	4 6.7	9.858 8958	0.231 1204	0.230 7413
11	215 17 12.4	1 36 13.5	−2 59.0	+2 12 42.0	−4 19.4	9.859 0599	0.230 3502	0.229 9471
13	218 29 33.9	1 36 8.0	2 54.8	2 3 51.2	4 31.3	9.859 2247	0.229 5322	0.229 1055
15	221 41 44.5	1 36 2.6	2 48.4	1 54 37.5	4 42.3	9.859 3898	0.228 6673	0.228 2176
17	224 53 44.3	1 35 57.2	2 40.0	1 45 2.8	4 52.3	9.859 5546	0.227 7565	0.227 2842
19	228 5 33.3	1 35 51.9	2 29.6	1 35 9.0	5 1.4	9.859 7186	0.226 8007	0.226 3060
21	231 17 11.8	1 35 46.7	−2 17.3	+1 24 57.8	−5 9.6	9.859 8812	0.225 8002	0.225 2834
23	234 28 40.0	1 35 41.6	2 3.3	1 14 31.3	5 16.8	9.860 0421	0.224 7557	0.224 2170
25	237 39 58.3	1 35 36.7	1 47.8	1 3 51.4	5 22.9	9.860 2006	0.223 6674	0.223 1070
27	240 51 6.9	1 35 32.0	1 31.0	0 53 0.1	5 28.1	9.860 3563	0.222 5357	0.221 9536
29	244 2 6.3	1 35 27.5	1 13.0	0 41 59.5	5 32.3	9.860 5088	0.221 3605	0.220 7564
31	247 12 56.8	1 35 23.1	−0 54.2	+0 30 51.6	−5 35.4	9.860 6575	0.220 1413	0.219 5152
lov. 2	250 23 38.9	1 35 19.0	0 34.7	0 19 38.4	5 37.5	9.860 8020	0.218 8781	0.218 2298
4	253 34 13.0	1 35 15.2	−0 14.8	+0 8 22.0	5 38.6	9.860 9418	0.217 5702	0.216 8993
6	256 44 39.8	1 35 11.7	+0 5.2	−0 2 55.5	5 38.7	9.861 0766	0.216 2171	0.215 5235
8	259 54 59.7	1 35 8.4	0 25.1	0 14 12.0	5 37.7	9.861 2059	0.214 8184	0.214 1018
10	263 5 13.3	1 35 5.3	+0 44.8	−0 25 25.6	−5 35.7	9.861 3293	0.213 3738	0.212 6344
12	266 15 21.1	1 35 2.5	1 3.9	0 36 34.1	5 32.6	9.861 4465	0.211 8836	0.211 1215
14	269 25 23.6	1 35 0.1	1 22.2	0 47 35.5	5 28.6	9.861 5571	0.210 3482	0.209 5637
16	272 35 21.6	1 34 58.0	1 39.5	0 58 27.9	5 23.6	9.861 6608	0.208 7680	0.207 9613
18	275 45 15.5	1 34 56.1	1 55.6	1 9 9.3	5 17.6	9.861 7573	0.207 1436	0.206 3149
20	278 55 6.0	1 34 54.5	+2 10.3	−1 19 37.7	−5 10.7	9.861 8463	0.205 4752	0.204 6246
22	282 4 53.6	1 34 53.2	2 23.3	1 29 51.4	5 2.8	9.861 9275	0.203 7630	0.202 8905
24	285 14 38.9	1 34 52.2	2 34.6	1 39 48.5	4 54.0	9.862 0006	0.202 0071	0.201 1126
26	288 24 22.4	1 34 51.5	2 44.1	1 49 27.1	4 44.4	9.862 0655	0.200 2070	0.199 2903
28	291 34 4.7	1 34 51.0	2 51.5	1 58 45.6	4 33.9	9.862 1220	0.198 3624	0.197 4233
30	294 43 46.4	1 34 50.8	+2 56.8	−2 7 42.3	−4 22.6	9.862 1699	0.196 4728	0.195 5107
Dec. 2	297 53 28.0	1 34 50.9	3 0.0	2 16 15.6	4 10.5	9.862 2091	0.194 5370	0.193 5517
4	301 3 10.0	1 34 51.2	3 1.0	2 24 23.9	3 57.6	9.862 2394	0.192 5546	0.191 5454
6	304 12 52.8	1 34 51.7	2 59.8	2 32 5.8	3 44.1	9.862 2608	0.190 5241	0.189 4905
8	307 22 36.9	1 34 52.5	2 56.4	2 39 20.0	3 29.9	9.862 2732	0.188 4445	0.187 3861
10	310 32 22.8	1 34 53.5	+2 50.9	−2 46 5.1	−3 15.0	9.862 2765	0.186 3152	0.185 2318
12	313 42 10.8	1 34 54.7	2 43.3	2 52 19.8	2 59.6	9.862 2708	0.184 1360	0.183 0276
14	316 52 1.3	1 34 56.0	2 33.6	2 58 3.1	2 43.6	9.862 2561	0.181 9067	0.180 7732
16	320 1 54.7	1 34 57.5	2 22.1	3 3 13.9	2 27.1	9.862 2325	0.179 6273	0.178 4689
18	323 11 51.3	1 34 59.2	2 8.9	3 7 51.2	2 10.2	9.862 1999	0.177 2980	0.176 1145
20	326 21 51.4	1 35 1.0	+1 54.1	−3 11 54.3	−1 52.8	9.862 1584	0.174 9184	0.173 7096
22	329 31 55.3	1 35 3.0	1 37.9	3 15 22.3	1 35.1	9.862 1083	0.172 4881	0.171 2537
24	332 42 3.3	1 35 5.1	1 20.6	3 18 14.6	1 17.1	9.862 0497	0.170 0065	0.168 7463
26	335 52 15.6	1 35 7.3	1 2.2	3 20 30.7	0 58.9	9.861 9827	0.167 4731	0.166 1867
28	339 2 32.4	1 35 9.6	0 43.0	3 22 10.0	0 40.4	9.861 9075	0.164 8869	0.163 5735
30	342 12 53.9	1 35 11.9	+0 23.3	−3 23 12.3	−0 21.8	9.861 8244	0.162 2464	0.160 9055
32	345 23 20.2	1 35 14.4	+0 3.4	−3 23 37.3	−0 3.2	9.861 7336	0.159 5504	0.158 1810

MARS.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance Earth— At Date.	At Inter diate Da
		° ′ ″	′ ″	″	° ′ ″	″			
Jan.	0	275 47 9.4	35 1.44	+53.7	−1 21 3.2	−46.37	0.158 5328	0.384 3051	0.384 05
	2	276 57 18.8	35 7.98	53.5	1 22 35.1	45.49	0.157 8631	0.383 8023	0.383 545
	4	278 7 41.3	35 14.47	53.2	1 24 5.1	44.57	0.157 2011	0.383 2854	0.383 021
	6	279 18 16.7	35 20.90	52.8	1 25 33.3	43.63	0.156 5471	0.382 7547	0.382 48
	8	280 29 4.8	35 27.26	52.4	1 26 59.7	42.67	0.155 9014	0.382 2100	0.381 93
	10	281 40 5.6	35 33.56	+51.8	−1 28 24.0	−41.67	0.155 2643	0.381 6516	0.381 367
	12	282 51 19.0	35 39.78	51.2	1 29 46.3	40.64	0.154 6361	0.381 0794	0.380 7
	14	284 2 44.7	35 45.93	50.4	1 31 6.6	39.58	0.154 0174	0.380 4938	0.380 19
	16	285 14 22.6	35 52.00	49.6	1 32 24.7	38.50	0.153 4082	0.379 8944	0.379 589
	18	286 26 12.6	35 57.99	48.7	1 33 40.5	37.39	0.152 8091	0.379 2822	0.378 971
	20	287 38 14.5	36 3.89	+47.7	−1 34 54.2	−36.25	0.152 2203	0.378 6578	0.378 341
	22	288 50 28.1	36 9.70	46.6	1 36 5.5	35.08	0.151 6423	0.378 0220	0.377 70
	24	290 2 53.3	36 15.41	45.5	1 37 14.5	33.88	0.151 0752	0.377 3755	0.377 04
	26	291 15 29.7	36 21.03	44.2	1 38 21.0	32.66	0.150 5195	0.376 7194	0.376 387
	28	292 28 17.3	36 26.54	42.9	1 39 25.1	31.41	0.149 9754	0.376 0541	0.375 718
	30	293 41 15.8	36 31.95	+41.5	−1 40 26.7	−30.13	0.149 4433	0.375 3804	0.375 04
Feb.	1	294 54 25.1	36 37.25	40.0	1 41 25.7	28.83	0.148 9235	0.374 6985	0.374 35
	3	296 7 44.8	36 42.42	38.4	1 42 22.0	27.51	0.148 4163	0.374 0095	0.373 662
	5	297 21 14.7	36 47.48	36.7	1 43 15.7	26.16	0.147 9221	0.373 3131	0.372 962
	7	298 34 54.6	36 52.41	35.0	1 44 6.6	24.79	0.147 4410	0.372 6090	0.372 2543
	9	299 48 44.2	36 57.21	+33.2	−1 44 54.8	−23.40	0.146 9736	0.371 8976	0.371 53
	11	301 2 43.3	37 1.87	31.4	1 45 40.2	21.99	0.146 5199	0.371 1780	0.370 815
	13	302 16 51.6	37 6.41	29.5	1 46 22.8	20.55	0.146 0803	0.370 4505	0.370 0839
	15	303 31 8.9	37 10.80	27.5	1 47 2.4	19.09	0.145 6551	0.369 7155	0.369 3455
	17	304 45 34.7	37 15.05	25.5	1 47 39.2	17.62	0.145 2445	0.368 9739	0.368 6007
	19	306 0 9.0	37 19.15	+23.4	−1 48 12.9	−16.13	0.144 8488	0.368 2259	0.367 8496
	21	307 14 51.2	37 23.10	21.3	1 48 43.7	14.62	0.144 4683	0.367 4719	0.367 0929
	23	308 29 41.3	37 26.89	19.1	1 49 11.4	13.10	0.144 1032	0.366 7126	0.366 3312
	25	309 44 38.7	37 30.53	16.9	1 49 36.0	11.56	0.143 7538	0.365 9488	0.365 5655
	27	310 59 43.3	37 34.01	14.7	1 49 57.6	10.01	0.143 4202	0.365 1813	0.364 7961
Mar.	1	312 14 54.6	37 37.32	+12.4	−1 50 16.1	− 8.44	0.143 1028	0.364 4099	0.364 0229
	3	313 30 12.5	37 40.46	10.1	1 50 31.4	6.87	0.142 8017	0.363 6351	0.363 2465
	5	314 45 36.4	37 43.44	7.8	1 50 43.5	5.28	0.142 5171	0.362 8571	0.362 4669
	7	316 1 6.1	37 46.24	5.5	1 50 52.5	3.68	0.142 2493	0.362 0758	0.361 6837
	9	317 16 41.2	37 48.87	3.1	1 50 58.2	2.08	0.141 9982	0.361 2906	0.360 8963
	11	318 32 21.5	37 51.32	+ 0.7	−1 51 0.7	− 0.47	0.141 7644	0.360 5008	0.360 1040
	13	319 48 6.4	37 53.59	− 1.7	1 51 0.1	+ 1.15	0.141 5476	0.359 7060	0.359 3060
	15	321 3 55.7	37 55.68	4.1	1 50 56.1	2.77	0.141 3482	0.358 9067	0.358 5054
	17	322 19 49.0	37 57.58	6.4	1 50 49.0	4.40	0.141 1664	0.358 1029	0.357 6993
	19	323 35 45.9	37 59.30	8.8	1 50 38.5	6.02	0.141 0022	0.357 2947	0.356 8892
	21	324 51 46.1	38 0.83	−11.1	−1 50 24.9	+ 7.65	0.140 8558	0.356 4827	0.356 0752
	23	326 7 49.1	38 2.17	13.4	1 50 7.9	9.27	0.140 7273	0.355 6668	0.355 2576
	25	327 23 54.6	38 3.32	15.7	1 49 47.8	10.88	0.140 6166	0.354 8477	0.354 4371
	27	328 40 2.2	38 4.28	18.0	1 49 24.4	12.49	0.140 5241	0.354 0257	0.353 6133
	29	329 56 11.5	38 5.04	20.2	1 48 57.8	14.10	0.140 4495	0.353 2007	0.352 7875
	31	331 12 22.2	38 5.62	−22.4	−1 48 28.0	+15.71	0.140 3931	0.352 3736	0.351 9589
Apr.	2	332 28 33.9	38 6.00	−24.5	−1 47 54.9	+17.31	0.140 3549	0.351 5435	0.351 1274

MARS.

GREENWICH MEAN NOON.

ate.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth— At Date.	Logarithm of Distance from Earth— At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
2	332 28 33.9	38 6.00	−24.5	−1 47 54.9	+17.31	0.140 3549	0.351 5435	0.351 1274
4	333 44 46.1	38 6.19	26.6	1 47 18.7	18.89	0.140 3348	0.350 7106	0.350 2926
6	335 0 58.5	38 6.18	28.7	1 46 39.3	20.47	0.140 3331	0.349 8734	0.349 4531
8	336 17 10.7	38 5.98	30.7	1 45 56.8	22.04	0.140 3495	0.349 0316	0.348 6088
10	337 33 22.3	38 5.59	32.6	1 45 11.2	23.59	0.140 3842	0.348 1845	0.347 7588
12	338 49 32.8	38 5.00	−34.4	−1 44 22.5	+25.13	0.140 4370	0.347 3316	0.346 9031
14	340 5 42.1	38 4.22	36.2	1 43 30.7	26.65	0.140 5080	0.346 4732	0.346 0416
16	341 21 49.5	38 3.25	37.9	1 42 35.9	28.15	0.140 5971	0.345 6084	0.345 1734
18	342 37 54.9	38 2.08	39.6	1 41 38.1	29.64	0.140 7042	0.344 7369	0.344 2991
20	343 53 57.7	38 0.73	41.2	1 40 37.3	31.11	0.140 8293	0.343 8598	0.343 4189
22	345 9 57.7	37 59.18	−42.7	−1 39 33.7	+32.55	0.140 9722	0.342 9766	0.342 5328
24	346 25 54.3	37 57.45	44.1	1 38 27.1	33.97	0.141 1329	0.342 0875	0.341 6408
26	347 41 47.3	37 55.53	45.4	1 37 17.8	35.38	0.141 3113	0.341 1925	0.340 7428
28	348 57 36.3	37 53.43	46.6	1 36 5.6	36.75	0.141 5072	0.340 2915	0.339 8386
30	350 13 20.9	37 51.15	47.8	1 34 50.8	38.11	0.141 7205	0.339 3840	0.338 9278
y 2	351 29 0.8	37 48.69	−48.8	−1 33 33.2	+39.44	0.141 9511	0.338 4699	0.338 0096
4	352 44 35.6	37 46.06	49.8	1 32 13.1	40.74	0.142 1988	0.337 5473	0.337 0829
6	354 0 4.9	37 43.25	50.6	1 30 50.3	42.01	0.142 4634	0.336 6162	0.336 1471
8	355 15 28.5	37 40.26	51.3	1 29 25.0	43.26	0.142 7448	0.335 6754	0.335 2009
10	356 30 45.9	37 37.13	51.9	1 27 57.3	44.47	0.143 0426	0.334 7237	0.334 2435
12	357 45 56.9	37 33.81	−52.5	−1 26 27.2	+45.65	0.143 3570	0.333 7604	0.333 2743
14	359 1 1.1	37 30.34	52.9	1 24 54.7	46.80	0.143 6874	0.332 7853	0.332 2932
16	0 15 58.1	37 26.71	53.3	1 23 20.0	47.93	0.144 0338	0.331 7980	0.331 2997
18	1 30 47.8	37 22.91	53.5	1 21 43.0	49.02	0.144 3959	0.330 7982	0.330 2935
20	2 45 29.7	37 18.96	53.7	1 20 3.9	50.08	0.144 7735	0.329 7856	0.329 2745
22	4 0 3.5	37 14.86	−53.7	−1 18 22.7	+51.11	0.145 1662	0.328 7602	0.328 2427
24	5 14 29.0	37 10.61	53.7	1 16 39.5	52.10	0.145 5739	0.327 7219	0.327 1977
26	6 28 45.9	37 6.22	53.5	1 14 54.3	53.06	0.145 9963	0.326 6703	0.326 1394
28	7 42 53.8	37 1.70	53.3	1 13 7.3	53.98	0.146 4332	0.325 6050	0.325 0672
30	8 56 52.6	36 57.04	52.9	1 11 18.4	54.87	0.146 8842	0.324 5257	0.323 9800
ne 1	10 10 41.9	36 52.25	−52.5	−1 9 27.8	+55.72	0.147 3491	0.323 4301	0.322 8762
3	11 24 21.5	36 47.33	51.9	1 7 35.5	56.54	0.147 8276	0.322 3180	0.321 7551
5	12 37 51.2	36 42.29	51.3	1 5 41.6	57.32	0.148 3193	0.321 1876	0.320 6154
7	13 51 10.6	36 37.13	50.6	1 3 46.2	58.07	0.148 8241	0.320 0383	0.319 4560
9	15 4 19.6	36 31.85	49.8	1 1 49.3	58.78	0.149 3415	0.318 8685	0.318 2758
11	16 17 17.9	36 26.46	−48.9	−0 59 51.0	+59.46	0.149 8713	0.317 6778	0.317 0744
13	17 30 5.4	36 20.97	47.9	0 57 51.4	60.10	0.150 4131	0.316 4655	0.315 8511
15	18 42 41.7	36 15.37	46.8	0 55 50.6	60.71	0.150 9666	0.315 2311	0.314 6055
17	19 55 6.8	36 9.68	45.6	0 53 48.6	61.29	0.151 5316	0.313 9741	0.313 3369
19	21 7 20.3	36 3.89	44.4	0 51 45.4	61.83	0.152 1076	0.312 6940	0.312 0452
21	22 19 22.3	35 58.01	−43.1	−0 49 41.3	+62.33	0.152 6944	0.311 3907	0.310 7304
23	23 31 12.3	35 52.05	41.7	0 47 36.1	62.80	0.153 2915	0.310 0641	0.309 3919
25	24 42 50.4	35 46.01	40.2	0 45 30.1	63.23	0.153 8989	0.308 7133	0.308 0286
27	25 54 16.3	35 39.89	38.7	0 43 23.3	63.62	0.154 5159	0.307 3375	0.306 6400
29	27 5 29.9	35 33.69	37.1	0 41 15.6	63.98	0.155 1424	0.305 9358	0.305 2247
uly 1	28 16 31.0	35 27.42	−35.5	−0 39 7.4	+64.31	0.155 7777	0.304 5065	0.303 7811
3	29 27 19.5	35 21.08	−33.8	−0 36 58.4	+64.60	0.156 4221	0.303 0484	0.302 3079

MARS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance Earth— At Date.	At Inter diate D
	° ′ ″	′ ″	″	° ′ ″	″			
July 1	28 16 31.0	35 27.42	−35.5	−0 39 7.4	+64.31	0.155 7777	0.304 5065	0.303 7
3	29 27 19.5	35 21.08	33.8	0 36 58.4	64.60	0.156 4221	0.303 0484	0.302 3
5	30 37 55.3	35 14.68	32.0	0 34 48.9	64.86	0.157 0745	0.301 5593	0.300 8
7	31 48 18.2	35 8.23	30.2	0 32 39.0	65.08	0.157 7352	0.300 0383	0.299 2
9	32 58 28.2	35 1.73	28.4	0 30 28.7	65.28	0.158 4035	0.298 4854	0.297 6
11	34 8 25.1	34 55.18	−26.5	−0 28 17.9	+65.44	0.159 0792	0.296 8985	0.296 0
13	35 18 8.9	34 48.58	24.6	0 26 6.9	65.57	0.159 7619	0.295 2776	0.294 4
15	36 27 39.4	34 41.94	22.6	0 23 55.7	65.67	0.160 4512	0.293 6218	0.292 7
17	37 36 56.6	34 35.26	20.6	0 21 44.2	65.74	0.161 1469	0.291 9301	0.291 0
19	38 46 0.4	34 28.55	18.6	0 19 32.7	65.78	0.161 8485	0.290 2026	0.289 3
21	39 54 50.8	34 21.81	−16.6	−0 17 21.2	+65.79	0.162 5558	0.288 4388	0.287 5
23	41 3 27.7	34 15.04	14.6	0 15 9.6	65.76	0.163 2685	0.286 6380	0.285 7
25	42 11 51.0	34 8.25	12.5	0 12 58.1	65.71	0.163 9861	0.284 7995	0.283 8
27	43 20 0.7	34 1.44	10.4	0 10 46.8	65.63	0.164 7084	0.282 9218	0.281 9
29	44 27 56.7	33 54.62	8.3	0 8 35.6	65.53	0.165 4351	0.281 0030	0.280 0
31	45 35 39.1	33 47.78	− 6.2	−0 6 24.7	+65.40	0.166 1657	0.279 0432	0.278 0
Aug. 2	46 43 7.8	33 40.93	4.1	0 4 14.1	65.24	0.166 9001	0.277 0391	0.276 0
4	47 50 22.8	33 34.07	− 2.0	−0 2 3.8	65.05	0.167 6377	0.274 9894	0.273 94
6	48 57 24.0	33 27.20	+ 0.1	+0 0 6.1	64.84	0.168 3786	0.272 8931	0.271 8
8	50 4 11.6	33 20.34	2.2	0 2 15.6	64.60	0.169 1219	0.270 7492	0.269 6
10	51 10 45.4	33 13.48	+ 4.3	+0 4 24.5	+64.34	0.169 8677	0.268 5565	0.267 44
12	52 17 5.5	33 6.63	6.3	0 6 32.9	64.06	0.170 6158	0.266 3140	0.265 17
14	53 23 11.9	32 59.80	8.4	0 8 40.8	63.76	0.171 3655	0.264 0212	0.262 85
16	54 29 4.7	32 52.96	10.4	0 10 47.9	63.43	0.172 1169	0.261 6776	0.260 4
18	55 34 43.8	32 46.14	12.4	0 12 54.5	63.09	0.172 8694	0.259 2828	0.258 06
20	56 40 9.3	32 39.34	+14.4	+0 15 0.2	+62.72	0.173 6229	0.256 8358	0.255 59
22	57 45 21.1	32 32.56	16.4	0 17 5.3	62.33	0.174 3771	0.254 3357	0.253 06
24	58 50 19.5	32 25.80	18.3	0 19 9.5	61.92	0.175 1316	0.251 7816	0.250 4
26	59 55 4.4	32 19.07	20.2	0 21 13.0	61.49	0.175 8862	0.249 1720	0.247 84
28	60 59 35.8	32 12.36	22.0	0 23 15.5	61.04	0.176 6406	0.246 5043	0.245 14
30	62 3 53.8	32 5.67	+23.8	+0 25 17.1	+60.57	0.177 3945	0.243 7771	0.242 39
Sept. 1	63 7 58.5	31 59.02	25.6	0 27 17.7	60.09	0.178 1477	0.240 9886	0.239 57
3	64 11 49.9	31 52.39	27.4	0 29 17.4	59.59	0.178 8999	0.238 1377	0.236 68
5	65 15 28.1	31 45.81	29.1	0 31 16.1	59.07	0.179 6509	0.235 2221	0.233 73
7	66 18 53.2	31 39.26	30.7	0 33 13.7	58.54	0.180 4004	0.232 2412	0.230 72
9	67 22 5.2	31 32.76	+32.3	+0 35 10.2	+57.99	0.181 1481	0.229 1933	0.227 644
11	68 25 4.3	31 26.29	33.8	0 37 5.6	57.43	0.181 8938	0.226 0779	0.224 494
13	69 27 50.4	31 19.86	35.3	0 38 59.9	56.85	0.182 6373	0.222 8946	0.221 27
15	70 30 23.8	31 13.49	36.8	0 40 53.0	56.26	0.183 3783	0.219 6426	0.217 90
17	71 32 44.5	31 7.16	38.2	0 42 44.9	55.66	0.184 1167	0.216 3211	0.214 634
19	72 34 52.5	31 0.87	+39.5	+0 44 35.5	+55.05	0.184 8521	0.212 9292	0.211 206
21	73 36 48.0	30 54.64	40.8	0 46 25.1	54.42	0.185 5844	0.209 4657	0.207 706
23	74 38 31.1	30 48.45	42.0	0 48 13.3	53.78	0.186 3133	0.205 9287	0.204 1320
25	75 40 1.8	30 42.31	43.2	0 50 0.2	53.13	0.187 0387	0.202 3161	0.200 4810
27	76 41 20.4	30 36.23	44.3	0 51 45.8	52.47	0.187 7603	0.198 6261	0.196 751
29	77 42 26.8	30 30.20	+45.3	+0 53 30.1	+51.80	0.188 4779	0.194 8568	0.192 9418
Oct. 1	78 43 21.2	30 24.22	+46.3	+0 55 13.0	+51.11	0.189 1913	0.191 0062	0.189 0499

MARS.

GREENWICH MEAN NOON.

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	° ′ ″	′ ″	″	° ′ ″	″			
t. 1	78 43 21.2	30 24.22	+46.3	+0 55 13.0	+51.11	0.189 1913	0.191 0062	0.189 0499
3	79 44 3.7	30 18.30	47.3	0 56 54.5	50.42	0.189 9004	0.187 0726	0.185 0742
5	80 44 34.4	30 12.44	48.2	0 58 34.6	49.72	0.190 6049	0.183 0546	0.181 0135
7	81 44 53.5	30 6.64	49.0	1 0 13.4	49.01	0.191 3047	0.178 9508	0.176 8665
9	82 45 1.0	30 0.91	49.7	1 1 50.7	48.30	0.191 9995	0.174 7604	0.172 6325
11	83 44 57.2	29 55.23	+50.4	+1 3 26.6	+47.58	0.192 6892	0.170 4828	0.168 3111
13	84 44 42.0	29 49.61	51.0	1 5 1.0	46.85	0.193 3736	0.166 1174	0.163 9016
15	85 44 15.7	29 44.06	51.6	1 6 34.0	46.11	0.194 0526	0.161 6637	0.159 4037
17	86 43 38.3	29 38.57	52.1	1 8 5.5	45.37	0.194 7260	0.157 1214	0.154 8164
19	87 42 50.0	29 33.14	52.5	1 9 35.5	44.62	0.195 3936	0.152 4885	0.150 1378
21	88 41 50.9	29 27.78	+52.9	+1 11 3.9	+43.86	0.196 0553	0.147 7638	0.145 3664
23	89 40 41.1	29 22.48	53.2	1 12 30.9	43.10	0.196 7108	0.142 9454	0.140 5004
25	90 39 20.9	29 17.26	53.4	1 13 56.3	42.33	0.197 3601	0.138 0313	0.135 5378
27	91 37 50.2	29 12.09	53.6	1 15 20.2	41.56	0.198 0030	0.133 0199	0.130 4772
29	92 36 9.2	29 7.00	53.7	1 16 42.6	40.78	0.198 6394	0.127 9097	0.125 3170
31	93 34 18.2	29 1.97	+53.8	+1 18 3.3	+40.00	0.199 2692	0.122 6990	0.120 0555
v. 2	94 32 17.1	28 57.01	53.8	1 19 22.6	39.21	0.199 8921	0.117 3864	0.114 6916
4	95 30 6.2	28 52.12	53.7	1 20 40.2	38.42	0.200 5081	0.111 9712	0.109 2251
6	96 27 45.6	28 47.29	53.6	1 21 56.3	37.63	0.201 1170	0.106 4536	0.103 6563
8	97 25 15.5	28 42.54	53.4	1 23 10.7	36.84	0.201 7188	0.100 8333	0.097 9849
10	98 22 35.8	28 37.86	+53.1	+1 24 23.6	+36.04	0.202 3132	0.095 1111	0.092 2120
12	99 19 47.0	28 33.26	52.8	1 25 34.9	35.24	0.202 9003	0.089 2878	0.086 3384
14	100 16 48.9	28 28.72	52.4	1 26 44.6	34.44	0.203 4797	0.083 3639	0.080 3646
16	101 13 41.9	28 24.26	52.0	1 27 52.6	33.63	0.204 0516	0.077 3402	0.074 2906
18	102 10 26.0	28 19.87	51.5	1 28 59.1	32.82	0.204 6156	0.071 2158	0.068 1158
20	103 7 1.4	28 15.55	+51.0	+1 30 3.9	+32.01	0.205 1718	0.064 9904	0.061 8401
22	104 3 28.2	28 11.30	50.4	1 31 7.1	31.20	0.205 7200	0.058 6650	0.055 4648
24	104 59 46.7	28 7.13	49.8	1 32 8.7	30.38	0.206 2602	0.052 2398	0.048 9899
26	105 55 56.8	28 3.03	49.1	1 33 8.7	29.57	0.206 7921	0.045 7154	0.042 4164
28	106 51 58.9	27 59.00	48.4	1 34 7.0	28.75	0.207 3159	0.039 0930	0.035 7455
30	107 47 52.9	27 55.05	+47.6	+1 35 3.7	+27.94	0.207 8312	0.032 3743	0.028 9802
ec. 2	108 43 39.1	27 51.17	46.7	1 35 58.7	27.12	0.208 3382	0.025 5637	0.022 1245
4	109 39 17.6	27 47.36	45.8	1 36 52.1	26.30	0.208 8366	0.018 6637	0.015 1819
6	110 34 48.6	27 43.63	44.9	1 37 43.9	25.48	0.209 3265	0.011 6800	0.008 1583
8	111 30 12.2	27 39.97	43.9	1 38 34.1	24.66	0.209 8076	0.004 6185	0.001 0613
10	112 25 28.5	27 36.39	+42.9	+1 39 22.6	+23.84	0.210 2800	9.997 4873	9.993 8973
12	113 20 37.8	27 32.88	41.9	1 40 9.4	23.02	0.210 7436	9.990 2925	9.986 6741
14	114 15 40.1	27 29.45	40.8	1 40 54.7	22.20	0.211 1982	9.983 0428	9.979 3995
16	115 10 35.6	27 26.09	39.7	1 41 38.2	21.38	0.211 6438	9.975 7452	9.972 0815
18	116 5 24.5	27 22.81	38.5	1 42 20.2	20.56	0.212 0804	9.968 4092	9.964 7297
20	117 0 6.9	27 19.59	+37.3	+1 43 0.5	+19.74	0.212 5078	9.961 0445	9.957 3547
22	117 54 42.9	27 16.46	36.0	1 43 39.2	18.92	0.212 9260	9.953 6619	9.949 9680
24	118 49 12.8	27 13.41	34.7	1 44 16.2	18.10	0.213 3350	9.946 2746	9.942 5831
26	119 43 36.6	27 10.41	33.4	1 44 51.6	17.29	0.213 7348	9.938 8958	9.935 2150
28	120 37 54.5	27 7.49	32.0	1 45 25.3	16.47	0.214 1251	9.931 5426	9.927 8809
30	121 32 6.6	27 4.66	+30.6	+1 45 57.5	+15.65	0.214 5060	9.924 2326	9.920 6005
32	122 26 13.2	27 1.91	+29.2	+1 46 28.0	+14.83	0.214 8774	9.916 9874	9.913 3960

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		° ′ ″	′ ″	″	° ′ ″	″			
Jan.	0	330 0 6.5	5 21.81	+26.4	−1 0 32.8	−4.68	0.700 2102	0.754 6854	0.756 28
	4	330 21 34.0	5 21.94	26.3	1 0 51.4	4.65	0.700 1248	0.757 8388	0.759 33
	8	330 43 2.1	5 22.07	26.3	1 1 9.9	4.61	0.700 0400	0.760 7687	0.762 14
	12	331 4 30.6	5 22.19	26.2	1 1 28.3	4.58	0.699 9558	0.763 4710	0.764 73
	16	331 25 59.6	5 22.32	26.1	1 1 46.5	4.54	0.699 8721	0.765 9408	0.767 08
	20	331 47 29.2	5 22.44	+26.0	−1 2 4.6	−4.51	0.699 7890	0.768 1743	0.769 20
	24	332 8 59.2	5 22.56	26.0	1 2 22.6	4.47	0.699 7064	0.770 1697	0.771 07
	28	332 30 29.7	5 22.69	25.9	1 2 40.4	4.44	0.699 6244	0.771 9264	0.772 71
Feb.	1	332 52 0.7	5 22.81	25.8	1 2 58.1	4.40	0.699 5429	0.773 4445	0.774 11
	5	333 13 32.1	5 22.93	25.7	1 3 15.7	4.37	0.699 4621	0.774 7237	0.775 27
	9	333 35 4.1	5 23.05	+25.6	−1 3 33.1	−4.33	0.699 3819	0.775 7627	0.776 19
	13	333 56 36.5	5 23.17	25.5	1 3 50.3	4.30	0.699 3022	0.776 5595	0.776 86
	17	334 18 9.4	5 23.29	25.4	1 4 7.4	4.26	0.699 2232	0.777 1125	0.777 29
	21	334 39 42.8	5 23.41	25.2	1 4 24.4	4.22	0.699 1447	0.777 4225	0.777 48
	25	335 1 16.7	5 23.52	25.1	1 4 41.2	4.19	0.699 0669	0.777 4911	0.777 43
Mar.	1	335 22 51.0	5 23.64	+25.0	−1 4 57.9	−4.15	0.698 9897	0.777 3199	0.777 14
	5	335 44 25.8	5 23.75	24.9	1 5 14.4	4.12	0.698 9131	0.776 9108	0.776 61
	9	336 6 1.0	5 23.87	24.7	1 5 30.8	4.08	0.698 8371	0.776 2633	0.775 85
	13	336 27 36.7	5 23.98	24.6	1 5 47.1	4.04	0.698 7618	0.775 3778	0.774 84
	17	336 49 12.9	5 24.09	24.5	1 6 3.2	4.00	0.698 6871	0.774 2542	0.773 60
	21	337 10 49.5	5 24.21	+24.3	−1 6 19.1	−3.96	0.698 6130	0.772 8945	0.772 12
	25	337 32 26.5	5 24.32	24.2	1 6 34.9	3.92	0.698 5396	0.771 3018	0.770 41
	29	337 54 4.0	5 24.43	24.0	1 6 50.5	3.89	0.698 4668	0.769 4791	0.768 48
Apr.	2	338 15 42.0	5 24.54	23.9	1 7 6.0	3.85	0.698 3946	0.767 4296	0.766 3
	6	338 37 20.3	5 24.64	23.7	1 7 21.3	3.81	0.698 3230	0.765 1547	0.763 933
	10	338 58 59.1	5 24.75	+23.6	−1 7 36.5	−3.77	0.698 2521	0.762 6556	0.761 3226
	14	339 20 38.3	5 24.86	23.4	1 7 51.5	3.73	0.698 1819	0.759 9344	0.758 4915
	18	339 42 18.0	5 24.96	23.2	1 8 6.3	3.69	0.698 1123	0.756 9945	0.755 4441
	22	340 3 58.0	5 25.07	23.0	1 8 21.0	3.65	0.698 0433	0.753 8409	0.752 1857
	26	340 25 38.5	5 25.17	22.9	1 8 35.5	3.61	0.697 9750	0.750 4791	0.748 721
	30	340 47 19.4	5 25.27	+22.7	−1 8 49.9	−3.57	0.697 9074	0.746 9141	0.745 05
May	4	341 9 0.7	5 25.37	22.5	1 9 4.1	3.53	0.697 8404	0.743 1498	0.741 194
	8	341 30 42.4	5 25.47	22.3	1 9 18.2	3.49	0.697 7741	0.739 1901	0.737 1384
	12	341 52 24.5	5 25.57	22.1	1 9 32.1	3.45	0.697 7085	0.735 0398	0.732 8954
	16	342 14 7.0	5 25.67	21.9	1 9 45.8	3.41	0.697 6436	0.730 7064	0.728 4736
	20	342 35 49.9	5 25.77	+21.7	−1 9 59.4	−3.37	0.697 5793	0.726 1982	0.723 8817
	24	342 57 33.1	5 25.86	21.5	1 10 12.8	3.33	0.697 5157	0.721 5252	0.719 1299
	28	343 19 16.8	5 25.96	21.3	1 10 26.1	3.29	0.697 4527	0.716 6970	0.714 2277
June	1	343 41 0.8	5 26.05	21.1	1 10 39.2	3.25	0.697 3905	0.711 7230	0.709 1840
	5	344 2 45.2	5 26.15	20.9	1 10 52.1	3.21	0.697 3290	0.706 6121	0.704 0089
	9	344 24 30.0	5 26.24	+20.7	−1 11 4.8	−3.17	0.697 2681	0.701 3760	0.698 7153
	13	344 46 15.1	5 26.33	20.5	1 11 17.4	3.12	0.697 2080	0.696 0289	0.693 3190
	17	345 8 0.6	5 26.42	20.3	1 11 29.8	3.08	0.697 1485	0.690 5878	0.687 8375
	21	345 29 46.5	5 26.51	20.0	1 11 42.0	3.04	0.697 0897	0.685 0706	0.682 2895
	25	345 51 32.7	5 26.60	19.8	1 11 54.1	3.00	0.697 0317	0.679 4966	0.676 6940
	29	346 13 19.3	5 26.68	+19.6	−1 12 6.0	−2.95	0.696 9743	0.673 8841	0.671 0695
July	3	346 35 6.2	5 26.77	+19.3	−1 12 17.8	−2.91	0.696 9176	0.668 2530	0.665 4375

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							At Date.	At Intermediate Date.
	° ′ ″	′ ″	″	° ′ ″	″			
ly 3	346 35 6.2	5 26.77	+19.3	−1 12 17.8	−2.91	0.696 9176	0.668 2530	0.665 4375
7	346 56 53.5	5 26.86	19.1	1 12 29.3	2.87	0.696 8616	0.662 6263	0.659 8228
11	347 18 41.1	5 26.94	18.9	1 12 40.7	2.83	0.696 8064	0.657 0306	0.654 2534
15	347 40 29.0	5 27.02	18.6	1 12 51.9	2.78	0.696 7519	0.651 4950	0.648 7594
19	348 2 17.2	5 27.10	18.4	1 13 3.0	2.74	0.696 6981	0.646 0506	0.643 3725
23	348 24 5.8	5 27.18	+18.1	−1 13 13.9	−2.70	0.696 6450	0.640 7291	0.638 1241
27	348 45 54.7	5 27.26	17.9	1 13 24.6	2.65	0.696 5926	0.635 5614	0.633 0451
31	349 7 43.9	5 27.34	17.6	1 13 35.1	2.61	0.696 5410	0.630 5795	0.628 1689
ug. 4	349 29 33.5	5 27.42	17.4	1 13 45.4	2.56	0.696 4901	0.625 8180	0.623 5314
8	349 51 23.3	5 27.50	17.1	1 13 55.6	2.52	0.696 4399	0.621 3139	0.619 1704
12	350 13 13.4	5 27.57	+16.8	−1 14 5.6	−2.48	0.696 3905	0.617 1056	0.615 1242
16	350 35 3.8	5 27.64	16.6	1 14 15.4	2.43	0.696 3418	0.613 2306	0.611 4289
20	350 56 54.6	5 27.72	16.3	1 14 25.1	2.39	0.696 2938	0.609 7232	0.608 1174
24	351 18 45.6	5 27.79	16.0	1 14 34.5	2.34	0.696 2466	0.606 6151	0.605 2196
28	351 40 36.8	5 27.86	15.7	1 14 43.8	2.30	0.696 2001	0.603 9345	0.602 7634
ept. 1	352 2 28.4	5 27.93	+15.5	−1 14 52.9	−2.25	0.696 1544	0.601 7095	0.600 7760
5	352 24 20.3	5 28.00	15.2	1 15 1.8	2.21	0.696 1094	0.599 9657	0.599 2813
9	352 46 12.4	5 28.06	14.9	1 15 10.6	2.16	0.696 0651	0.598 7251	0.598 2988
13	353 8 4.8	5 28.13	14.6	1 15 19.2	2.12	0.696 0216	0.598 0038	0.597 8410
17	353 29 57.5	5 28.20	14.3	1 15 27.6	2.07	0.695 9789	0.597 8108	0.597 9128
21	353 51 50.4	5 28.26	+14.0	−1 15 35.8	−2.03	0.695 9369	0.598 1468	0.598 5121
25	354 13 43.6	5 28.32	13.7	1 15 43.8	1.98	0.695 8957	0.599 0080	0.599 6334
29	354 35 37.0	5 28.39	13.4	1 15 51.6	1.94	0.695 8552	0.600 3869	0.601 2670
ct. 3	354 57 30.6	5 28.45	13.1	1 15 59.3	1.89	0.695 8154	0.602 2718	0.603 3991
7	355 19 24.5	5 28.50	12.8	1 16 6.7	1.84	0.695 7765	0.604 6462	0.606 0102
11	355 41 18.7	5 28.56	+12.5	−1 16 14.0	−1.80	0.695 7383	0.607 4877	0.609 0746
15	356 3 13.0	5 28.62	12.2	1 16 21.1	1.75	0.695 7009	0.610 7669	0.612 5602
19	356 25 7.6	5 28.68	11.9	1 16 28.0	1.71	0.695 6643	0.614 4502	0.616 4325
23	356 47 2.4	5 28.73	11.6	1 16 34.8	1.66	0.695 6284	0.618 5026	0.620 6562
27	357 8 57.5	5 28.78	11.3	1 16 41.3	1.61	0.695 5933	0.622 8890	0.625 1967
31	357 30 52.7	5 28.84	+11.0	−1 16 47.7	−1.57	0.695 5590	0.627 5747	0.630 0182
Nov. 4	357 52 48.2	5 28.89	10.7	1 16 53.8	1.52	0.695 5255	0.632 5227	0.635 0837
8	358 14 43.8	5 28.94	10.4	1 16 59.8	1.47	0.695 4928	0.637 6964	0.640 3556
12	358 36 39.7	5 28.99	10.0	1 17 5.6	1.43	0.695 4608	0.643 0563	0.645 7938
16	358 58 35.7	5 29.03	9.7	1 17 11.2	1.38	0.695 4296	0.648 5638	0.651 3617
20	359 20 31.9	5 29.08	+ 9.4	−1 17 16.7	−1.33	0.695 3992	0.654 1831	0.657 0241
24	359 42 28.3	5 29.12	9.1	1 17 21.9	1.29	0.695 3696	0.659 8812	0.662 7508
28	0 4 24.9	5 29.17	8.8	1 17 27.0	1.24	0.695 3407	0.665 6293	0.668 5129
Dec. 2	0 26 21.7	5 29.21	8.5	1 17 31.8	1.19	0.695 3127	0.671 3982	0.674 2818
6	0 48 18.6	5 29.25	8.1	1 17 36.5	1.14	0.695 2854	0.677 1602	0.680 0301
10	1 10 15.7	5 29.29	+ 7.8	−1 17 41.0	−1.10	0.695 2589	0.682 8882	0.685 7311
14	1 32 13.0	5 29.33	7.5	1 17 45.3	1.05	0.695 2332	0.688 5560	0.691 3604
18	1 54 10.4	5 29.37	7.1	1 17 49.4	1.00	0.695 2083	0.694 1419	0.696 8981
22	2 16 8.0	5 29.41	6.8	1 17 53.3	0.95	0.695 1842	0.699 6271	0.702 3269
26	2 38 5.7	5 29.44	6.5	1 17 57.0	0.91	0.695 1609	0.704 9955	0.707 6310
30	3 0 3.5	5 29.48	+ 6.2	−1 18 0.6	−0.86	0.695 1384	0.710 2317	0.712 7958
34	3 22 1.5	5 29.51	+ 5.9	−1 18 3.9	−0.81	0.695 1166	0.715 3216	

SATURN.

GREENWICH MEAN NOON.

Date.		Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance fr Earth—	
								At Date.	At Interm diate Date
		° ′ ″	′ ″	′ ″	° ′ ″	″			
Jan.	0	89 12 37.0	2 14.74	−1 11.8	−1 0 13.2	+5.36	0.954 9047	0.905 6163	0.905 9
	4	89 21 35.9	2 14.74	1 11.4	0 59 51.8	5.37	0.954 9027	0.906 4414	0.906 95
	8	89 30 34.9	2 14.74	1 11.1	0 59 30.3	5.37	0.954 9009	0.907 5275	0.908 16
	12	89 39 33.8	2 14.74	1 10.8	0 59 8.8	5.38	0.954 8993	0.908 8669	0.909 6
	16	89 48 32.8	2 14.74	1 10.5	0 58 47.3	5.39	0.954 8978	0.910 4495	0.911 32
	20	89 57 31.8	2 14.74	−1 10.1	−0 58 25.7	+5.39	0.954 8965	0.912 2624	0.913 25
	24	90 6 30.7	2 14.74	1 9.8	0 58 4.1	5.40	0.954 8953	0.914 2902	0.915 37
	28	90 15 29.7	2 14.74	1 9.4	0 57 42.5	5.40	0.954 8943	0.916 5164	0.917 69
Feb.	1	90 24 28.7	2 14.74	1 9.0	0 57 20.9	5.41	0.954 8934	0.918 9241	0.920 1
	5	90 33 27.6	2 14.74	1 8.7	0 56 59.2	5.42	0.954 8927	0.921 4963	0.922 83
	9	90 42 26.6	2 14.74	−1 8.3	−0 56 37.6	+5.42	0.954 8922	0.924 2164	0.925 62
	13	90 51 25.6	2 14.74	1 8.0	0 56 15.9	5.43	0.954 8918	0.927 0665	0.928 53
	17	91 0 24.6	2 14.75	1 7.6	0 55 54.1	5.43	0.954 8916	0.930 0276	0.931 54
	21	91 9 23.6	2 14.75	1 7.2	0 55 32.4	5.44	0.954 8915	0.933 0802	0.934 63
	25	91 18 22.5	2 14.75	1 6.8	0 55 10.6	5.44	0.954 8916	0.936 2052	0.937 78
Mar.	1	91 27 21.5	2 14.75	−1 6.5	−0 54 48.8	+5.45	0.954 8919	0.939 3845	0.940 9
	5	91 36 20.5	2 14.75	1 6.1	0 54 27.0	5.46	0.954 8922	0.942 6017	0.944 219
	9	91 45 19.5	2 14.75	1 5.7	0 54 5.2	5.46	0.954 8927	0.945 8410	0.947 46
	13	91 54 18.5	2 14.75	1 5.4	0 53 43.3	5.47	0.954 8935	0.949 0870	0.950 70
	17	92 3 17.5	2 14.75	1 5.0	0 53 21.4	5.47	0.954 8944	0.952 3236	0.953 93
	21	92 12 16.4	2 14.74	−1 4.6	−0 52 59.5	+5.48	0.954 8954	0.955 5355	0.957 12
	25	92 21 15.4	2 14.74	1 4.2	0 52 37.6	5.48	0.954 8966	0.958 7083	0.960 27
	29	92 30 14.4	2 14.74	1 3.8	0 52 15.7	5.49	0.954 8979	0.961 8294	0.963 367
Apr.	2	92 39 13.4	2 14.74	1 3.4	0 51 53.7	5.49	0.954 8994	0.964 8876	0.966 38
	6	92 48 12.4	2 14.74	1 3.0	0 51 31.7	5.50	0.954 9011	0.967 8728	0.969 335
	10	92 57 11.3	2 14.74	−1 2.7	−0 51 9.7	+5.50	0.954 9029	0.970 7752	0.972 10
	14	93 6 10.3	2 14.74	1 2.3	0 50 47.7	5.51	0.954 9049	0.973 5847	0.974 951
	18	93 15 9.3	2 14.74	1 1.9	0 50 25.6	5.51	0.954 9070	0.976 2917	0.977 604
	22	93 24 8.2	2 14.74	1 1.5	0 50 3.6	5.52	0.954 9093	0.978 8876	0.980 1417
	26	93 33 7.2	2 14.74	1 1.1	0 49 41.5	5.53	0.954 9117	0.981 3655	0.982 5583
	30	93 42 6.1	2 14.74	−1 0.7	−0 49 19.4	+5.53	0.954 9143	0.983 7196	0.984 8487
May	4	93 51 5.1	2 14.74	1 0.3	0 48 57.2	5.54	0.954 9171	0.985 9449	0.987 0077
	8	94 0 4.0	2 14.73	0 59.9	0 48 35.1	5.54	0.954 9200	0.988 0364	0.989 0302
	12	94 9 3.0	2 14.73	0 59.5	0 48 12.9	5.54	0.954 9231	0.989 9884	0.990 9105
	16	94 18 1.9	2 14.73	0 59.1	0 47 50.7	5.55	0.954 9263	0.991 7959	0.992 6441
	20	94 27 0.8	2 14.73	−0 58.7	−0 47 28.5	+5.55	0.954 9297	0.993 4547	0.994 2273
	24	94 35 59.7	2 14.73	0 58.2	0 47 6.3	5.56	0.954 9332	0.994 9615	0.995 6573
	28	94 44 58.6	2 14.73	0 57.8	0 46 44.1	5.56	0.954 9369	0.996 3144	0.996 9327
June	1	94 53 57.5	2 14.72	0 57.4	0 46 21.8	5.57	0.954 9408	0.997 5119	0.998 0516
	5	95 2 56.4	2 14.72	0 57.0	0 45 59.5	5.57	0.954 9448	0.998 5516	0.999 0115
	9	95 11 55.3	2 14.72	−0 56.6	−0 45 37.2	+5.58	0.954 9490	0.999 4310	0.999 8000
	13	95 20 54.2	2 14.72	0 56.2	0 45 14.9	5.58	0.954 9533	1.000 1480	1.000 4450
	17	95 29 53.1	2 14.72	0 55.8	0 44 52.5	5.59	0.954 9578	1.000 7009	1.000 9156
	21	95 38 51.9	2 14.71	0 55.4	0 44 30.2	5.59	0.954 9625	1.001 0892	1.001 2217
	25	95 47 50.8	2 14.71	0 54.9	0 44 7.8	5.60	0.954 9673	1.001 3131	1.001 3636
	29	95 56 49.6	2 14.71	−0 54.5	−0 43 45.4	+5.60	0.954 9723	1.001 3731	1.001 3416
July	3	96 5 48.5	2 14.71	−0 54.1	−0 43 23.0	+5.61	0.954 9774	1.001 2691	1.001 1555

SATURN.

GREENWICH MEAN NOON.

ate.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	′ ″	′ ″	° ′ ″	″			
y 3	96 5 48.5	2 14.71	−0 54.1	−0 43 23.0	+5.61	0.954 9774	1.001 2691	1.001 1555
7	96 14 47.3	2 14.70	0 53.7	0 43 0.6	5.61	0.954 9827	1.001 0007	1.000 8047
11	96 23 46.1	2 14.70	0 53.2	0 42 38.1	5.61	0.954 9881	1.000 5675	1.000 2891
15	96 32 44.9	2 14.70	0 52.8	0 42 15.7	5.62	0.954 9937	0.999 9699	0.999 6099
19	96 41 43.7	2 14.70	0 52.4	0 41 53.2	5.62	0.954 9995	0.999 2095	0.998 7689
23	96 50 42.5	2 14.69	−0 52.0	−0 41 30.7	+5.63	0.955 0054	0.998 2885	0.997 7685
27	96 59 41.2	2 14.69	0 51.5	0 41 8.2	5.63	0.955 0115	0.997 2093	0.996 6110
31	97 8 40.0	2 14.69	0 51.1	0 40 45.7	5.63	0.955 0177	0.995 9738	0.995 2978
g. 4	97 17 38.7	2 14.68	0 50.6	0 40 23.1	5.64	0.955 0241	0.994 5833	0.993 8306
8	97 26 37.4	2 14.68	0 50.2	0 40 0.6	5.64	0.955 0306	0.993 0401	0.992 2121
12	97 35 36.1	2 14.68	−0 49.8	−0 39 38.0	+5.65	0.955 0373	0.991 3468	0.990 4450
16	97 44 34.8	2 14.67	0 49.3	0 39 15.4	5.65	0.955 0442	0.989 5072	0.988 5343
20	97 53 33.5	2 14.67	0 48.9	0 38 52.8	5.65	0.955 0512	0.987 5267	0.986 4850
24	98 2 32.2	2 14.66	0 48.4	0 38 30.2	5.66	0.955 0584	0.985 4099	0.984 3020
28	98 11 30.8	2 14.66	0 48.0	0 38 7.5	5.66	0.955 0657	0.983 1618	0.981 9898
pt. 1	98 20 29.5	2 14.66	−0 47.6	−0 37 44.9	+5.66	0.955 0732	0.980 7867	0.979 5532
5	98 29 28.1	2 14.65	0 47.1	0 37 22.2	5.67	0.955 0808	0.978 2901	0.976 9983
9	98 38 26.7	2 14.65	0 46.7	0 36 59.5	5.67	0.955 0886	0.975 6786	0.974 3321
13	98 47 25.3	2 14.64	0 46.2	0 36 36.8	5.68	0.955 0965	0.972 9599	0.971 5632
17	98 56 23.9	2 14.64	0 45.8	0 36 14.1	5.68	0.955 1046	0.970 1431	0.968 7008
21	99 5 22.4	2 14.64	−0 45.3	−0 35 51.4	+5.68	0.955 1129	0.967 2375	0.965 7543
25	99 14 21.0	2 14.63	0 44.9	0 35 28.7	5.69	0.955 1213	0.964 2525	0.962 7331
29	99 23 19.5	2 14.63	0 44.4	0 35 5.9	5.69	0.955 1298	0.961 1974	0.959 6466
t. 3	99 32 18.0	2 14.62	0 44.0	0 34 43.2	5.69	0.955 1385	0.958 0822	0.956 5059
7	99 41 16.5	2 14.62	0 43.5	0 34 20.4	5.70	0.955 1474	0.954 9193	0.953 3241
11	99 50 14.9	2 14.61	−0 43.0	−0 33 57.6	+5.70	0.955 1564	0.951 7219	0.950 1148
15	99 59 13.4	2 14.61	0 42.6	0 33 34.8	5.70	0.955 1656	0.948 5047	0.946 8936
19	100 8 11.8	2 14.60	0 42.1	0 33 12.0	5.71	0.955 1749	0.945 2831	0.943 6750
23	100 17 10.2	2 14.60	0 41.7	0 32 49.2	5.71	0.955 1844	0.942 0712	0.940 4738
27	100 26 8.6	2 14.59	0 41.2	0 32 26.3	5.71	0.955 1941	0.938 8846	0.937 3056
31	100 35 6.9	2 14.59	−0 40.8	−0 32 3.5	+5.71	0.955 2039	0.935 7390	0.934 1870
ov. 4	100 44 5.2	2 14.58	0 40.3	0 31 40.6	5.72	0.955 2138	0.932 6518	0.931 1359
8	100 53 3.5	2 14.58	0 39.8	0 31 17.7	5.72	0.955 2239	0.929 6417	0.928 1715
12	101 2 1.8	2 14.57	0 39.4	0 30 54.8	5.72	0.955 2342	0.926 7277	0.925 3127
16	101 11 0.1	2 14.56	0 38.9	0 30 31.9	5.73	0.955 2446	0.923 9287	0.922 5780
20	101 19 58.3	2 14.56	−0 38.4	−0 30 9.0	+5.73	0.955 2552	0.921 2626	0.919 9847
24	101 28 56.6	2 14.55	0 38.0	0 29 46.1	5.73	0.955 2659	0.918 7465	0.917 5500
28	101 37 54.8	2 14.55	0 37.5	0 29 23.2	5.74	0.955 2768	0.916 3975	0.915 2912
ec. 2	101 46 52.9	2 14.54	0 37.0	0 29 0.2	5.74	0.955 2878	0.914 2332	0.913 2256
6	101 55 51.1	2 14.53	0 36.6	0 28 37.3	5.74	0.955 2990	0.912 2706	0.911 3703
10	102 4 49.2	2 14.53	−0 36.1	−0 28 14.3	+5.74	0.955 3104	0.910 5266	0.909 7411
14	102 13 47.3	2 14.52	0 35.6	0 27 51.3	5.75	0.955 3219	0.909 0153	0.908 3505
18	102 22 45.4	2 14.51	0 35.1	0 27 28.3	5.75	0.955 3335	0.907 7480	0.907 2089
22	102 31 43.4	2 14.51	0 34.7	0 27 5.3	5.75	0.955 3453	0.906 7342	0.906 3250
26	102 40 41.4	2 14.50	0 34.2	0 26 42.3	5.75	0.955 3573	0.905 9822	0.905 7066
30	102 49 39.4	2 14.49	−0 33.7	−0 26 19.3	+5.76	0.955 3694	0.905 4988	0.905 3596
34	102 58 37.4	2 14.49	−0 33.2	−0 25 56.3	+5.76	0.955 3817	0.905 2894	0.905 2884

URANUS.

GREENWICH MEAN NOON.

Date.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance Earth— At Date.	At Inter diate D
	° ′ ″	″	″	° ′ ″	″			
Jan. 4	311 19 58.)	39.48	+8.4	−0 39 11.7	−0.28	1.298 6363	1.317 2525	1.317 8
12	311 25 14.7	39.47	8.5	0 39 14.0	0.28	1.298 6557	1.318 4110	1.318 8
20	311 30 30.5	39.47	8.5	0 39 16.2	0.28	1.298 6751	1.319 2068	1.319 4
28	311 35 46.2	39.47	8.5	0 39 18.5	0.28	1.298 6945	1.319 6291	1.319 6
Feb. 5	311 41 1.9	39.46	8.5	0 39 20.8	0.28	1.298 7139	1.319 6755	1.319 5
13	311 46 17.6	39.46	+8.4	−0 39 23.0	−0.28	1.298 7331	1.319 3464	1.319 0
21	311 51 33.3	39.46	8.4	0 39 25.2	0.28	1.298 7523	1.318 6458	1.318 1
Mar. 1	311 56 48.9	39.45	8.4	0 39 27.5	0.28	1.298 7715	1.317 5880	1.316 9
9	312 2 4.5	39.45	8.4	0 39 29.7	0.28	1.298 7907	1.316 1915	1.315 3
17	312 7 20.1	39.44	8.4	0 39 32.0	0.28	1.298 8097	1.314 4763	1.313 5
25	312 12 35.6	39.44	+8.3	−0 39 34.2	−0.28	1.298 8287	1.312 4699	1.311 3
Apr. 2	312 17 51.1	39.44	8.3	0 39 36.4	0.28	1.298 8477	1.310 2069	1.308 9
10	312 23 6.6	39.43	8.3	0 39 38.6	0.28	1.298 8667	1.307 7228	1.306 4
18	312 28 22.0	39.43	8.3	0 39 40.8	0.28	1.298 8857	1.305 0566	1.303 6
26	312 33 37.4	39.42	8.3	0 39 43.0	0.28	1.298 9045	1.302 2551	1.300 8
May 4	312 38 52.8	39.42	+8.3	−0 39 45.2	−0.28	1.298 9233	1.299 3667	1.297 9
12	312 44 8.2	39.42	8.3	0 39 47.4	0.27	1.298 9420	1.296 4398	1.294 9
20	312 49 23.5	39.42	8.2	0 39 49.6	0.27	1.298 9607	1.293 5279	1.292 0
28	312 54 38.8	39.41	8.2	0 39 51.8	0.27	1.298 9793	1.290 6873	1.289 3
June 5	312 59 54.0	39.41	8.2	0 39 54.0	0.27	1.298 9979	1.287 9709	1.286 6
13	313 5 9.3	39.41	+8.2	−0 39 56.1	−0.27	1.299 0164	1.285 4312	1.284 2
21	313 10 24.5	39.40	8.2	0 39 58.3	0.27	1.299 0349	1.283 1229	1.282 0
29	313 15 39.7	39.40	8.2	0 40 0.4	0.27	1.299 0533	1.281 0947	1.280 1
July 7	313 20 54.8	39.39	8.2	0 40 2.6	0.27	1.299 0717	1.279 3883	1.278 6
15	313 26 9.9	39.39	8.2	0 40 4.7	0.27	1.299 0899	1.278 0438	1.277 5
23	313 31 24.9	39.39	+8.2	−0 40 6.9	−0.27	1.299 1081	1.277 0940	1.276 7
31	313 36 40.0	39.38	8.1	0 40 9.0	0.27	1.299 1264	1.276 5598	1.276 4
Aug. 8	313 41 55.0	39.38	8.1	0 40 11.1	0.27	1.299 1446	1.276 4549	1.276 5
16	313 47 10.0	39.37	8.1	0 40 13.2	0.27	1.299 1627	1.276 7864	1.277 1
24	313 52 24.9	39.37	8.1	0 40 15.3	0.27	1.299 1807	1.277 5470	1.278 0
Sept. 1	313 57 39.9	39.36	+8.1	−0 40 17.4	−0.26	1.299 1987	1.278 7194	1.279 4
9	314 2 54.8	39.36	8.1	0 40 19.5	0.26	1.299 2167	1.280 2811	1.281 1
17	314 8 9.6	39.36	8.0	0 40 21.6	0.26	1.299 2346	1.282 1993	1.283 2
25	314 13 24.4	39.35	8.0	0 40 23.7	0.26	1.299 2525	1.284 4300	1.285 6
Oct. 3	314 18 39.2	39.35	8.0	0 40 25.8	0.26	1.299 2704	1.286 9265	1.288 2
11	314 23 54.0	39.34	+8.0	−0 40 27.9	−0.26	1.299 2882	1.289 6388	1.291 0
19	314 29 8.7	39.34	8.0	0 40 30.0	0.26	1.299 3059	1.292 5097	1.293 9
27	314 34 23.4	39.34	8.0	0 40 32.0	0.26	1.299 3236	1.295 4798	1.296 9
Nov. 4	314 39 38.1	39.33	8.0	0 40 34.1	0.26	1.299 3412	1.298 4933	1.299 9
12	314 44 52.8	39.33	7.9	0 40 36.2	0.25	1.299 3588	1.301 4933	1.302 9
20	314 50 7.4	39.33	+7.9	−0 40 38.2	−0.25	1.299 3763	1.304 4212	1.305 84
28	314 55 22.0	39.32	7.9	0 40 40.2	0.25	1.299 3938	1.307 2259	1.308 56
Dec. 6	315 0 36.5	39.32	7.9	0 40 42.3	0.25	1.299 4112	1.309 8604	1.311 09
14	315 5 51.0	39.31	7.9	0 40 44.3	0.25	1.299 4286	1.312 2777	1.313 39
22	315 11 5.5	39.31	7.9	0 40 46.3	0.25	1.299 4459	1.314 4376	1.315 41
30	315 16 20.0	39.30	+7.8	−0 40 48.3	−0.25	1.299 4631	1.316 3085	1.317 12
38	315 21 34.4	39.30	+7.8	−0 40 50.3	−0.25	1.299 4803	1.317 8610	1.318 50

NEPTUNE.

GREENWICH MEAN NOON.

ate.	Heliocentric Longitude, Mean Equinox of Date.	Daily Motion.	Reduction to Orbit.	Heliocentric Latitude.	Daily Motion.	Logarithm of Radius Vector.	Logarithm of Distance from Earth—	
							At Date.	At Intermediate Date.
	° ′ ″	″	″	° ′ ″	″			
. 4	118 57 47.3	21.73	−20.0	−0 21 58.3	+0.66	1.477 1163	1.463 2254	1.462 9684
12	119 0 41.1	21.73	19.9	0 21 53.0	0.66	1.477 1198	1.462 7844	1.462 6745
20	119 3 34.9	21.73	19.9	0 21 47.8	0.66	1.477 1234	1.462 6396	1.462 6798
28	119 6 28.7	21.73	19.8	0 21 42.5	0.66	1.477 1269	1.462 7942	1.462 9818
. 5	119 9 22.5	21.73	19.7	0 21 37.3	0.66	1.477 1304	1.463 2417	1.463 5725
13	119 12 16.3	21.73	−19.6	−0 21 32.0	+0.66	1.477 1340	1.463 9723	1.464 4386
21	119 15 10.1	21.73	19.6	0 21 26.7	0.66	1.477 1375	1.464 9685	1.465 5585
r. 1	119 18 3.9	21.73	19.5	0 21 21.5	0.66	1.477 1411	1.466 2050	1.466 9042
9	119 20 57.7	21.73	19.4	0 21 16.2	0.66	1.477 1447	1.467 6525	1.468 4459
17	119 23 51.6	21.73	19.3	0 21 10.9	0.66	1.477 1482	1.469 2799	1.470 1499
25	119 26 45.4	21.73	−19.2	−0 21 5.6	+0.66	1.477 1518	1.471 0509	1.471 9780
r. 2	119 29 39.2	21.73	19.2	0 21 0.4	0.66	1.477 1554	1.472 9267	1.473 8924
10	119 32 33.0	21.73	19.1	0 20 55.1	0.66	1.477 1590	1.474 8705	1.475 8562
18	119 35 26.8	21.73	19.0	0 20 49.8	0.66	1.477 1626	1.476 8447	1.477 8311
26	119 38 20.6	21.73	19.0	0 20 44.6	0.66	1.477 1662	1.478 8107	1.479 7793
y 4	119 41 14.4	21.73	−18.9	−0 20 39.3	+0.66	1.477 1698	1.480 7330	1.481 6679
12	119 44 8.2	21.73	18.8	0 20 34.0	0.66	1.477 1734	1.482 5800	1.483 4653
20	119 47 2.0	21.73	18.7	0 20 28.7	0.66	1.477 1771	1.484 3199	1.485 1403
28	119 49 55.8	21.73	18.6	0 20 23.4	0.66	1.477 1807	1.485 9234	1.486 6667
ne 5	119 52 49.6	21.73	18.6	0 20 18.2	0.66	1.477 1844	1.487 3673	1.488 0225
13	119 55 43.5	21.73	−18.5	−0 20 12.9	+0.66	1.477 1880	1.488 6297	1.489 1863
21	119 58 37.3	21.73	18.4	0 20 7.6	0.66	1.477 1917	1.489 6903	1.490 1401
29	120 1 31.1	21.73	18.3	0 20 2.3	0.66	1.477 1953	1.490 5344	1.490 8719
ly 7	120 4 24.9	21.73	18.2	0 19 57.0	0.66	1.477 1990	1.491 1512	1.491 3710
15	120 7 18.7	21.73	18.2	0 19 51.8	0.66	1.477 2027	1.491 5303	1.491 6286
23	120 10 12.5	21.73	−18.1	−0 19 46.5	+0.66	1.477 2064	1.491 6656	1.491 6415
31	120 13 6.4	21.73	18.0	0 19 41.2	0.66	1.477 2101	1.491 5564	1.491 4103
ug. 8	120 16 0.2	21.73	17.9	0 19 35.9	0.66	1.477 2138	1.491 2035	1.490 9363
16	120 18 54.0	21.73	17.9	0 19 30.6	0.66	1.477 2175	1.490 6097	1.490 2251
24	120 21 47.8	21.73	17.8	0 19 25.3	0.66	1.477 2212	1.489 7840	1.489 2880
ept. 1	120 24 41.6	21.73	−17.7	−0 19 20.0	+0.66	1.477 2249	1.488 7385	1.488 1374
9	120 27 35.5	21.73	17.6	0 19 14.8	0.66	1.477 2286	1.487 4867	1.486 7889
17	120 30 29.3	21.73	17.6	0 19 9.5	0.66	1.477 2324	1.486 0468	1.485 2636
25	120 33 23.1	21.73	17.5	0 19 4.2	0.66	1.477 2361	1.484 4423	1.483 5860
ct. 3	120 36 16.9	21.73	17.4	0 18 58.9	0.66	1.477 2398	1.482 6980	1.481 7818
11	120 39 10.8	21.73	−17.3	−0 18 53.6	+0.66	1.477 2436	1.480 8415	1.479 8815
19	120 42 4.6	21.73	17.2	0 18 48.3	0.66	1.477 2473	1.478 9063	1.477 9202
27	120 44 58.4	21.73	17.2	0 18 43.0	0.66	1.477 2510	1.476 9276	1.475 9328
Nov. 4	120 47 52.3	21.73	17.1	0 18 37.7	0.66	1.477 2548	1.474 9405	1.473 9559
12	120 50 46.1	21.73	17.0	0 18 32.4	0.66	1.477 2585	1.472 9843	1.472 0308
20	120 53 39.9	21.73	−16.9	−0 18 27.1	+0.66	1.477 2623	1.471 1002	1.470 1971
28	120 56 33.8	21.73	16.8	0 18 21.8	0.66	1.477 2660	1.469 3263	1.468 4924
Dec. 6	120 59 27.6	21.73	16.8	0 18 16.5	0.66	1.477 2698	1.467 7003	1.466 9547
14	121 2 21.4	21.73	16.7	0 18 11.2	0.66	1.477 2735	1.466 2601	1.465 6203
22	121 5 15.3	21.73	16.6	0 18 5.9	0.66	1.477 2773	1.465 0387	1.464 5185
30	121 8 9.1	21.73	−16.5	−0 18 0.6	+0.66	1.477 2811	1.464 0627	1.463 6743
38	121 11 3.0	21.73	−16.5	−0 17 55.3	+0.66	1.477 2848	1.463 3559	1.463 1097

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Redu to Mea Eq'x Jan
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noo*
Jan. 1	+0.170 8904	+0.179 4931	−429	−0.888 2779	−0.886 8457	−206	−0.385 3545	−0.384 7334	+284
2	0.188 0821	0.196 6565	436	0.885 3447	0.883 7753	214	0.384 0826	0.383 4020	279
3	0.205 2158	0.213 7593	443	0.882 1374	0.880 4312	223	0.382 6918	0.381 9519	274
4	0.222 2865	0.230 7967	450	0.878 6567	0.876 8140	232	0.381 1824	0.380 3833	269
5	0.239 2892	0.247 7635	457	0.874 9032	0.872 9245	241	0.379 5547	0.378 6967	264
6	+0.256 2189	+0.264 6548	−464	−0.870 8780	−0.868 7639	−250	−0.377 8092	−0.376 8924	+259
7	0.273 0706	0.281 4655	471	0.866 5822	0.864 3331	259	0.375 9463	0.374 9709	254
8	0.289 8389	0.298 1902	477	0.862 0167	0.859 6331	268	0.373 9662	0.372 9324	248
9	0.306 5187	0.314 8238	483	0.857 1825	0.854 6651	278	0.371 8695	0.370 7775	242
10	0.323 1047	0.331 3608	489	0.852 0810	0.849 4303	288	0.369 6566	0.368 5068	236
11	+0.339 5914	+0.347 7958	−495	−0.846 7133	−0.843 9301	−298	−0.367 3281	−0.366 1207	+230
12	0.355 9734	0.364 1235	500	0.841 0809	0.838 1659	308	0.364 8846	0.363 6199	224
13	0.372 2454	0.380 3384	505	0.835 1853	0.832 1394	318	0.362 3268	0.361 0052	218
14	0.388 4019	0.396 4351	509	0.829 0285	0.825 8527	329	0.359 6554	0.358 2774	211
15	0.404 4373	0.412 4079	513	0.822 6123	0.819 3076	340	0.356 8713	0.355 4373	204
16	+0.420 3463	+0.428 2518	−517	−0.815 9388	−0.812 5064	−351	−0.353 9755	−0.352 4861	+197
17	0.436 1237	0.443 9614	520	0.809 0105	0.805 4515	362	0.350 9692	0.349 4249	190
18	0.451 7642	0.459 5315	523	0.801 8297	0.798 1455	373	0.347 8534	0.346 2548	183
19	0.467 2627	0.474 9573	526	0.794 3991	0.790 5910	384	0.344 6292	0.342 9769	176
20	0.482 6146	0.490 2343	528	0.786 7215	0.782 7909	395	0.341 2979	0.339 5924	168
21	+0.497 8151	+0.505 3572	−530	−0.778 7995	−0.774 7477	−406	−0.337 8606	−0.336 1027	+160
22	0.512 8597	0.520 3220	−532	0.770 6358	0.766 4643	418	0.334 3187	0.332 5088	152
23	0.527 7435	0.535 1238	533	0.762 2334	0.757 9436	430	0.330 6732	0.328 8120	144
24	0.542 4622	0.549 7585	534	0.753 5952	0.749 1886	442	0.326 9255	0.325 0138	136
25	0.557 0119	0.564 2219	534	0.744 7242	0.740 2023	454	0.323 0771	0.321 1154	127
26	+0.571 3880	+0.578 5097	−534	−0.735 6233	−0.730 9876	−466	−0.319 1290	−0.317 1180	+119
27	0.585 5864	0.592 6178	534	0.726 2956	0.721 5477	478	0.315 0827	0.313 0231	110
28	0.599 6032	0.606 5422	533	0.716 7442	0.711 8856	490	0.310 9395	0.308 8320	101
29	0.613 4343	0.620 2791	532	0.706 9722	0.702 0044	502	0.306 7007	0.304 5459	92
30	0.627 0761	0.633 8247	530	0.696 9826	0.691 9071	514	0.302 3676	0.300 1661	83
31	+0.640 5245	+0.647 1750	−528	−0.686 7784	−0.681 5969	−526	−0.297 9416	−0.295 6941	+ 74
Feb. 1	0.653 7757	0.660 3264	526	0.676 3629	0.671 0768	538	0.293 4238	0.291 1309	65
2	0.666 8264	0.673 2753	523	0.665 7390	0.660 3498	550	0.288 8155	0.286 4779	56
3	0.679 6725	0.686 0177	520	0.654 9097	0.649 4190	561	0.284 1182	0.281 7365	47
4	0.692 3103	0.698 5498	516	0.643 8782	0.638 2876	572	0.279 3331	0.276 9080	37
5	+0.704 7358	+0.710 8679	−512	−0.632 6477	−0.626 9587	−584	−0.274 4615	−0.271 9938	+ 28
6	0.716 9455	0.722 9683	508	0.621 2211	0.615 4355	596	0.269 5049	0.266 9950	19
7	0.728 9354	0.734 8467	503	0.609 6021	0.603 7214	607	0.264 4644	0.261 9132	+ 9
8	0.740 7015	0.746 4995	498	0.597 7939	0.591 8200	618	0.259 3416	0.256 7499	− 1
9	0.752 2401	0.757 9229	493	0.585 8001	0.579 7348	629	0.254 1383	0.251 5068	11
10	+0.763 5473	+0.769 1129	−487	−0.573 6244	−0.567 4695	−640	−0.248 8558	−0.246 1854	− 20
11	0.774 6192	0.780 0659	481	0.561 2705	0.555 0280	651	0.243 4959	0.240 7875	30
12	0.785 4524	0.790 7783	474	0.548 7425	0.542 4145	662	0.238 0604	0.235 3148	40
13	0.796 0432	0.801 2466	467	0.536 0444	0.529 6329	673	0.232 5509	0.229 7691	50
14	0.806 3881	0.811 4673	460	0.523 1804	0.516 6876	683	0.226 9695	0.224 1524	60
15	+0.816 4839	+0.821 4374	−452	−0.510 1549	−0.503 5830	−693	−0.221 3180	−0.218 4666	− 70
16	+0.826 3275	+0.831 1539	−444	−0.496 9724	−0.490 3236	−703	−0.215 5984	−0.212 7137	− 80

FOR GREENWICH MEAN NOON AND MIDNIGHT.

te.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
16	+0.826 3275	+0.831 1539	−444	−0.496 9724	−0.490 3236	−703	−0.215 5984	−0.212 7137	− 80
17	0.835 9161	0.840 6138	435	0.483 6373	0.476 9139	713	0.209 8127	0.206 8957	90
18	0.845 2468	0.849 8147	426	0.470 1541	0.463 3583	723	0.203 9629	0.201 0144	100
19	0.854 3172	0.858 7540	417	0.456 5271	0.449 6612	733	0.198 0507	0.195 0719	110
20	0.863 1247	0.867 4291	408	0.442 7611	0.435 8273	742	0.192 0784	0.189 0703	120
21	+0.871 6669	+0.875 8379	−398	−0.428 8605	−0.421 8611	−751	−0.186 0479	−0.183 0114	−130
22	0.879 9418	0.883 9783	388	0.414 8298	0.407 7671	760	0.179 9611	0.176 8972	141
23	0.887 9472	0.891 8482	377	0.400 6735	0.393 5497	769	0.173 8200	0.170 7297	151
24	0.895 6811	0.899 4456	366	0.386 3962	0.379 2135	778	0.167 6265	0.164 5107	161
25	0.903 1416	0.906 7688	355	0.372 0023	0.364 7630	787	0.161 3825	0.158 2422	171
26	+0.910 3270	+0.913 8160	−344	−0.357 4963	−0.350 2027	−795	−0.155 0900	−0.151 9261	−181
27	0.917 2357	0.920 5858	332	0.342 8827	0.335 5369	803	0.148 7509	0.145 5646	191
28	0.923 8662	0.927 0765	320	0.328 1658	0.320 7700	811	0.142 3670	0.139 1589	201
r. 1	0.930 2167	0.933 2865	307	0.313 3500	0.305 9064	819	0.135 9402	0.132 7113	211
2	0.936 2859	0.939 2146	294	0.298 4396	0.290 9503	826	0.129 4723	0.126 2235	221
3	+0.942 0725	+0.944 8593	−281	−0.283 4388	−0.275 9058	−833	−0.122 9651	−0.119 6974	−231
4	0.947 5748	0.950 2188	268	0.268 3517	0.260 7772	840	0.116 4205	0.113 1347	241
5	0.952 7912	0.955 2918	254	0.253 1828	0.245 5689	847	0.109 8402	0.106 5372	251
6	0.957 7203	0.960 0765	240	0.237 9362	0.230 2852	854	0.103 2260	0.099 9068	261
7	0.962 3603	0.964 5714	226	0.222 6164	0.214 9305	860	0.096 5799	0.093 2455	271
8	+0.966 7098	+0.968 7752	−212	−0.207 2279	−0.199 5093	−866	−0.089 9038	−0.086 5551	−281
9	0.970 7675	0.972 6864	197	0.191 7752	0.184 0262	872	0.083 1997	0.079 8378	291
10	0.974 5318	0.976 3035	182	0.176 2630	0.168 4861	878	0.076 4696	0.073 0954	300
11	0.978 0013	0.979 6251	167	0.160 6961	0.152 8938	883	0.069 7156	0.066 3303	309
12	0.981 1749	0.982 6505	152	0.145 0794	0.137 2539	888	0.062 9399	0.059 5446	319
13	+0.984 0517	+0.985 3785	−137	−0.129 4179	−0.121 5719	−893	−0.056 1448	−0.052 7406	−328
14	0.986 6309	0.987 8086	121	0.113 7165	0.105 8524	897	0.049 3324	0.045 9204	337
15	0.988 9117	0.989 9399	105	0.097 9802	0.090 1006	901	0.042 5049	0.039 0862	346
16	0.990 8934	0.991 7721	89	0.082 2142	0.074 3217	905	0.035 6646	0.032 2403	355
17	0.992 5759	0.993 3049	72	0.066 4236	0.058 5206	909	0.028 8136	0.025 3849	364
18	+0.993 9590	+0.994 5383	− 55	−0.050 6133	−0.042 7024	−912	−0.021 9543	−0.018 5221	−373
19	0.995 0427	0.995 4722	38	0.034 7885	0.026 8722	915	0.015 0887	0.011 6543	382
20	0.995 8269	0.996 1068	21	0.018 9541	−0.011 0348	918	0.008 2192	−0.004 7836	390
21	0.996 3119	0.996 4423	− 3	−0.003 1150	+0.004 8048	921	−0.001 3478	+0.002 0880	398
22	0.996 4981	0.996 4793	+ 14	+0.012 7239	0.020 6417	923	+0.005 5234	0.008 9582	406
23	+0.996 3860	+0.996 2183	+ 32	+0.028 5577	+0.036 4712	−925	+0.012 3922	+0.015 8251	−414
24	0.995 9762	0.995 6599	50	0.044 3816	0.052 2884	926	0.019 2567	0.022 6866	422
25	0.995 2694	0.994 8049	68	0.060 1910	0.068 0887	927	0.026 1147	0.029 5406	430
26	0.994 2664	0.993 6541	86	0.075 9810	0.083 8674	928	0.032 9642	0.036 3852	438
27	0.992 9680	0.992 2083	104	0.091 7472	0.099 6199	929	0.039 8034	0.043 2185	446
28	+0.991 3752	+0.990 4687	+122	+0.107 4850	+0.115 3420	−929	+0.046 6302	+0.050 0384	−454
29	0.989 4889	0.988 4361	140	0.123 1902	0.131 0291	929	0.053 4429	0.056 8433	461
30	0.987 3103	0.986 1117	159	0.138 8583	0.146 6771	929	0.060 2395	0.063 6313	468
31	0.984 8404	0.983 4965	178	0.154 4851	0.162 2817	929	0.067 0184	0.070 4006	475
Apr. 1	0.982 0801	0.980 5913	197	0.170 0664	0.177 8387	929	0.073 7776	0.077 1492	482
2	+0.979 0302	+0.977 3970	+216	+0.185 5980	+0.193 3439	−928	+0.080 5153	+0.083 8756	−489
3	+0.975 6917	+0.973 9145	+235	+0.201 0758	+0.208 7931	−927	+0.087 2299	+0.090 5779	−496

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Red to Me Eq'x Jan
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*N*
Apr. 1	+0.982 0801	+0.980 5913	+ 197	+0.170 0664	+0.177 8387	−929	+0.073 7776	+0.077 1492	−48
2	0.979 0302	0.977 3970	216	0.185 5980	0.193 3439	928	0.080 5153	0.083 8756	48
3	0.975 6917	0.973 9145	235	0.201 0758	0.208 7931	927	0.087 2299	0.090 5779	49
4	0.972 0654	0.970 1446	254	0.216 4954	0.224 1821	926	0.093 9195	0.097 2543	50
5	0.968 1522	0.966 0884	274	0.231 8526	0.239 5064	925	0.100 5821	0.103 9027	50
6	+0.963 9533	+0.961 7469	+ 293	+0.247 1429	+0.254 7615	−923	+0.107 2158	+0.110 5212	−51
7	0.959 4695	0.957 1212	313	0.262 3617	0.269 9428	921	0.113 8186	0.117 1078	52
8	0.954 7021	0.952 2125	333	0.277 5044	0.285 0459	919	0.120 3886	0.123 6606	52
9	0.949 6524	0.947 0221	353	0.292 5667	0.300 0662	917	0.126 9236	0.130 1774	53
10	0.944 3218	0.941 5517	373	0.307 5438	0.314 9990	914	0.133 4217	0.136 6563	53
11	+0.938 7121	+0.935 8031	+ 393	+0.322 4311	+0.329 8396	−911	+0.139 8809	+0.143 0953	−54
12	0.932 8251	0.929 7782	413	0.337 2240	0.344 5837	908	0.146 2991	0.149 4922	54
13	0.926 6627	0.923 4788	433	0.351 9180	0.359 2264	904	0.152 6742	0.155 8450	55
14	0.920 2269	0.916 9072	453	0.366 5084	0.373 7634	900	0.159 0043	0.162 1518	555
15	0.913 5200	0.910 0655	474	0.380 9909	0.388 1903	895	0.165 2874	0.168 4107	559
16	+0.906 5443	+0.902 9565	+ 494	+0.395 3611	+0.402 5027	−890	+0.171 5216	+0.174 6198	−563
17	0.899 3024	0.895 5824	514	0.409 6146	0.416 6964	885	0.177 7051	0.180 7773	567
18	0.891 7969	0.887 9461	535	0.423 7474	0.430 7671	880	0.183 8361	0.186 8813	571
19	0.884 0304	0.880 0501	556	0.437 7551	0.444 7108	875	0.189 9127	0.192 9301	574
20	0.876 0057	0.871 8974	577	0.451 6337	0.458 5233	869	0.195 9332	0.198 9218	577
21	+0.867 7257	+0.863 4908	+ 597	+0.465 3792	+0.472 2009	−863	+0.201 8958	+0.204 8549	−580
22	0.859 1932	0.854 8331	618	0.478 9879	0.485 7397	857	0.207 7990	0.210 7277	583
23	0.850 4111	0.845 9274	639	0.492 4559	0.499 1360	851	0.213 6410	0.216 5386	585
24	0.841 3827	0.836 7771	660	0.505 7795	0.512 3860	844	0.219 4203	0.222 2860	587
25	0.832 1112	0.827 3853	681	0.518 9551	0.525 4864	837	0.225 1355	0.227 9685	589
26	+0.822 5997	+0.817 7548	+ 702	+0.531 9794	+0.538 4338	−830	+0.230 7850	+0.233 5847	−591
27	0.812 8510	0.807 8887	723	0.544 8491	0.551 2250	822	0.236 3676	0.239 1333	592
28	0.802 8683	0.797 7902	744	0.557 5610	0.563 8568	814	0.241 8818	0.244 6129	593
29	0.792 6547	0.787 4622	765	0.570 1119	0.576 3260	806	0.247 3264	0.250 0221	594
30	0.782 2130	0.776 9075	786	0.582 4986	0.588 6294	797	0.252 6999	0.255 3596	595
May 1	+0.771 5460	+0.766 1289	+ 807	+0.594 7180	+0.600 7640	−788	+0.258 0010	+0.260 6240	−595
2	0.760 6565	0.755 1293	828	0.606 7669	0.612 7265	779	0.263 2283	0.265 8138	595
3	0.749 5476	0.743 9118	849	0.618 6422	0.624 5137	769	0.268 3803	0.270 9277	595
4	0.738 2222	0.732 4793	870	0.630 3405	0.636 1222	759	0.273 4557	0.275 9642	595
5	0.726 6833	0.720 8347	890	0.641 8584	0.647 5486	749	0.278 4530	0.280 9219	595
6	+0.714 9338	+0.708 9811	+ 911	+0.653 1924	+0.658 7895	−739	+0.283 3706	+0.285 7990	−594
7	0.702 9770	0.696 9220	932	0.664 3394	0.669 8417	728	0.288 2069	0.290 5941	593
8	0.690 8165	0.684 6609	953	0.675 2959	0.680 7016	717	0.292 9605	0.295 3059	592
9	0.678 4558	0.672 2015	974	0.686 0584	0.691 3660	706	0.297 6301	0.299 9329	591
10	0.665 8985	0.659 5473	994	0.696 6239	0.701 8318	694	0.302 2142	0.304 4737	590
11	+0.653 1484	+0.646 7023	+1015	+0.706 9892	+0.712 0957	−682	+0.306 7112	+0.308 9267	−588
12	0.640 2094	0.633 6703	1036	0.717 1510	0.722 1546	670	0.311 1199	0.313 2906	586
13	0.627 0855	0.620 4555	1056	0.727 1063	0.732 0056	657	0.315 4388	0.317 5642	584
14	0.613 7808	0.607 0619	1076	0.736 8523	0.741 6460	644	0.319 6668	0.321 7463	581
15	0.600 2994	0.593 4938	1096	0.746 3863	0.751 0729	631	0.323 8027	0.325 8356	578
16	+0.586 6456	+0.579 7554	+1116	+0.755 7054	+0.760 2835	−617	+0.327 8451	+0.329 8310	−575
17	+0.572 8238	+0.565 8512	+1136	+0.764 8070	+0.769 2755	−603	+0.331 7931	+0.333 7314	−572

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
ay 17	+0.572 8238	+0.565 8512	+1136	+0.764 8070	+0.769 2755	−603	+0.331 7931	+0.333 7314	−572
18	0.558 8382	0.551 7853	1156	0.773 6886	0.778 0460	589	0.335 6456	0.337 5356	568
19	0.544 6931	0.537 5622	1176	0.782 3476	0.786 5930	574	0.339 4014	0.341 2427	564
20	0.530 3931	0.523 1864	1195	0.790 7820	0.794 9143	559	0.343 0596	0.344 8519	560
21	0.515 9427	0.508 6626	1215	0.798 9896	0.803 0077	544	0.346 6194	0.348 3621	556
22	+0.501 3465	+0.493 9951	+1234	+0.806 9683	+0.810 8712	−528	+0.350 0799	+0.351 7727	−551
23	0.486 6088	0.479 1883	1253	0.814 7162	0.818 5031	512	0.353 4404	0.355 0829	546
24	0.471 7341	0.464 2467	1272	0.822 2316	0.825 9015	495	0.356 7001	0.358 2919	541
25	0.456 7267	0.449 1746	1291	0.829 5127	0.833 0650	478	0.359 8582	0.361 3990	536
26	0.441 5910	0.433 9764	1310	0.836 5581	0.839 9919	461	0.362 9143	0.364 4039	530
27	+0.426 3313	+0.418 6562	+1328	+0.843 3663	+0.846 6810	−443	+0.365 8677	+0.367 3056	−524
28	0.410 9516	0.403 2181	1346	0.849 9358	0.853 1306	425	0.368 7176	0.370 1036	518
29	0.395 4561	0.387 6662	1364	0.856 2652	0.859 3394	407	0.371 4635	0.372 7973	512
30	0.379 8488	0.372 0044	1382	0.862 3530	0.865 3057	388	0.374 1048	0.375 3859	506
31	0.364 1335	0.356 2366	1399	0.868 1974	0.871 0279	369	0.376 6406	0.377 8688	499
une 1	+0.348 3142	+0.340 3670	+1416	+0.873 7970	+0.876 5045	−350	+0.379 0704	+0.380 2452	−492
2	0.332 3954	0.324 4000	1433	0.879 1502	0.881 7338	331	0.381 3932	0.382 5143	485
3	0.316 3812	0.308 3396	1450	0.884 2552	0.886 7141	311	0.383 6084	0.384 6754	478
4	0.300 2758	0.292 1903	1467	0.889 1103	0.891 4436	291	0.385 7152	0.386 7277	470
5	0.284 0838	0.275 9568	1483	0.893 7139	0.895 9210	271	0.387 7129	0.388 6707	462
6	+0.267 8098	+0.259 6435	+1499	+0.898 0648	+0.900 1449	−250	+0.389 6009	+0.390 5035	−454
7	0.251 4585	0.243 2553	1515	0.902 1613	0.904 1137	229	0.391 3784	0.392 2256	446
8	0.235 0346	0.226 7969	1530	0.906 0021	0.907 8263	207	0.393 0449	0.393 8363	437
9	0.218 5428	0.210 2730	1545	0.909 5861	0.911 2814	185	0.394 5998	0.395 3353	428
10	0.201 9881	0.193 6888	1559	0.912 9121	0.914 4780	163	0.396 0427	0.396 7220	419
11	+0.185 3756	+0.177 0491	+1573	+0.915 9789	+0.917 4148	−141	+0.397 3730	+0.397 9957	−410
12	0.168 7100	0.160 3589	1587	0.918 7856	0.920 0912	118	0.398 5902	0.399 1564	400
13	0.151 9964	0.143 6232	1601	0.921 3316	0.922 5065	95	0.399 6943	0.400 2038	390
14	0.135 2399	0.126 8471	1614	0.923 6162	0.924 6601	71	0.400 6848	0.401 1373	380
15	0.118 4455	0.110 0356	1627	0.925 6384	0.926 5511	47	0.401 5614	0.401 9570	370
16	+0.101 6182	+0.093 1938	+1639	+0.927 3982	+0.928 1796	− 23	+0.402 3241	+0.402 6627	−360
17	0.084 7631	0.076 3267	1651	0.928 8953	0.929 5452	+ 1	0.402 9728	0.403 2544	349
18	0.067 8853	0.059 4395	1663	0.930 1294	0.930 6477	25	0.403 5074	0.403 7319	338
19	0.050 9899	0.042 5371	1674	0.931 1003	0.931 4871	50	0.403 9279	0.404 0954	327
20	0.034 0816	0.025 6241	1685	0.931 8082	0.932 0636	75	0.404 2344	0.404 3449	316
21	+0.017 1653	+0.008 7057	+1695	+0.932 2533	+0.932 3774	+101	+0.404 4269	+0.404 4804	−305
22	+0.000 2460	−0.008 2134	1705	0.932 4358	0.932 4287	127	0.404 5056	0.404 5024	294
23	−0.016 6718	0.025 1286	1714	0.932 3561	0.932 2181	153	0.404 4709	0.404 4110	282
24	0.033 5837	0.042 0358	1722	0.932 0147	0.931 7460	179	0.404 3228	0.404 2063	270
25	0.050 4848	0.058 9300	1730	0.931 4120	0.931 0128	206	0.404 0615	0.403 8885	258
26	−0.067 3710	−0.075 8072	+1738	+0.930 5484	+0.930 0190	+233	+0.403 6872	+0.403 4578	−246
27	0.084 2381	0.092 6632	1745	0.929 4245	0.928 7649	260	0.403 2001	0.402 9142	234
28	0.101 0819	0.109 4936	1752	0.928 0403	0.927 2507	287	0.402 6002	0.402 2580	222
29	0.117 8978	0.126 2940	1758	0.926 3962	0.925 4768	314	0.401 8877	0.401 4892	209
30	0.134 6816	0.143 0600	1764	0.924 4925	0.923 4434	342	0.401 0625	0.400 6077	197
July 1	−0.151 4288	−0.159 7873	+1769	+0.922 3895	+0.921 1508	+370	+0.400 1248	+0.399 6138	−184
2	−0.168 1350	−0.176 4712	+1773	+0.919 9075	+0.918 5994	+398	+0.399 0747	+0.398 5075	−171

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Re
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*N*
July 1	−0.151 4288	−0.159 7873	+1769	+0.922 3295	+0.921 1508	+ 370	+0.400 1248	+0.399 6138	−1
2	0.168 1350	0.176 4712	1773	0.919 9075	0.918 5994	398	0.399 0747	0.398 5075	1
3	0.184 7954	0.193 1070	1777	0.917 2266	0.915 7893	426	0.397 9123	0.397 2890	1
4	0.201 4054	0.209 6900	1780	0.914 2875	0.912 7213	454	0.396 6377	0.395 9585	1
5	0.217 9602	0.226 2154	1783	0.911 0908	0.909 3959	482	0.395 2513	0.394 5162	1
6	−0.234 4550	−0.242 6783	+1785	+0.907 6369	+0.905 8137	+ 511	+0.393 7532	+0.392 9624	−1
7	0.250 8849	0.259 0740	1786	0.903 9266	0.901 9756	540	0.392 1437	0.391 2973	1
8	0.267 2451	0.275 3975	1787	0.899 9609	0.897 8826	569	0.390 4232	0.389 5215	
9	0.283 5307	0.291 6440	1787	0.895 7408	0.893 5356	598	0.388 5922	0.387 6354	
10	0.299 7368	0.307 8083	1787	0.891 2672	0.888 9357	627	0.386 6511	0.385 6395	
11	−0.315 8587	−0.323 8865	+1786	+0.886 5412	+0.884 0840	+ 656	+0.384 6005	+0.383 5342	−
12	0.331 8915	0.339 8730	1784	0.881 5642	0.878 9820	685	0.382 4408	0.381 3202	
13	0.347 8303	0.355 7629	1782	0.876 3376	0.873 6312	714	0.380 1727	0.378 9983	
14	0.363 6702	0.371 5516	1779	0.870 8630	0.868 0333	744	0.377 7971	0.376 5691	−
15	0.379 4065	0.387 2344	1775	0.865 1422	0.862 1900	773	0.375 3145	0.374 0334	+
16	−0.395 0346	−0.402 8066	+1771	+0.859 1768	+0.856 1030	+ 803	+0.372 7259	+0.371 3921	+
17	0.410 5499	0.418 2638	1766	0.852 9687	0.849 7743	832	0.370 0321	0.368 6461	
18	0.425 9477	0.433 6012	1761	0.846 5201	0.843 2062	862	0.367 2341	0.365 7963	
19	0.441 2237	0.448 8148	1755	0.839 8330	0.836 4007	891	0.364 3328	0.362 8436	
20	0.456 3739	0.463 9004	1748	0.832 9096	0.829 3600	921	0.361 3290	0.359 7890	
21	−0.471 3939	−0.478 8538	+1740	+0.825 7521	+0.822 0863	+ 950	+0.358 2239	+0.356 6337	+1
22	0.486 2796	0.493 6710	1732	0.818 3628	0.814 5819	979	0.355 0185	0.353 3785	1
23	0.501 0274	0.508 3484	1723	0.810 7439	0.806 8491	1008	0.351 7137	0.350 0243	1
24	0.515 6334	0.522 8820	1714	0.802 8978	0.798 8902	1037	0.348 3104	0.346 5721	1
25	0.530 0938	0.537 2683	1704	0.794 8267	0.790 7074	1066	0.344 8096	0.343 0230	1
26	−0.544 4051	−0.551 5037	+1693	+0.786 5327	+0.782 3027	+1095	+0.341 2123	+0.339 3776	+1
27	0.558 5636	0.565 5843	1681	0.778 0178	0.773 6782	1124	0.337 5191	0.335 6369	1
28	0.572 5654	0.579 5064	1669	0.769 2842	0.764 8360	1153	0.333 7311	0.331 8018	2
29	0.586 4069	0.593 2663	1656	0.760 3339	0.755 7782	1181	0.329 8490	0.327 8730	2
30	0.600 0842	0.606 8601	1642	0.751 1692	0.746 5071	1209	0.325 8738	0.323 8516	2
31	−0.613 5934	−0.620 2837	+1628	+0.741 7921	+0.737 0245	+1237	+0.321 8064	+0.319 7384	+252
Aug. 1	0.626 9305	0.633 5333	1613	0.732 2047	0.727 3330	1265	0.317 6476	0.315 5343	268
2	0.640 0916	0.646 6048	1597	0.722 4096	0.717 4349	1293	0.313 3986	0.311 2406	283
3	0.653 0727	0.659 4945	1581	0.712 4092	0.707 3328	1320	0.309 0604	0.306 8582	298
4	0.665 8698	0.672 1981	1564	0.702 2060	0.697 0292	1347	0.304 6341	0.302 3882	314
5	−0.678 4789	−0.684 7117	+1546	+0.691 8027	+0.686 5269	+1374	+0.300 1208	+0.297 8319	+329
6	0.690 8961	0.697 0316	1528	0.681 2021	0.675 8287	1401	0.295 5218	0.293 1905	344
7	0.703 1177	0.709 1538	1509	0.670 4071	0.664 9376	1427	0.290 8383	0.288 4652	359
8	0.715 1396	0.721 0745	1490	0.659 4205	0.653 8563	1453	0.286 0715	0.283 6573	374
9	0.726 9580	0.732 7897	1470	0.648 2453	0.642 5880	1479	0.281 2228	0.278 7683	389
10	−0.738 5691	−0.744 2958	+1449	+0.636 8848	+0.631 1361	+1504	+0.276 2938	+0.273 7995	+404
11	0.749 9693	0.755 5893	1428	0.625 3423	0.619 5038	1529	0.271 2857	0.268 7524	419
12	0.761 1552	0.766 6666	1406	0.613 6211	0.607 6946	1554	0.266 2000	0.263 6287	434
13	0.772 1230	0.777 5240	1383	0.601 7247	0.595 7120	1579	0.261 0386	0.258 4299	449
14	0.782 8692	0.788 1583	1360	0.589 6569	0.583 5598	1603	0.255 8029	0.253 1576	464
15	−0.793 3908	−0.798 5665	+1336	+0.577 4213	+0.571 2417	+1627	+0.250 4944	+0.247 8134	+479
16	−0.803 6850	−0.808 7457	+1311	+0.565 0216	+0.558 7615	+1650	+0.245 1149	+0.242 3990	+494

FOR GREENWICH MEAN NOON AND MIDNIGHT.

ate.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. o.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
g.16	−0.803 6850	−0.808 7457	+1311	+0.565 0216	+0.558 7615	+1650	+0.245 1149	+0.242 3990	+494
17	0.813 7485	0.818 6929	1286	0.552 4617	0.546 1228	1673	0.239 6660	0.236 9161	508
18	0.823 5787	0.828 4055	1260	0.539 7452	0.533 3295	1696	0.234 1495	0.231 3663	522
19	0.833 1730	0.837 8808	1234	0.526 8760	0.520 3852	1718	0.228 5668	0.225 7512	537
20	0.842 5287	0.847 1164	1207	0.513 8577	0.507 2939	1739	0.222 9197	0.220 0725	551
21	−0.851 6436	−0.856 1101	+1180	+0.500 6943	+0.494 0593	+1760	+0.217 2097	+0.214 3316	+565
22	0.860 5155	0.864 8596	1152	0.487 3893	0.480 6848	1781	0.211 4384	0.208 5302	579
23	0.869 1421	0.873 3627	1123	0.473 9462	0.467 1740	1801	0.205 6073	0.202 6697	593
24	0.877 5210	0.881 6168	1094	0.460 3687	0.453 5306	1821	0.199 7178	0.196 7517	607
25	0.885 6498	0.889 6197	1064	0.446 6603	0.439 7581	1840	0.193 7715	0.190 7775	621
26	−0.893 5263	−0.897 3692	+1034	+0.432 8244	+0.425 8598	+1859	+0.187 7699	+0.184 7488	+635
27	0.901 1481	0.904 8628	1003	0.418 8646	0.411 8394	1877	0.181 7145	0.178 6670	648
28	0.908 5129	0.912 0982	972	0.404 7845	0.397 7004	1895	0.175 6066	0.172 5335	661
29	0.915 6183	0.919 0729	940	0.390 5877	0.383 4467	1912	0.169 4480	0.166 3502	674
30	0.922 4618	0.925 7847	908	0.376 2780	0.369 0820	1929	0.163 2404	0.160 1186	687
31	−0.929 0412	−0.932 2310	+ 875	+0.361 8591	+0.354 6099	+1945	+0.156 9852	+0.153 8403	+700
pt. 1	0.935 3539	0.938 4096	842	0.347 3350	0.340 0348	1961	0.150 6842	0.147 5171	712
2	0.941 3978	0.944 3183	809	0.332 7098	0.325 3605	1976	0.144 3392	0.141 1507	724
3	0.947 1707	0.949 9548	775	0.317 9874	0.310 5910	1991	0.137 9518	0.134 7428	736
4	0.952 6704	0.955 3172	741	0.303 1719	0.295 7306	2005	0.131 5239	0.128 2954	748
5	−0.957 8949	−0.960 4033	+ 706	+0.288 2676	+0.280 7835	+2019	+0.125 0576	+0.121 8105	+760
6	0.962 8421	0.965 2111	671	0.273 2789	0.265 7542	2032	0.118 5545	0.115 2898	772
7	0.967 5100	0.969 7387	636	0.258 2100	0.250 6469	2044	0.112 0166	0.108 7352	783
8	0.971 8969	0.973 9844	600	0.243 0654	0.235 4661	2056	0.105 4458	0.102 1487	794
9	0.976 0009	0.977 9464	564	0.227 8496	0.220 2166	2067	0.098 8442	0.095 5326	805
10	−0.979 8205	−0.981 6232	+ 527	+0.212 5676	+0.204 9032	+2078	+0.092 2140	+0.088 8888	+816
11	0.983 3544	0.985 0137	490	0.197 2239	0.189 5304	2088	0.085 5572	0.082 2194	827
12	0.986 6012	0.988 1167	453	0.181 8233	0.174 1032	2097	0.078 8758	0.075 5265	837
13	0.989 5600	0.990 9311	416	0.166 3707	0.158 6264	2106	0.072 1718	0.068 8121	847
14	0.992 2299	0.993 4563	378	0.150 8708	0.143 1046	2114	0.065 4476	0.062 0786	857
15	−0.994 6102	−0.995 6916	+ 340	+0.135 3283	+0.127 5425	+2121	+0.058 7052	+0.055 3277	+867
16	0.996 7004	0.997 6366	302	0.119 7478	0.111 9447	2128	0.051 9464	0.048 5615	876
17	0.998 5002	0.999 2910	263	0.104 1339	0.096 3159	2134	0.045 1731	0.041 7818	885
18	1.000 0091	1.000 6543	224	0.088 4913	0.080 6606	2140	0.038 3878	0.034 9910	894
19	1.001 2267	1.001 7262	185	0.072 8243	0.064 9830	2145	0.031 5918	0.028 1905	902
20	−1.002 1529	−1.002 5066	+ 146	+0.057 1372	+0.049 2875	+2149	+0.024 7872	+0.021 3822	+910
21	1.002 7874	1.002 9953	106	0.041 4345	0.033 5786	2153	0.017 9757	0.014 5680	918
22	1.003 1302	1.003 1921	66	0.025 7204	0.017 8604	2156	0.011 1592	0.007 7496	926
23	1.003 1809	1.003 0969	+ 26	+0.009 9991	+0.002 1370	2158	+0.004 3395	+0.000 9290	933
24	1.002 9391	1.002 7084	− 14	−0.005 7252	−0.013 5871	2160	−0.002 4816	−0.005 8920	940
25	−1.002 4046	−1.002 0276	− 54	−0.021 4481	−0.029 3076	+2161	−0.009 3021	−0.012 7116	+947
26	1.001 5774	1.001 0539	95	0.037 1652	0.045 0203	2162	0.016 1203	0.019 5279	954
27	1.000 4572	0.999 7872	136	0.052 8723	0.060 7206	2162	0.022 9343	0.026 3391	960
28	0.999 0438	0.998 2271	177	0.068 5648	0.076 4042	2161	0.029 7422	0.033 1432	966
29	0.997 3370	0.996 3735	218	0.084 2383	0.092 0665	2160	0.036 5420	0.039 9382	972
30	−0.995 3367	−0.994 2265	− 259	−0.099 8883	−0.107 7029	+2158	−0.043 3316	−0.046 7220	+977
Oct. 1	−0.993 0430	−0.991 7862	− 300	−0.115 5099	−0.123 3087	+2155	−0.050 1091	−0.053 4927	+982

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Date.	X True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. o.	Z True Equinox.		Redu to Mea Eq'x Jan.
	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noon.	Noon.	Midnight.	Noo
Oct. 1	−0.993 0430	−0.991 7862	− 300	−0.115 5099	−0.123 3087	+2155	−0.050 1091	−0.053 4927	+ 9
2	0.990 4562	0.989 0530	342	0.131 0988	0.138 8796	2152	0.056 8725	0.060 2482	987
3	0.987 5765	0.986 0269	383	0.146 6504	0.154 4107	2148	0.063 6197	0.066 9866	99
4	0.984 4041	0.982 7082	424	0.162 1599	0.169 8972	2143	0.070 3487	0.073 7057	99
5	0.980 9393	0.979 0975	465	0.177 6225	0.185 3346	2138	0.077 0574	0.080 4035	100
6	−0.977 1828	−0.975 1953	− 507	−0.193 0332	−0.200 7176	+2132	−0.083 7436	−0.087 0775	+100
7	0.973 1352	0.971 0025	549	0.208 3873	0.216 0416	2126	0.090 4050	0.093 7258	1007
8	0.968 7973	0.966 5198	590	0.223 6798	0.231 3014	2119	0.097 0396	0.100 3462	1010
9	0.964 1702	0.961 7485	632	0.238 9057	0.246 4922	2111	0.103 6452	0.106 9364	1012
10	0.959 2550	0.956 6898	674	0.254 0601	0.261 6089	2103	0.110 2196	0.113 4945	1014
11	−0.954 0531	−0.951 3452	− 716	−0.269 1379	−0.276 6465	+2094	−0.116 7607	−0.120 0180	+1016
12	0.948 5662	0.945 7164	757	0.284 1342	0.291 6004	2085	0.123 2662	0.126 5050	1018
13	0.942 7961	0.939 8054	799	0.299 0446	0.306 4661	2075	0.129 7343	0.132 9537	1019
14	0.936 7446	0.933 6139	841	0.313 8644	0.321 2387	2064	0.136 1629	0.139 3617	1020
15	0.930 4137	0.927 1442	882	0.328 5889	0.335 9140	2053	0.142 5500	0.145 7275	1021
16	−0.923 8056	−0.920 3983	− 923	−0.343 2138	−0.350 4875	+2041	−0.148 8939	−0.152 0490	+1022
17	0.916 9225	0.913 3785	964	0.357 7347	0.364 9549	2028	0.155 1926	0.158 3245	1021
18	0.909 7664	0.906 0866	1005	0.372 1476	0.379 3123	2015	0.161 4444	0.164 5522	1020
19	0.902 3392	0.898 5246	1046	0.386 4484	0.393 5554	2001	0.167 6476	0.170 7304	1019
20	0.894 6431	0.890 6949	1087	0.400 6329	0.407 6802	1987	0.173 8005	0.176 8575	1018
21	−0.886 6804	−0.882 5997	−1128	−0.414 6970	−0.421 6827	+1972	−0.179 9013	−0.182 9316	+1016
22	0.878 4532	0.874 2411	1169	0.428 6369	0.435 5590	1956	0.185 9483	0.188 9511	1014
23	0.869 9634	0.865 6208	1210	0.442 4485	0.449 3050	1940	0.191 9398	0.194 9142	1012
24	0.861 2133	0.856 7413	1250	0.456 1279	0.462 9167	1923	0.197 8741	0.200 8192	1009
25	0.852 2051	0.847 6049	1290	0.469 6710	0.476 3902	1905	0.203 7494	0.206 6643	1006
26	−0.842 9410	−0.838 2137	−1330	−0.483 0738	−0.489 7213	+1887	−0.209 5638	−0.212 4477	+1002
27	0.833 4233	0.828 5701	1370	0.496 3322	0.502 9060	1868	0.215 3158	0.218 1678	998
28	0.823 6544	0.818 6765	1410	0.509 4421	0.515 9401	1848	0.221 0035	0.223 8226	994
29	0.813 6367	0.808 5353	1450	0.522 3995	0.528 8198	1828	0.226 6250	0.229 4105	989
30	0.803 3727	0.798 1493	1489	0.535 2004	0.541 5409	1807	0.232 1788	0.234 9297	984
31	−0.792 8651	−0.787 5208	−1528	−0.547 8407	−0.554 0993	+1786	−0.237 6630	−0.240 3784	+ 979
Nov. 1	0.782 1167	0.776 6530	1567	0.560 3163	0.566 4911	1764	0.243 0758	0.245 7548	974
2	0.771 1301	0.765 5485	1606	0.572 6232	0.578 7121	1741	0.248 4153	0.251 0570	968
3	0.759 9084	0.754 2103	1644	0.584 7572	0.590 7580	1718	0.253 6797	0.256 2831	962
4	0.748 4545	0.742 6415	1682	0.596 7140	0.602 6247	1694	0.258 8671	0.261 4314	955
5	−0.736 7716	−0.730 8453	−1720	−0.608 4897	−0.614 3084	+1670	−0.263 9758	−0.266 5002	+ 948
6	0.724 8632	0.718 8257	1757	0.620 0802	0.625 8047	1645	0.269 0040	0.271 4874	941
7	0.712 7332	0.706 5861	1794	0.631 4814	0.637 1098	1620	0.273 9500	0.276 3916	933
8	0.700 3850	0.694 1303	1831	0.642 6894	0.648 2198	1594	0.278 8120	0.281 2110	925
9	0.687 8225	0.681 4622	1868	0.653 7004	0.659 1308	1567	0.283 5883	0.285 9438	916
10	−0.675 0500	−0.668 5863	−1904	−0.664 5105	−0.669 8391	+1540	−0.288 2774	−0.290 5887	+ 907
11	0.662 0718	0.655 5069	1940	0.675 1163	0.680 3416	1512	0.292 8777	0.295 1441	898
12	0.648 8922	0.642 2281	1975	0.685 5147	0.690 6351	1484	0.297 3879	0.299 6088	888
13	0.635 5152	0.628 7541	2010	0.695 7025	0.700 7164	1455	0.301 8067	0.303 9814	878
14	0.621 9453	0.615 0893	2045	0.705 6766	0.710 5826	1426	0.306 1328	0.308 2607	868
15	−0.608 1867	−0.601 2360	−2079	−0.715 4341	−0.720 2308	+1396	−0.310 3650	−0.312 4455	+ 857
16	−0.594 2436	−0.587 2041	−2113	−0.724 9722	−0.729 6580	+1365	−0.314 5021	−0.316 5346	+ 846

FOR GREENWICH MEAN NOON AND MIDNIGHT.

ate.	X True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Y True Equinox.		Reduc. to Mean Eq'x of Jan. 0.	Z True Equinox.		Reduc. to Mean Eq'x of Jan. 0.
	Noon.	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*	*Noon.*	*Midnight.*	*Noon.*
v.16	−0.594 2436	−0.587 2041	−2113	−0.724 9722	−0.729 6580	+1365	−0.314 5021	−0.316 5346	+846
17	0.580 1201	0.572 9920	2146	0.734 2880	0.738 8618	1334	0.318 5429	0.320 5268	835
18	0.565 8205	0.558 6060	2179	0.743 3790	0.747 8394	1302	0.322 4862	0.324 4210	823
19	0.551 3490	0.544 0500	2212	0.752 2426	0.756 5883	1270	0.326 3310	0.328 2161	811
20	0.536 7096	0.529 3283	2244	0.760 8761	0.765 1057	1237	0.330 0762	0.331 9111	799
21	−0.521 9065	−0.514 4448	−2276	−0.769 2769	−0.773 3893	+1204	−0.333 7206	−0.335 5047	+786
22	0.506 9438	0.499 4040	2307	0.777 4426	0.781 4365	1170	0.337 2631	0.338 9958	773
23	0.491 8260	0.484 2102	2338	0.785 3706	0.789 2446	1136	0.340 7026	0.342 3834	760
24	0.476 5573	0.468 8677	2368	0.793 0583	0.796 8113	1101	0.344 0380	0.345 6664	746
25	0.461 1419	0.453 3806	2398	0.800 5034	0.804 1342	1065	0.347 2683	0.348 8436	732
26	−0.445 5843	−0.437 7535	−2427	−0.807 7034	−0.811 2107	+1029	−0.350 3922	−0.351 9139	+717
27	0.429 8888	0.421 9906	2455	0.814 6558	0.818 0384	992	0.353 4087	0.354 8764	702
28	0.414 0597	0.406 0966	2483	0.821 3582	0.824 6149	955	0.356 3169	0.357 7300	687
29	0.398 1019	0.390 0762	2510	0.827 8083	0.830 9380	917	0.359 1156	0.360 4735	672
30	0.382 0200	0.373 9339	2537	0.834 0038	0.837 0054	878	0.361 8037	0.363 1060	657
c. 1	−0.365 8186	−0.357 6746	−2563	−0.839 9424	−0.842 8146	+ 839	−0.364 3803	−0.365 6264	+641
2	0.349 5025	0.341 3030	2588	0.845 6218	0.848 3636	799	0.366 8443	0.368 0338	625
3	0.333 0768	0.324 8244	2613	0.851 0397	0.853 6499	759	0.369 1947	0.370 3270	609
4	0.316 5465	0.308 2438	2637	0.856 1939	0.858 6714	719	0.371 4306	0.372 5053	592
5	0.299 9169	0.291 5666	2661	0.861 0823	0.863 4262	678	0.373 5511	0.374 5677	575
6	−0.283 1936	−0.274 7985	−2684	−0.865 7030	−0.867 9124	+ 637	−0.375 5552	−0.376 5134	+557
7	0.266 3820	0.257 9448	2706	0.870 0543	0.872 1285	595	0.377 4423	0.378 3418	539
8	0.249 4877	0.241 0113	2727	0.874 1347	0.876 0728	553	0.379 2118	0.380 0522	521
9	0.232 5163	0.224 0036	2748	0.877 9427	0.879 7442	510	0.380 8630	0.381 6441	503
10	0.215 4737	0.206 9275	2768	0.881 4772	0.883 1416	467	0.382 3955	0.383 1171	485
11	−0.198 3655	−0.189 7885	−2787	−0.884 7372	−0.886 2640	+ 423	−0.383 8089	−0.384 4708	+466
12	0.181 1971	0.172 5921	2805	0.887 7219	0.889 1108	379	0.385 1029	0.385 7050	447
13	0.163 9741	0.155 3438	2823	0.890 4306	0.891 6813	335	0.386 2772	0.386 8195	428
14	0.146 7018	0.138 0489	2840	0.892 8627	0.893 9749	290	0.387 3318	0.387 8141	409
15	0.129 3856	0.120 7127	2856	0.895 0177	0.895 9912	245	0.388 2663	0.388 6884	389
16	−0.112 0307	−0.103 3404	−2872	−0.896 8952	−0.897 7298	+ 199	−0.389 0804	−0.389 4424	+369
17	0.094 6424	0.085 9373	2886	0.898 4948	0.899 1902	153	0.389 7742	0.390 0759	349
18	0.077 2258	0.068 5085	2899	0.899 8161	0.900 3723	107	0.390 3474	0.390 5888	329
19	0.059 7861	0.051 0592	2912	0.900 8589	0.901 2758	60	0.390 7999	0.390 9809	309
20	0.042 3285	0.033 5945	2924	0.901 6229	0.901 9002	+ 13	0.391 1316	0.391 2521	288
21	−0.024 8580	−0.016 1196	−2935	−0.902 1078	−0.902 2456	− 34	−0.391 3423	−0.391 4023	+267
22	−0.007 3799	+0.001 3604	2945	0.902 3136	0.902 3117	82	0.391 4321	0.391 4316	246
23	+0.010 1006	0.018 8402	2954	0.902 2400	0.902 0984	130	0.391 4008	0.391 3396	225
24	0.027 5786	0.036 3151	2962	0.901 8869	0.901 6056	178	0.391 2482	0.391 1265	204
25	0.045 0490	0.053 7797	2969	0.901 2544	0.900 8334	227	0.390 9745	0.390 7922	182
26	+0.062 5065	+0.071 2287	−2976	−0.900 3425	−0.899 7818	− 276	−0.390 5795	−0.390 3366	+160
27	0.079 9457	0.088 6568	2981	0.899 1512	0.898 4508	325	0.390 0633	0.389 7597	138
28	0.097 3615	0.106 0590	2985	0.897 6807	0.896 8407	374	0.389 4258	0.389 0616	116
29	0.114 7487	0.123 4298	2988	0.895 9310	0.894 9515	423	0.388 6671	0.388 2423	94
30	0.132 1018	0.140 7639	2991	0.893 9023	0.892 7834	473	0.387 7872	0.387 3019	72
31	+0.149 4154	+0.158 0557	−2993	−0.891 5948	−0.890 3366	− 523	−0.386 7863	−0.386 2405	+ 49
32	+0.166 6840	+0.175 2997	−2994	−0.889 0088	−0.887 6115	− 573	−0.385 6644	−0.385 0581	+ 27

MOON'S LONGITUDE AND LATITUDE, 1915.

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JANUARY.		Day of Month.	FEBRUARY.		Day of Month.	MARCH.	
	True Long.	Latitude.		True Long.	Latitude.		True Long.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′
1.0	99 50 20.7	+3 46 41.2	1.0	147 39 5.3	−0 6 27.7	1.0	156 18 9.3	−0 53
1.5	106 7 18.0	3 22 39.9	1.5	154 25 43.9	0 43 47.7	1.5	163 17 26.9	1 31
2.0	112 27 0.0	2 55 56.4	2.0	161 15 26.6	1 20 47.9	2.0	170 20 54.3	2 7
2.5	118 49 27.3	2 26 46.9	2.5	168 7 58.1	1 56 53.6	2.5	177 27 58.7	2 42
3.0	125 14 40.3	1 55 30.6	3.0	175 3 2.4	2 31 30.2	3.0	184 38 2.7	3 15
3.5	131 42 40.1	+1 22 29.0	3.5	182 0 23.2	−3 4 4.0	3.5	191 50 25.4	−3 44
4.0	138 13 28.6	0 48 5.9	4.0	188 59 44.4	3 34 2.5	4.0	199 4 24.1	4 10
4.5	144 47 8.5	+0 12 47.0	4.5	196 0 50.0	4 0 55.6	4.5	206 19 15.5	4 32
5.0	151 23 43.7	−0 23 0.2	5.0	203 3 24.3	4 24 16.3	5.0	213 34 17.4	4 50
5.5	158 3 19.4	0 58 46.7	5.5	210 7 11.7	4 43 40.8	5.5	220 48 49.9	5 3
6.0	164 46 1.7	−1 34 2.6	6.0	217 11 56.8	−4 58 49.1	6.0	228 2 16.3	−5 11
6.5	171 31 56.9	2 8 17.5	6.5	224 17 24.0	5 9 25.9	6.5	235 14 4.4	5 15
7.0	178 21 11.1	2 41 0.5	7.0	231 23 17.4	5 15 20.3	7.0	242 23 46.8	5 13
7.5	185 13 49.5	3 11 40.7	7.5	238 29 20.3	5 16 26.3	7.5	249 31 1.0	5 6
8.0	192 9 55.6	3 39 48.0	8.0	245 35 15.2	5 12 42.6	8.0	256 35 29.4	4 55
8.5	199 9 30.0	−4 4 53.1	8.5	252 40 43.5	−5 4 13.2	8.5	263 36 59.1	−4 40
9.0	206 12 29.2	4 26 28.4	9.0	259 45 25.7	4 51 7.2	9.0	270 35 21.3	4 20
9.5	213 18 45.2	4 44 8.7	9.5	266 49 1.3	4 33 38.4	9.5	277 30 30.7	3 57
10.0	220 28 4.2	4 57 31.9	10.6	273 51 8.6	4 12 5.2	10.0	284 22 24.7	3 31
10.5	227 40 5.9	5 6 19.5	10.5	280 51 25.3	3 46 50.4	10.5	291 11 2.7	3 1
11.0	234 54 23.7	−5 10 17.9	11.0	287 49 29.1	−3 18 20.6	11.0	297 56 25.7	−2 30
11.5	242 10 24.2	5 9 18.8	11.5	294 44 57.8	2 47 5.5	11.5	304 38 35.4	1 57
12.0	249 27 28.0	5 3 20.3	12.0	301 37 30.1	2 13 37.0	12.0	311 17 34.0	1 22
12.5	256 44 50.6	4 52 26.8	12.5	308 26 46.0	1 38 28.7	12.5	317 53 23.6	0 46
13.0	264 1 43.6	4 36 49.6	13.0	315 12 27.7	1 2 14.8	13.0	324 26 5.9	−0 11
13.5	271 17 16.7	−4 16 46.8	13.5	321 54 20.1	−0 25 29.1	13.5	330 55 42.7	+0 24
14.0	278 30 39.6	3 52 42.2	14.0	328 32 11.0	+0 11 15.7	14.0	337 22 15.4	0 59
14.5	285 41 4.0	3 25 4.9	14.5	335 5 51.9	0 47 28.6	14.5	343 45 45.6	1 33
15.0	292 47 45.1	2 54 28.1	15.0	341 35 18.2	1 22 40.9	15.0	350 6 15.2	2 6
15.5	299 50 3.7	2 21 27.6	15.5	348 0 29.4	1 56 26.8	15.5	356 23 46.5	2 36
16.0	306 47 27.3	−1 46 40.6	16.0	354 21 29.2	+2 28 23.4	16.0	2 38 22.8	+3 5
16.5	313 39 31.0	1 10 44.2	16.5	0 38 25.4	2 58 10.9	16.5	8 50 8.9	3 31
17.0	320 25 57.8	−0 34 14.3	17.0	6 51 30.1	3 25 32.4	17.0	14 59 11.3	3 54
17.5	327 6 39.0	+0 2 15.2	17.5	13 0 59.3	3 50 13.9	17.5	21 5 38.2	4 15
18.0	333 41 33.6	0 38 13.3	18.0	19 7 12.3	4 12 4.1	18.0	27 9 40.4	4 32
18.5	340 10 48.1	+1 13 12.2	18.5	25 10 31.9	+4 30 54.1	18.5	33 11 31.2	+4 46
19.0	346 34 35.6	1 46 47.5	19.0	31 11 24.1	4 46 36.7	19.0	39 11 26.6	4 58
19.5	352 53 15.1	2 18 38.1	19.5	37 10 17.6	4 59 6.5	19.5	45 9 45.2	5 5
20.0	359 7 10.5	2 48 25.9	20.0	43 7 43.1	5 8 19.5	20.0	51 6 48.5	5 10
20.5	5 16 49.9	3 15 55.8	20.5	49 4 13.0	5 14 12.9	20.5	57 3 0.7	5 11
21.0	11 22 44.5	+3 40 55.0	21.0	55 0 21.3	+5 16 44.6	21.0	62 58 48.9	+5 9
21.5	17 25 28.2	4 3 12.9	21.5	60 56 43.0	5 15 53.5	21.5	68 54 42.3	5 3
22.0	23 25 36.4	4 22 40.6	22.0	66 53 53.7	5 11 39.2	22.0	74 51 12.4	4 54
22.5	29 23 45.7	4 39 10.6	22.5	72 52 28.8	5 4 2.0	22.5	80 48 52 7	4 42
23.0	35 20 33.1	4 52 36.5	23.0	78 53 3.4	4 53 3.2	23.0	86 48 18.2	4 27
23.5	41 16 35.5	+5 2 52.7	23.5	84 56 11.8	+4 38 44.9	23.5	92 50 5.1	+4 9
24.0	47 12 29.1	5 9 54.4	24.0	91 2 26.9	4 21 19.8	24.0	98 54 50.0	3 47
24.5	53 8 49.2	5 13 37.7	24.5	97 12 19.3	4 0 26.0	24.5	105 3 9.5	3 23
25.0	59 6 9.4	5 13 59.4	25.0	103 26 17.1	[illegible] 36 37.5	25.0	111 15 39.6	2 57
25.5	65 5 1.5	5 10 56.9	25.5	109 44 45.0	3 9 54.8	25.5	117 32 54.8	2 28
26.0	71 5 55.0	+5 4 28.7	26.0	116 8 3.9	+2 40 30.4	26.0	123 55 27.1	+1 56 44.1
26.5	77 9 16.5	4 54 34.6	26.5	122 36 29.8	2 8 39.7	26.5	130 23 44.8	1 23 25.7
27.0	83 15 29.7	4 41 15.8	27.0	129 10 13.8	1 34 42.0	27.0	136 58 11.9	0 48 31.0
27.5	89 24 54.9	4 24 35.3	27.5	135 49 20.0	0 59 0.3	27.5	143 39 6.3	+0 12 24.1
28.0	95 37 48.7	4 4 38.3	28.0	142 33 47.9	+0 22 1.3	28.0	150 26 38.5	−0 24 26.9
28.5	101 54 24.2	+3 41 32.5	28.5	149 23 29.2	−0 15 44.3	28.5	157 20 50.7	−1 1 30.3
29.0	108 14 50.7	3 15 28.7	29.0	156 18 9.3	0 53 42.5	29.0	164 21 35.5	1 38 10.8
29.5	114 39 13.4	2 46 40.6	29.5	163 17 26.9	1 31 16.6	29.5	171 28 35.1	2 13 49.9
30.0	121 7 33.9	2 15 25.3	30.0	170 20 54.3	2 7 48.1	30.0	178 41 21.0	2 47 47.2
30.5	127 39 50.1	1 42 3.4	30.5	177 27 58.7	2 42 38.0	30.5	185 59 13.9	3 19 22.1
31.0	134 15 56.6	+1 6 58.8	31.0	184 38 2.7	−3 15 7.9	31.0	193 21 24.7	−3 47 54.7
31.5	140 55 45.2	+0 30 38.5	31.5	191 50 25.4	−3 44 41.3	31.5	200 46 55.7	−4 12 47.8

FOR GREENWICH MEAN NOON AND MIDNIGHT.

of th.	APRIL.		Day of Month.	MAY.		Day of Month.	JUNE.	
	True Long.	Latitude.		True Long.	Latitude.		True Long.	Latitude.
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′ ″
.0	208 14 42.7	−4 33 28.9	1.0	247 12 22.5	−4 52 3.0	1.0	300 6 20.6	−1 42 54.3
.5	215 43 37.6	4 49 31.7	1.5	254 44 54.7	4 39 55.2	1.5	307 8 7.1	1 7 8.0
.0	223 12 31.5	5 0 36.9	2.0	262 13 3.3	4 23 5.5	2.0	314 2 37.6	−0 30 56.7
.5	230 40 17.5	5 6 33.2	2.5	269 35 53.5	4 2 1.8	2.5	320 49 59.8	+0 5 5.7
.0	238 5 53.1	5 7 17.8	3.0	276 52 43.8	3 37 16.4	3.0	327 30 29.8	0 40 28.8
.5	245 28 23.2	−5 2 55.5	3.5	284 3 6.4	−3 9 24.1	3.5	334 4 30.5	+1 14 45.9
.0	252 47 1.6	4 53 38.2	4.0	291 6 46.2	2 39 1.0	4.0	340 32 29.8	1 47 33.9
.5	260 1 12.0	4 39 43.9	4.5	298 3 39.7	2 6 42.9	4.5	346 54 58.9	2 18 32.8
.0	267 10 27.9	4 21 35.4	5.0	304 53 53.3	1 33 4.3	5.0	353 12 30.8	2 47 25.5
.5	274 14 32.9	3 59 38.9	5.5	311 37 41.6	0 58 37.9	5.5	359 25 39.6	3 13 57.5
.0	281 13 19.7	−3 34 23.1	6.0	318 15 25.3	−0 23 54.2	6.0	5 34 59.1	+3 37 56.5
.5	288 6 48.8	3 6 18.0	6.5	324 47 29.7	+0 10 38.8	6.5	11 41 2.4	3 59 12.1
.0	294 55 7.0	2 35 54.3	7.0	331 14 22.6	0 44 35.6	7.0	17 44 20.9	4 17 35.5
.5	301 38 26.4	2 3 42.5	7.5	337 36 33.6	1 17 33.0	7.5	23 45 24.0	4 32 59.2
.0	308 17 2.6	1 30 12.4	8.0	343 54 32.5	1 49 10.1	8.0	29 44 39.0	4 45 17.2
.5	314 51 13.7	−0 55 53.2	8.5	350 8 48.6	+2 19 8.0	8.5	35 42 30.8	+4 54 24.9
.0	321 21 18.8	−0 21 12.7	9.0	356 19 49.6	2 47 9.6	9.0	41 39 22.0	5 0 18.8
.5	327 47 37.5	+0 13 22.4	9.5	2 28 1.4	3 12 59.6	9.5	47 35 32.5	5 2 56.7
.0	334 10 28.7	0 47 26.8	10.0	8 33 47.9	3 36 24.4	10.0	53 31 20.1	5 2 17.9
.5	340 30 10.2	1 20 36.6	10.5	14 37 30.4	3 57 12.0	10.5	59 27 0.5	4 58 23.0
.0	346 46 58.5	+1 52 29.7	11.0	20 39 27.8	+4 15 12.0	11.0	65 22 47.8	+4 51 14.1
.5	353 1 8.1	2 22 45.5	11.5	26 39 56.7	4 30 15.5	11.5	71 18 54.8	4 40 55.0
.0	359 12 51.9	2 51 5.1	12.0	32 39 11.7	4 42 15.4	12.0	77 15 33.0	4 27 31.0
.5	5 22 21.2	3 17 11.5	12.5	38 37 25.5	4 51 6.1	12.5	83 12 53.7	4 11 9.1
.0	11 29 45.9	3 40 49.4	13.0	44 34 49.3	4 56 43.7	13.0	89 11 8.1	3 51 57.9
.5	17 35 14.8	+4 1 45.9	13.5	50 31 33.6	+4 59 6.0	13.5	95 10 27.5	+3 30 7.8
.0	23 38 56.1	4 19 49.9	14.0	56 27 48.3	4 58 12.5	14.0	101 11 4.2	3 5 50.7
.5	29 40 57.7	4 34 52.3	14.5	62 23 43.3	4 54 4.4	14.5	107 13 11.8	2 39 20.1
5.0	35 41 27.9	4 46 46.1	15.0	68 19 29.2	4 46 44.6	15.0	113 17 5.3	2 10 51.0
5.5	41 40 35.7	4 55 26.5	15.5	74 15 17.7	4 36 17.5	15.5	119 23 1.5	1 40 39.8
6.0	47 38 31.4	+5 0 50.3	16.0	80 11 21.7	+4 22 49.1	16.0	125 31 19.0	+1 9 4.4
6.5	53 35 26.9	5 2 56.2	16.5	86 7 56.2	4 6 26.7	16.5	131 42 18.5	0 36 24.0
7.0	59 31 36.0	5 1 44.6	17.0	92 5 18.4	3 47 19.1	17.0	137 56 22.5	+0 2 59.1
7.5	65 27 15.0	4 57 17.4	17.5	98 3 48.0	3 25 36.4	17.5	144 13 55.2	−0 30 48.4
8.0	71 22 42.7	4 49 37.8	18.0	104 3 47.3	3 1 29.7	18.0	150 35 22.1	1 4 35.5
8.5	77 18 20.8	+4 38 50.2	18.5	110 5 41.1	+2 35 11.5	18.5	157 1 9.3	−1 37 57.7
9.0	83 14 33.6	4 25 0.3	19.0	116 9 57.1	2 6 55.5	19.0	163 31 42.7	2 10 29.1
9.5	89 11 48.2	4 8 14.8	19.5	122 17 5.2	1 36 56.7	19.5	170 7 27.3	2 41 42.8
0.0	95 10 34.4	3 48 41.2	20.0	128 27 37.5	1 5 31.6	20.0	176 48 45.7	3 11 10.8
0.5	101 11 24.5	3 26 28.1	20.5	134 42 7.6	+0 32 58.0	20.5	183 35 57.2	3 38 23.8
1.0	107 14 52.9	+3 1 45.4	21.0	141 1 9.9	−0 0 24.4	21.0	190 29 15.9	−4 2 52.2
1.5	113 21 35.7	2 34 44.3	21.5	147 25 18.9	0 34 13.8	21.5	197 28 49.1	4 24 6.4
22.0	119 32 9.9	2 5 37.4	22.0	153 55 8.0	1 8 6.6	22.0	204 34 36.2	4 41 37.4
22.5	125 47 12.9	1 34 39.2	22.5	160 31 8.2	1 41 36.9	22.5	211 46 26.8	4 54 58.2
23.0	132 7 22.0	1 2 6.3	23.0	167 13 46.6	2 14 16.1	23.0	219 3 59.9	5 3 44.6
23.5	138 33 12.7	+0 28 17.6	23.5	174 3 25.0	−2 45 33.5	23.5	226 26 42.7	−5 7 36.8
24.0	145 5 17.7	−0 6 24.9	24.0	181 0 17.4	3 14 56.5	24.0	233 53 51.0	5 6 20.7
24.5	151 44 5.4	0 41 36.2	24.5	188 4 28.4	3 41 50.9	24.5	241 24 29.7	4 59 49.3
25.0	158 29 58.2	1 16 48.2	25.0	195 15 51.3	4 5 42.0	25.0	248 57 34.5	4 48 3.6
25.5	165 23 11.1	1 51 29.2	25.5	202 34 6.7	4 25 55.4	25.5	256 31 54.0	4 31 13.2
26.0	172 23 49.5	−2 25 4.6	26.0	209 58 40.9	−4 41 59.0	26.0	264 6 12.7	−4 9 36.6
26.5	179 31 47.2	2 56 57.1	26.5	217 28 46.5	4 53 24.4	26.5	271 39 14.3	3 43 40.4
27.0	186 46 45.4	3 26 27.9	27.0	225 3 22.5	4 59 48.8	27.0	279 9 45.0	3 13 58.3
27.5	194 8 12.1	3 52 58.1	27.5	232 41 15.8	5 0 56.5	27.5	286 36 36.9	2 41 9.3
28.0	201 35 21.2	4 15 50.0	28.0	240 21 4.6	4 56 40.6	28.0	293 58 50.1	2 5 55.8
28.5	209 7 13.6	−4 34 29.2	28.5	248 1 21.8	−4 47 3.8	28.5	301 15 34.9	−1 29 1.7
29.0	216 42 38.6	4 48 26.4	29.0	255 40 39.0	4 32 18.4	29.0	308 26 12.8	0 51 10.6
29.5	224 20 16.9	4 57 19.4	29.5	263 17 30.9	4 12 45.5	29.5	315 30 17.1	−0 13 4.0
30.0	231 58 43.8	5 0 54.5	30.0	270 50 38.9	3 48 54.1	30.0	322 27 32.6	+0 24 39.8
30.5	239 36 33.4	4 59 7.4	30.5	278 18 54.8	3 21 19.3	30.5	329 17 54.5	1 1 26.6
31.0	247 12 22.5	−4 52 3.0	31.0	285 41 22.8	−2 50 40.3	31.0	336 1 27.5	+1 36 46.5
31.5	254 44 54.7	−4 39 55.2	31.5	292 57 20.8	−2 17 38.3	31.5	342 38 24.5	+2 10 14.1

210 MOON'S LONGITUDE AND LATITUDE, 1915.

FOR GREENWICH MEAN NOON AND MIDNIGHT.

Day of Month.	JULY.		Day of Month.	AUGUST.		Day of Month.	SEPTEMBER.	
	True Long.	Latitude.		True Long.	Latitude.		True Long.	Latit
	° ′ ″	° ′ ″		° ′ ″	° ′ ″		° ′ ″	° ′
1.0	336 1 27.5	+1 36 46.5	1.0	22 30 48.8	+4 47 25.1	1.0	66 37 8.6	+4 57
1.5	342 38 24.5	2 10 14.1	1.5	28 38 47.6	4 59 55.9	1.5	72 33 18.2	4 44
2.0	349 9 5.3	2 41 28.4	2.0	34 43 23.4	5 8 57.5	2.0	78 29 24.6	4 29
2.5	355 33 54.8	3 10 12.1	2.5	40 45 9.4	5 14 30.0	2.5	84 26 3.9	4 10
3.0	1 53 22.0	3 36 11.4	3.0	46 44 39.7	5 16 34.6	3.0	90 23 51.8	3 49
3.5	8 7 58.6	+3 59 15.4	3.5	52 42 28.5	+5 15 13.6	3.5	96 23 23.1	+3 25
4.0	14 18 17.9	4 19 15.8	4.0	58 39 9.8	5 10 30.2	4.0	102 25 11.4	2 59
4.5	20 24 54.2	4 36 6.2	4.5	64 35 16.8	5 2 28.1	4.5	108 29 48.4	2 31
5.0	26 28 22.1	4 49 41.9	5.0	70 31 21.8	4 51 11.9	5.0	114 37 43.4	2 1
5.5	32 29 15.3	4 59 59.7	5.5	76 27 55.6	4 36 47.4	5.5	120 49 22.8	1 28
6.0	38 28 6.6	+5 6 57.7	6.0	82 25 27.5	+4 19 21.3	6.0	127 5 9.6	+0 55
6.5	44 25 27.3	5 10 34.7	6.5	88 24 24.5	3 59 1.4	6.5	133 25 22.7	+0 20
7.0	50 21 47.1	5 10 50.6	7.0	94 25 11.5	3 35 56.9	7.0	139 50 16.4	−0 14
7.5	56 17 33.6	5 7 46.4	7.5	100 28 11.1	3 10 19.0	7.5	146 19 59.8	0 49
8.0	62 13 12.2	5 1 24.3	8.0	106 33 43.4	2 42 20.5	8.0	152 54 36.8	1 24
8.5	68 9 6.2	+4 51 47.7	8.5	112 42 5.6	+2 12 16.3	8.5	159 34 5.4	−1 59
9.0	74 5 36.7	4 39 1.1	9.0	118 53 32.4	1 40 23.6	9.0	166 18 17.9	2 32
9.5	80 3 2.5	4 23 10.3	9.5	125 8 15.6	1 7 1.7	9.5	173 7 0.7	3 3
10.0	86 1 40.7	4 4 22.9	10.0	131 26 24.4	+0 32 32.4	10.0	179 59 55.1	3 32
10.5	92 1 46.3	3 42 48.2	10.5	137 48 5.4	−0 2 40.5	10.5	186 56 37.4	3 58
11.0	98 3 32.7	+3 18 37.2	11.0	144 13 22.4	−0 38 11.3	11.0	193 56 39.7	−4 21
11.5	104 7 12.1	2 52 2.8	11.5	150 42 16.9	1 13 32.4	11.5	200 59 31.2	4 40
12.0	110 12 55.5	2 23 19.9	12.0	157 14 48.3	1 48 14.9	12.0	208 4 39.2	4 54
12.5	116 20 53.3	1 52 45.4	12.5	163 50 54.0	2 21 49.2	12.5	215 11 29.8	5 5
13.0	122 31 15.4	1 20 37.8	13.0	170 30 29.9	2 53 45.5	13.0	222 19 29.7	5 10
13.5	128 44 11.7	+0 47 17.5	13.5	177 13 30.2	−3 23 34.0	13.5	229 28 7.1	−5 11
14.0	134 59 52.3	+0 13 6.6	14.0	183 59 47.8	3 50 45.8	14.0	236 36 52.3	5 7
14.5	141 18 27.3	−0 21 31.4	14.5	190 49 14.6	4 14 53.7	14.5	243 45 18.7	4 58
15.0	147 40 7.5	0 56 11.8	15.0	197 41 41.5	4 35 32.4	15.0	250 53 2.9	4 44
15.5	154 5 4.4	1 30 28.7	15.5	204 36 58.6	4 52 19.3	15.5	257 59 45.1	4 26
16.0	160 33 29.8	−2 3 55.4	16.0	211 34 55.0	−5 4 55.0	16.0	265 5 8.7	−4 4
16.5	167 5 35.7	2 36 4.6	16.5	218 35 18.8	5 13 3.6	16.5	272 9 0.3	3 39
17.0	173 41 34.0	3 6 28.9	17.0	225 37 57.0	5 16 33.4	17.0	279 11 9.0	3 10 33
17.5	180 21 36.1	3 34 40.8	17.5	232 42 35.2	5 15 17.0	17.5	286 11 25.8	2 39 2
18.0	187 5 52.2	4 0 13.1	18.0	239 48 57.7	5 9 11.9	18.0	293 9 42.8	2 5 19
18.5	193 54 30.4	−4 22 39.2	18.5	246 56 46.9	−4 58 20.5	18.5	300 5 53.0	−1 29 55
19.0	200 47 36.1	4 41 33.9	19.0	254 5 43.4	4 42 50.3	19.0	306 59 49.6	0 53 24
19.5	207 45 10.7	4 56 33.7	19.5	261 15 25.8	4 22 54.4	19.5	313 51 25.4	−0 16 21
20.0	214 47 11.1	5 7 17.4	20.0	268 25 30.6	3 58 51.0	20.0	320 40 32.5	+0 20 41
20.5	221 53 28.7	5 13 26.9	20.5	275 35 32.5	3 31 3.3	20.5	327 27 2.4	0 57 9
21.0	229 3 48.6	−5 14 48.2	21.0	282 45 4.1	−2 59 59.0	21.0	334 10 46.1	+1 32 32
21.5	236 17 48.9	5 11 12.1	21.5	289 53 36.7	2 26 10.0	21.5	340 51 34.0	2 6 20
22.0	243 35 0.5	5 2 34.8	22.0	297 0 40.7	1 50 11.6	22.0	347 29 16.5	2 38 8
22.5	250 54 47.4	4 48 59.0	22.5	304 5 46.0	1 12 41.3	22.5	354 3 44.3	3 7 30
23.0	258 16 27.3	4 30 34.3	23.0	311 8 23.0	−0 34 17.7	23.0	0 34 49.2	3 34 8
23.5	265 39 12.5	−4 7 37.4	23.5	318 8 3.1	+0 4 20.4	23.5	7 2 24.4	+3 57 44
24.0	273 2 11.1	3 40 31.9	24.0	325 4 19.6	0 42 35.2	24.0	13 26 25.5	4 18 5
24.5	280 24 28.9	3 9 47.7	24.5	331 56 48.7	1 19 50.7	24.5	19 46 50.5	4 35 1
25.0	287 45 11.3	2 36 0.1	25.0	338 45 9.8	1 55 34.0	25.0	26 3 40.4	4 48 26
25.5	295 3 25.4	1 59 48.8	25.5	345 29 6.3	2 29 15.9	25.5	32 16 59.9	4 58 17
26.0	302 18 21.5	−1 21 55.9	26.0	352 8 26.2	+3 0 31.0	26.0	38 26 57.3	+5 4 33
26.5	309 29 15.1	0 43 4.3	26.5	358 43 2.4	3 28 58.2	26.5	44 33 44.6	5 7 16
27.0	316 35 28.0	−0 3 56.3	27.0	5 12 52.8	3 54 20.8	27.0	50 37 37.8	5 6 29
27.5	323 36 29.4	+0 34 47.8	27.5	11 38 0.4	4 16 26.0	27.5	56 38 56.7	5 2 18
28.0	330 31 56.6	1 12 30.9	28.0	17 58 33.2	4 35 4.8	28.0	62 38 4.4	4 54 40
28.5	337 21 34.7	+1 48 40.1	28.5	24 14 43.9	+4 50 11.4	28.5	68 35 27.6	+4 44 10
29.0	344 5 16.8	2 22 47.1	29.0	30 26 49.7	5 1 43.0	29.0	74 31 36.1	4 30 29
29.5	350 43 3.5	2 54 28.0	29.5	36 35 11.7	5 9 39.0	29.5	80 27 2.4	4 13 55
30.0	357 15 2.4	3 23 23.5	30.0	42 40 14.6	5 14 0.9	30.0	86 22 21.1	3 54 38
30.5	3 41 27.3	3 49 18.7	30.5	48 42 26.4	5 14 51.6	30.5	92 18 8.8	3 32 47
31.0	10 2 37.1	+4 12 2.3	31.0	54 42 17.4	+5 12 15.1	31.0	98 15 3.7	+3 8 34
31.5	16 18 55.2	+4 31 26.2	31.5	60 40 20.1	+5 6 16.6	31.5	104 13 44.6	+2 42 10

FOR GREENWICH MEAN NOON AND MIDNIGHT.

y of nth.	OCTOBER.						Day of Month.	NOVEMBER.						Day of Month.	DECEMBER.					
	True Long.			Latitude.				True Long.			Latitude.				True Long.			Latiude.		
	°	′	″	°	′	″		°	′	″	°	′	″		°	′	″	°	′	″
1.0	98	15	3.7	+3	8	34.4	1.0	142	50	34.7	−0	50	19.8	1.0	177	7	4.8	−3	43	11.2
1.5	104	13	44.6	2	42	10.5	1.5	149	11	33.2	1	23	4.4	1.5	183	51	42.2	4	6	5.4
2.0	110	14	50.8	2	13	48.4	2.0	155	38	42.4	1	55	15.8	2.0	190	43	50.3	4	25	53.0
2.5	116	19	1.2	1	43	41.8	2.5	162	12	31.8	2	26	27.5	2.5	197	43	35.7	4	42	5.2
3.0	122	26	53.7	1	12	6.2	3.0	168	53	24.5	2	56	10.7	3.0	204	50	53.8	4	54	14.2
3.5	128	39	4.4	+0	39	18.7	3.5	175	41	35.2	−3	23	54.9	3.5	212	5	26.9	−5	1	54.7
4.0	134	56	6.5	+0	5	38.6	4.0	182	37	8.9	3	49	8.2	4.0	219	26	43.4	5	4	45.1
4.5	141	18	29.5	−0	28	32.5	4.5	189	39	59.0	4	11	18.0	4.5	226	53	57.5	5	2	29.3
5.0	147	46	37.9	1	2	50.2	5.0	196	49	46.5	4	29	52.3	5.0	234	26	10.1	4	54	58.4
5.5	154	20	50.2	1	36	47.4	5.5	204	5	59.2	4	44	21.2	5.5	242	2	10.5	4	42	11.9
6.0	161	1	17.9	−2	9	54.9	6.0	211	27	51.8	−4	54	18.5	6.0	249	40	39.2	−4	24	18.5
6.5	167	48	4.0	2	41	41.3	6.5	218	54	27.1	4	59	23.5	6.5	257	20	11.2	4	1	36.5
7.0	174	41	2.6	3	11	33.5	7.0	226	24	37.6	4	59	22.1	7.0	264	59	20.1	3	34	33.3
7.5	181	39	58.1	3	38	57.6	7.5	233	57	8.7	4	54	8.1	7.5	272	36	42.2	3	3	43.7
8.0	188	44	25.1	4	3	20.1	8.0	241	30	42.0	4	43	44.2	8.0	280	11	0.1	2	29	48.6
8.5	195	53	48.8	−4	24	9.4	8.5	249	3	58.6	−4	28	22.0	8.5	287	41	5.7	−1	53	32.9
9.0	203	7	25.6	4	40	56.9	9.0	256	35	42.8	4	8	21.3	9.0	295	6	2.7	1	15	43.0
9.5	210	24	24.8	4	53	18.5	9.5	264	4	46.0	3	44	9.2	9.5	302	25	7.6	−0	37	4.7
0.0	217	43	50.6	5	0	55.6	10.0	271	30	9.0	3	16	18.6	10.0	309	37	49.9	+0	1	38.5
0.5	225	4	44.5	5	3	36.1	10.5	278	51	3.8	2	45	26.1	10.5	316	43	51.5	0	39	46.6
1.0	232	26	7.5	−5	1	15.6	11.0	286	6	53.9	−2	12	10.5	11.0	323	43	5.8	+1	16	43.8
1.5	239	47	2.9	4	53	56.7	11.5	293	17	14.9	1	37	11.4	11.5	330	35	36.2	1	51	59.2
2.0	247	6	38.7	4	41	49.1	12.0	300	21	53.6	1	1	7.7	12.0	337	21	34.4	2	25	6.6
2.5	254	24	9.0	4	25	9.2	12.5	307	20	46.6	−0	24	36.3	12.5	344	1	18.3	2	55	44.5
3.0	261	38	55.7	4	4	18.6	13.0	314	13	58.8	+0	11	48.2	13.0	350	35	10.5	3	23	35.3
3.5	268	50	29.0	−3	39	43.4	13.5	321	1	41.6	+0	47	34.1	13.5	357	3	37.0	+3	48	25.3
4.0	275	58	27.2	3	11	53.3	14.0	327	44	11.3	1	22	12.7	14.0	3	27	5.5	4	10	3.8
4.5	283	2	36.4	2	41	20.0	14.5	334	21	47.4	1	55	18.5	14.5	9	46	4.8	4	28	22.9
5.0	290	2	50.0	2	8	36.6	15.0	340	54	51.5	2	26	28.8	15.0	16	1	3.5	4	43	17.0
5.5	296	59	7.3	1	34	16.6	15.5	347	23	45.6	2	55	23.8	15.5	22	12	29.5	4	54	42.6
6.0	303	51	32.0	−0	58	53.2	16.0	353	48	51.5	+3	21	46.5	16.0	28	20	49.2	+5	2	38.1
6.5	310	40	11.1	−0	22	59.0	16.5	0	10	30.0	3	45	22.4	16.5	34	26	27.5	5	7	3.3
7.0	317	25	13.9	+0	12	54.6	17.0	6	29	0.4	4	5	59.2	17.0	40	29	47.5	5	7	59.6
7.5	324	6	51.0	0	48	17.6	17.5	12	44	39.9	4	23	27.0	17.5	46	31	10.2	5	5	30.0
8.0	330	45	12.7	1	22	42.0	18.0	18	57	43.6	4	37	38.0	18.0	52	30	54.4	4	59	38.8
8.5	337	20	28.5	+1	55	41.4	18.5	25	8	24.4	+4	48	26.6	18.5	58	29	17.2	+4	50	31.6
9.0	343	52	47.0	2	26	51.7	19.0	31	16	53.5	4	55	49.4	19.0	64	26	34.1	4	38	15.6
9.5	350	22	15.1	2	55	51.0	19.5	37	23	20.5	4	59	45.0	19.5	70	22	59.2	4	22	59.5
20.0	356	48	57.8	3	22	20.0	20.0	43	27	53.4	5	0	14.0	20.0	76	18	45.6	4	4	53.2
20.5	3	12	58.8	3	46	1.9	20.5	49	30	39.6	4	57	19.1	20.5	82	14	5.6	3	44	8.1
21.0	9	34	20.2	+4	6	42.4	21.0	55	31	46.3	+4	51	4.9	21.0	88	9	11.4	+3	20	57.0
21.5	15	53	3.2	4	24	10.2	21.5	61	31	20.8	4	41	37.8	21.5	94	4	15.4	2	55	33.8
22.0	22	9	8.4	4	38	17.0	22.0	67	29	31.5	4	29	5.9	22.0	99	59	30.6	2	28	13.6
22.5	28	22	36.4	4	48	57.0	22.5	73	26	27.8	4	13	38.6	22.5	105	55	10.8	1	59	12.6
23.0	34	33	28.7	4	56	7.1	23.0	79	22	20.7	3	55	26.9	23.0	111	51	31.1	1	28	48.1
23.5	40	41	47.8	+4	59	46.8	23.5	85	17	23.6	+3	34	42.9	23.5	117	48	48.2	+0	57	18.1
24.0	46	47	38.2	4	59	58.1	24.0	91	11	52.4	3	11	39.7	24.0	123	47	20.7	+0	25	1.2
24.5	52	51	6.6	4	56	44.9	24.5	97	6	5.6	2	46	31.2	24.5	129	47	29.0	−0	7	43.3
25.0	58	52	22.4	4	50	13.1	25.0	103	0	24.4	2	19	32.0	25.0	135	49	35.7	0	40	35.4
25.5	64	51	38.0	4	40	30.2	25.5	108	55	13.0	1	50	57.6	25.5	141	54	5.4	1	13	14.5
26.0	70	49	9.0	+4	27	44.9	26.0	114	50	58.8	+1	21	3.9	26.0	148	1	24.5	−1	45	19.7
26.5	76	45	14.7	4	12	7.1	26.5	120	48	12.0	0	50	7.4	26.5	154	12	1.2	2	16	29.5
27.0	82	40	17.5	3	53	47.5	27.0	126	47	25.3	+0	18	25.2	27.0	160	26	24.9	2	46	21.8
27.5	88	34	43.2	3	32	57.7	27.5	132	49	13.7	−0	13	44.8	27.5	166	45	5.8	3	14	34.1
28.0	94	29	0.9	3	9	49.7	28.0	138	54	14.3	0	46	4.0	28.0	173	8	33.9	3	40	43.1
28.5	100	23	42.8	+2	44	36.2	28.5	145	3	5.4	−1	18	12.5	28.5	179	37	18.3	−4	4	25.1
29.0	106	19	23.8	2	17	30.4	29.0	151	16	26.0	1	49	49.3	29.0	186	11	46.2	4	25	16.1
29.5	112	16	41.1	1	48	46.1	29.5	157	34	54.5	2	20	32.1	29.5	192	52	21.6	4	42	52.2
30.0	118	16	13.9	1	18	38.1	30.0	163	59	8.2	2	49	57.1	30.0	199	39	23.7	4	56	49.6
30.5	124	18	42.6	0	47	22.0	30.5	170	29	41.6	3	17	39.1	30.5	206	33	5.6	5	6	45.4
31.0	130	24	48.4	+0	15	14.4	31.0	177	7	4.8	−3	43	11.2	31.0	213	33	32.9	−5	12	18.7
31.5	136	35	12.4	−0	17	26.2	31.5	183	51	42.2	−4	6	5.4	31.5	220	40	41.7	−5	13	11.2

GREENWICH MEAN NOON.

Date.	MOON'S EQUATOR.			Γ' Longitude of the Moon's Perigee. Daily Motion, +6′.684.	☊ Mean Longitude of Moon's Ascending Node. Daily Motion, −3′.177.	☾ Moon's Mean Longitude.
	i Inclination to the Earth's Equator.	Δ Ascending Node on Earth's Equator to Ascending Node on Ecliptic.	☊′ Ascending Node on Earth's Equator.			
	° ′	° ′	° ′	° ′	° ′	° ′
Jan. 0	22 8.9	147 10.4	2 5.5	224 35.9	329 5.9	90 44.9
10	22 9.4	146 36.9	2 7.4	225 42.7	328 34.1	222 30.8
20	22 9.8	146 3.4	2 9.2	226 49.6	328 2.4	354 16.6
30	22 10.3	145 29.9	2 11.1	227 56.4	327 30.6	126 2.4
Feb. 9	22 10.8	144 56.5	2 12.9	229 3.3	326 58.8	257 48.3
19	22 11.3	144 23.0	2 14.8	230 10.1	326 27.1	29 34.1
Mar. 1	22 11.8	143 49.5	2 16.6	231 16.9	325 55.3	161 20.0
11	22 12.3	143 16.1	2 18.4	232 23.8	325 23.5	293 5.8
21	22 12.8	142 42.7	2 20.2	233 30.6	324 51.7	64 51.6
31	22 13.3	142 9.2	2 22.0	234 37.5	324 20.0	196 37.5
Apr. 10	22 13.9	141 35.8	2 23.8	235 44.3	323 48.2	328 23.3
20	22 14.4	141 2.4	2 25.5	236 51.2	323 16.4	100 9.1
30	22 14.9	140 29.1	2 27.3	237 58.0	322 44.6	231 55.0
May 10	22 15.5	139 55.7	2 29.0	239 4.8	322 12.9	3 40.8
20	22 16.0	139 22.4	2 30.7	240 11.7	321 41.1	135 26.7
30	22 16.6	138 49.0	2 32.4	241 18.5	321 9.3	267 12.5
June 9	22 17.1	138 15.7	2 34.1	242 25.4	320 37.6	38 58.3
19	22 17.7	137 42.4	2 35.8	243 32.2	320 5.8	170 44.2
29	22 18.3	137 9.2	2 37.4	244 39.0	319 34.0	302 30.0
July 9	22 18.9	136 35.9	2 39.0	245 45.9	319 2.2	74 15.9
19	22 19.4	136 2.6	2 40.7	246 52.7	318 30.5	206 1.7
29	22 20.0	135 29.4	2 42.3	247 59.6	317 58.7	337 47.5
Aug. 8	22 20.6	134 56.2	2 43.9	249 6.4	317 26.9	109 33.4
18	22 21.2	134 23.0	2 45.4	250 13.3	316 55.2	241 19.2
28	22 21.9	133 49.8	2 47.0	251 20.1	316 23.4	13 5.0
Sept. 7	22 22.5	133 16.6	2 48.5	252 26.9	315 51.6	144 50.9
17	22 23.1	132 43.4	2 50.1	253 33.8	315 19.8	276 36.7
27	22 23.7	132 10.2	2 51.6	254 40.6	314 48.1	48 22.6
Oct. 7	22 24.4	131 37.1	2 53.1	255 47.5	314 16.3	180 8.4
17	22 25.0	131 4.0	2 54.5	256 54.3	313 44.5	311 54.2
27	22 25.6	130 30.9	2 56.0	258 1.2	313 12.7	83 40.1
Nov. 6	22 26.3	129 57.8	2 57.4	259 8.0	312 41.0	215 25.9
16	22 26.9	129 24.7	2 58.9	260 14.8	312 9.2	347 11.7
26	22 27.6	128 51.6	3 0.3	261 21.7	311 37.4	118 57.6
Dec. 6	22 28.3	128 18.6	3 1.7	262 28.5	311 5.7	250 43.4
16	22 28.9	127 45.6	3 3.0	263 35.4	310 33.9	22 29.3
26	22 29.6	127 12.6	3 4.4	264 42.2	310 2.1	154 15.1
36	22 30.3	126 39.6	3 5.7	265 49.1	309 30.3	286 0.9

Mean Solar Days.	Motion Moon in Me Longitu
	° ′
0.1	1 19.
0.2	2 38.
0.3	3 57.
0.4	5 16.
0.5	6 35.
0.6	7 54.
0.7	9 13.
0.8	10 32.
0.9	11 51.
1.0	13 10.
2.0	26 21.
3.0	39 31.
4.0	52 42.
5.0	65 52.
6.0	79 3.
7.0	92 14.
8.0	105 24.
9.0	118 35.
10.0	131 45.
Hours.	° ′
1	0 32.
2	1 5.
3	1 38.
4	2 11.
5	2 44.
6	3 17.
7	3 50.
8	4 23.
9	4 56.
10	5 29.
11	6 2.
12	6 35.
13	7 8.
14	7 41.
15	8 14.
16	8 47.
17	9 20.
18	9 52.
19	10 25.
20	10 58.
21	11 31.
22	12 4.
23	12 37.

QUANTITIES REQUIRED IN COMPUTING THE MOON'S LIBRATION.

ARGUMENT, (☊−λ), or (☊−λ−180°).

☊−λ	μ	$\frac{1}{A}$	B	☊−λ
°	′		° ′	°
0	0.0	37	0 0.0	180
2	0.0	37	0 3.2	178
4	0.1	37	0 6.4	176
6	0.1	38	0 9.6	174
8	0.2	38	0 12.8	172
10	0.2	38	0 16.0	170
12	0.3	38	0 19.2	168
14	0.3	38	0 22.3	166
16	0.3	39	0 25.4	164
18	0.4	39	0 28.5	162
20	0.4	40	0 31.5	160
22	0.4	40	0 34.5	158
24	0.5	41	0 37.5	156
26	0.5	42	0 40.4	154
28	0.5	42	0 43.2	152
30	0.5	43	0 46.1	150
32	0.6	44	0 48.8	148
34	0.6	45	0 51.5	146
36	0.6	46	0 54.1	144
38	0.6	47	0 56.7	142
40	0.6	49	0 59.2	140
42	0.6	50	1 1.6	138
44	0.6	52	1 4.0	136
46	0.6	54	1 6.3	134
48	0.6	56	1 8.5	132
50	0.6	58	1 10.6	130
52	0.6	61	1 12.6	128
54	0.6	64	1 14.5	126
56	0.6	67	1 16.4	124
58	0.6	70	1 18.1	122
60	0.5	75	1 19.8	120
62	0.5	80	1 21.3	118
64	0.5	85	1 22.8	116
66	0.5	92	1 24.1	114
68	0.4	100	1 25.4	112
70	0.4	109	1 26.5	110
72	0.4	121	1 27.6	108
74	0.3	135	1 28.5	106
76	0.3	154	1 29.4	104
78	0.3	180	1 30.1	102
80	0.2	215	1 30.7	100
82	0.2	268	1 31.2	98
84	0.1	357	1 31.6	96
86	0.1	535	1 31.9	94
88	0.0	1070	1 32.0	92
90	0.0	∞	1 32.1	90

μ has the sign of tan (λ−☊)
A has the sign of cos (☊−λ)
B has the sign of sin (☊−λ)
See formulæ, page xi.

SUN'S ABERRATION AND HORIZONTAL PARALLAX.

FOR GREENWICH MEAN NOON.

Date.	Aberration.	Hor. Par.
1915.	″	″
Jan. 0	−20.81	8.95
10	20.81	8.95
20	20.80	8.94
30	20.77	8.93
Feb. 9	20.74	8.92
19	−20.70	8.90
Mar. 1	20.65	8.88
11	20.60	8.86
21	20.54	8.83
31	20.48	8.81
Apr. 10	−20.42	8.78
20	20.36	8.76
30	20.31	8.73
May 10	20.26	8.71
20	20.22	8.69
30	−20.18	8.68
June 9	20.16	8.67
19	20.14	8.66
29	20.13	8.66
July 9	20.13	8.66
19	−20.14	8.66
29	20.16	8.67
Aug. 8	20.18	8.68
18	20.22	8.69
28	20.26	8.71
Sept. 7	−20.31	8.73
17	20.36	8.76
27	20.42	8.78
Oct. 7	20.48	8.81
17	20.54	8.83
27	−20.59	8.86
Nov. 6	20.65	8.88
16	20.70	8.90
26	20.74	8.92
Dec. 6	20.77	8.93
16	−20.79	8.94
26	20.81	8.95
36	−20.81	8.95

Sun's Mean Equatorial Horizontal Parallax.

8″.80; log=0.94448.

PRECESSION AND OBLIQUITY, 1915.

(CONSTANTS OF PARIS CONFERENCE.)

FOR GREENWICH MEAN NOON.

Date.	Precession in Longitude from 1915.0.	Nutation.			Obliquity of Ecliptic. (*Newcomb.*)	Date.	Precession in Longitude from 1915.0.	Nutation.			Obliquit of Ecliptic (*Newco*
		δ′ ψ In Longitude.	δ′ α In R. A.	δ′ ω In Obliquity.				δ′ ψ In Longitude.	δ′ α In R. A.	δ′ ω In Obliquity.	
	″	″	s	″	23° 27′ ″		″	″	s	″	23° 27′ ″
Jan. 0	− 0.13	+ 9.07	+0.554	+7.33	8.56	July 4	+25.32	+11.51	+0.704	+6.48	7.47
5	+ 0.56	9.35	0.572	7.35	8.57	9	26.01	11.75	0.719	6.50	7.49
10	1.25	9.62	0.588	7.38	8.60	14	26.70	11.96	0.732	6.52	7.50
15	1.94	9.86	0.603	7.43	8.64	19	27.39	12.15	0.743	6.56	7.53
20	2.62	10.07	0.616	7.48	8.69	24	28.08	12.32	0.753	6.60	7.57
25	+ 3.31	+10.25	+0.627	+7.54	8.74	29	+28.76	+12.45	+0.762	+6.65	7.61
30	4.00	10.40	0.636	7.62	8.81	Aug. 3	29.45	12.55	0.768	6.71	7.66
Feb. 4	4.69	10.49	0.642	7.70	8.88	8	30.14	12.62	0.772	6.78	7.73
9	5.38	10.55	0.645	7.77	8.95	13	30.83	12.65	0.774	6.84	7.78
14	6.06	10.57	0.646	7.84	9.01	18	31.52	12.65	0.774	6.90	7.83
19	+ 6.75	+10.55	+0.645	+7.91	9.07	23	+32.20	+12.62	+0.772	+6.96	7.88
24	7.44	10.50	0.642	7.97	9.13	28	32.89	12.56	0.768	7.01	7.93
Mar. 1	8.13	10.41	0.637	8.02	9.17	Sept. 2	33.58	12.46	0.762	7.04	7.96
6	8.82	10.30	0.630	8.04	9.19	7	34.27	12.35	0.755	7.07	7.98
11	9.50	10.17	0.622	8.06	9.21	12	34.95	12.22	0.747	7.08	7.99
16	+10.19	+10.04	+0.613	+8.06	9.19	17	+35.64	+12.07	+0.738	+7.08	7.98
21	10.88	9.88	0.604	8.05	9.17	22	36.33	11.90	0.729	7.06	7.95
26	11.57	9.72	0.595	8.02	9.14	27	37.02	11.75	0.719	7.03	7.92
31	12.25	9.58	0.586	7.98	9.10	Oct. 2	37.71	11.59	0.709	6.98	7.86
Apr. 5	12.94	9.45	0.578	7.91	9.02	7	38.39	11.44	0.700	6.92	7.79
10	+13.63	+ 9.34	+0.571	+7.84	8.94	12	+39.08	+11.31	+0.692	+6.84	7.71
15	14.32	9.24	0.566	7.74	8.84	17	39.77	11.21	0.686	6.75	7.61
20	15.01	9.18	0.562	7.65	8.74	22	40.46	11.12	0.681	6.64	7.50
25	15.69	9.14	0.560	7.54	8.62	27	41.15	11.08	0.678	6.53	7.38
30	16.38	9.14	0.559	7.43	8.50	Nov. 1	41.83	11.06	0.677	6.41	7.25
May 5	+17.07	+ 9.17	+0.561	+7.31	8.38	6	+42.52	+11.09	+0.678	+6.28	7.12
10	17.76	9.24	0.565	7.19	8.26	11	43.21	11.15	0.682	6.16	6.98
15	18.45	9.34	0.571	7.08	8.13	16	43.90	11.26	0.689	6.03	6.85
20	19.13	9.47	0.579	6.97	8.02	21	44.58	11.40	0.698	5.91	6.72
25	19.82	9.63	0.589	6.87	7.91	26	45.27	11.59	0.709	5.80	6.61
30	+20.51	+ 9.82	+0.601	+6.78	7.82	Dec. 1	+45.96	+11.79	+0.722	+5.69	6.50
June 4	21.20	10.03	0.614	6.69	7.72	6	46.65	12.03	0.736	5.60	6.40
9	21.88	10.26	0.628	6.63	7.65	11	47.34	12.29	0.752	5.52	6.31
14	22.57	10.50	0.643	6.57	7.59	16	48.02	12.57	0.769	5.46	6.24
19	23.26	10.76	0.658	6.52	7.53	21	48.71	12.86	0.786	5.41	6.19
24	+23.95	+11.02	+0.673	+6.49	7.49	26	+49.40	+13.15	+0.804	+5.39	6.16
29	24.64	11.27	0.689	6.48	7.48	31	50.09	13.43	0.822	5.38	6.14
July 4	+25.32	+11.51	+0.704	+6.48	7.47	36	+50.77	+13.71	+0.839	+5.39	6.15

Precession for 1915.0 . . ″ 50.2597 log=1.701220
Precession in a Solar day . 0.13761 log=9.13865
Precession in a Sidereal day 0.13723 log=9.13745
The short period terms of the Nutation are given for Washington midnight on pp. 231–232.

Mean Obliquity, 1915.0.	° ′ ″
Newcomb	23 27 1.23
Hansen	23 27 1.00
Le Verrier	23 27 0.89
Peters	23 27 0.78

PART II.

ASTRONOMICAL EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

The constants of precession, nutation and aberration adopted by the *Conf* *ence Internationale des Étoiles Fondamentales* which met in Paris in May, 1896, a given on page xiv, and together with the notation of Bessel are used in the f mulæ which follow.

BESSELIAN STAR-NUMBERS.

Terms of Long Period.	*Terms of Short Period.*
$A=\tau-0.342\,20\sin\text{☊}$	$-0.004\,05\sin 2\text{☾}$
$+0.004\,15\sin 2\text{☊}$	$+0.000\,23\sin(\text{☾}+\Gamma')$
$-0.025\,26\sin 2\mathrm{L}$	$+0.001\,34\sin(\text{☾}-\Gamma')$
$+0.002\,51\sin(\mathrm{L}-\Gamma)$	$-0.000\,68\sin(2\text{☾}-\text{☊})$
$-0.000\,99\sin(3\mathrm{L}-\Gamma)$	$-0.000\,52\sin(3\text{☾}-\Gamma')$
$+0.000\,42\sin(\mathrm{L}+\Gamma)$	$+0.000\,30\sin(\text{☾}-2\mathrm{L}+\Gamma')$
$+0.000\,25\sin(2\mathrm{L}-\text{☊})$	$+0.000\,12\sin 2(\text{☾}-\mathrm{L})$
″	″
$B=-9.210\cos\text{☊}$	$-0.088\cos 2\text{☾}$
$+0.090\cos 2\text{☊}$	$-0.018\cos(2\text{☾}-\text{☊})$
$-0.552\cos 2\mathrm{L}$	$-0.011\cos(3\text{☾}-\Gamma')$
$-0.022\cos(3\mathrm{L}-\Gamma)$	$+0.005\cos(\text{☾}+\Gamma')$
$+0.009\cos(\mathrm{L}+\Gamma)$	
$+0.007\cos(2\mathrm{L}-\text{☊})$	

$$C=-20.4700\cos\omega\cos\odot$$

$$D=-20.4700\sin\odot$$

$$E=-0.0417\sin\text{☊}+0''.0005\sin 2\text{☊}-0''.0031\sin 2\mathrm{L}$$

Bessel's *Star-Constants.*

$a=3^{s}.072\,62+1^{s}.336\,38\sin\alpha_0\tan\delta_0$

$b=\tfrac{1}{15}\cos\alpha_0\tan\delta_0$

$c=\tfrac{1}{15}\cos\alpha_0\sec\delta_0$

$d=\tfrac{1}{15}\sin\alpha_0\sec\delta_0$

$a'=20''.0455\cos\alpha_0$

$b'=-\sin\alpha_0$

$c'=\tan\omega\cos\delta_0-\sin\alpha_0\sin\delta_0$

$d'=\cos\alpha_0\sin\delta_0$

Formulæ for Reduction to Apparent Position.

$$^{*}\alpha=\alpha_0+\tau\mu+Aa+Bb+Cc+Dd+\tfrac{1}{15}E \qquad \text{(in time)}$$

$$\delta=\delta_0+\tau\mu'+Aa'+Bb'+Cc'+Dd' \qquad \text{(in arc)}$$

INDEPENDENT STAR-NUMBERS.

$$f+f'=+46''.0892\,A+E\ \text{(in arc)}=3^{s}.072\,62\,A+\tfrac{1}{15}E \qquad \text{(in time)}$$

$$\begin{aligned}f'=&-0^{s}.0124\sin 2\text{☾}+0^{s}.0041\sin(\text{☾}-\Gamma')+0^{s}.0007\sin(\text{☾}+\Gamma')\\&-0^{s}.0021\sin(2\text{☾}-\text{☊})-0^{s}.0016\sin(3\text{☾}-\Gamma')\\&+0^{s}.0009\sin(\text{☾}-2\mathrm{L}+\Gamma')+0^{s}.0004\sin 2(\text{☾}-\mathrm{L})\end{aligned}$$

$g\sin G=B$ $\qquad h\sin H=C$ $\qquad i=C\tan\omega$

$g\cos G=20''.0455\,A$ $\qquad h\cos H=D$

Formulæ for Reduction to Apparent Position.

$$^{*}\alpha=\alpha_0+f+f'+\tau\mu+\tfrac{1}{15}g\sin(G+\alpha_0)\tan\delta_0+\tfrac{1}{15}h\sin(H+\alpha_0)\sec\delta_0 \qquad \text{(in time)}$$

$$\delta=\delta_0+\tau\mu'+g\cos(G+\alpha_0)+h\cos(H+\alpha_0)\sin\delta_0+i\cos\delta_0 \qquad \text{(in arc)}$$

In the above formulæ,

τ denotes the time reckoned in units of one year, from the beginning of the Besselian fictitious year (1915, January $0^{d}.732$, Washington mean time),

α_0, δ_0, the star's mean R. A. and Decl. at the beginning of the fictitious year,

α, δ, the star's apparent right ascension and declination at the time τ,

μ, μ', the annual proper motion in right ascension and declination,

$\odot$, the Sun's true longitude,
L, the Sun's mean longitude,
☊, the longitude of the Moon's ascending node,

ω, the obliquity of the ecliptic,
Γ, the long. of the Sun's perigee,
Γ', the long. of the Moon's perigee,
☾, the Moon's mean longitude.

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* See page 217 for statement concerning the use of these formulæ.

The independent star-numbers are more convenient than BESSEL'S, when only e or two apparent positions of a star are required, or when BESSEL'S star-nstants are not known with sufficient accuracy.

In using the star-constants of the *British Association Catalogue*, a, b, c, d, a', b', d', with the star-numbers of this Ephemeris, the quantities to be computed are , Bd, Ca, Db, $-Ac'$, $-Bd'$, $-Ca'$, $-Db'$.

In the computation of the independent star-numbers given for Washington an midnight of each day of the year, on pages 222–229, the short-period terms—at is, the terms involving the Moon's mean longitude—have been included in the o columns headed G and Log g. The quantities f and f' correspond to f' and f'', pectively, as given on the page of constants in Part IV of the American Ephemeris the years 1901 to 1911, inclusive, and are tabulated in the third and fourth lumns, respectively, giving separately the effect of the long-period and short-riod terms. f' differs but slightly from the term $-0''.1866 \sin 2☾ + 0''.0622 \sin$ $-\Gamma'$) given on page 37 of the *Procès-Verbaux* of the Paris Conference, and also page 289 of the American Ephemeris and Nautical Almanac for 1900. In com-ting the reduction of stars from mean to apparent place, or vice versa, using the lependent star-numbers, the quantity f' (which is the same for all stars) should omitted in using the formulæ for α on page 216, in case it is desired to make the duction in conformity with the decision of the Paris Conference with reference this matter. See page of *Procès-Verbaux* above cited.

In the computation of the Besselian star-numbers, pages 218–221, all short-riod terms have been included, and hence in using these quantities in the reduction stars to apparent place by means of the formulæ for that purpose on page 216, f' ust be subtracted from the final result if it is desired, in compliance with the cision of the Paris Conference, to omit that quantity.

In computing the ephemerides of the circumpolar stars in this volume, all ort-period terms have been included, excepting the quantity f' above mentioned, hich has been omitted.

In the computation of the ephemerides of the ten-day stars, no short-period rms have been included. These terms attain two maxima and two minima uring the tropical month. At maximum and minimum they may amount in ght ascension to $\pm 0^s.008 \tan \delta$, and in declination to $\pm 0''.13$. For computing e effect of these terms for the correction of the positions of stars interpolated om the ten-day ephemerides, the following formulæ may be used, in which $\Delta\alpha$ nd $\Delta\delta$ denote the effect of the short-period terms in right ascension and decli-ation, respectively, and $\delta''\psi$ and $\delta''\omega$, the sum of the short-period terms of the utation in longitude and obliquity:

$$\Delta\alpha = D'_{\psi}\alpha\ \delta''\psi + D_{\omega}\alpha\ \delta''\omega$$
$$\Delta\delta = D_{\psi}\delta\ \delta''\psi + D_{\omega}\delta\ \delta''\omega$$

The values of $\delta''\psi$ and of $\delta''\omega$ for Washington mean midnight are given for ach day of the year on pages 231–232, and have been computed as follows:

$$\delta''\psi = 50''.37\, A_2 \qquad\qquad \delta''\omega = -B_2$$

n which A_2 and B_2 are the sums of the short-period terms given in the expressions or A and B on page 216.

The quantities $D'_{\psi}\alpha$, $D_{\omega}\alpha$, $D_{\psi}\delta$, and $D_{\omega}\delta$ are given for each ten-day star on pages 287–486, and have been computed by means of the following formulæ:

$$D'_{\psi}\alpha = \tfrac{1}{15} \sin\alpha \tan\delta \sin\omega \qquad\qquad D_{\omega}\alpha = -\tfrac{1}{15} \cos\alpha \tan\delta$$
$$D_{\psi}\delta = \cos\alpha \sin\omega \qquad\qquad D_{\omega}\delta = \sin\alpha$$

The complete derivative of the right ascension with reference to ψ is

$$D_{\psi}\alpha = \tfrac{1}{15}\,(\cos\omega + \sin\alpha \tan\delta \sin\omega)$$

and the omission of the term $\frac{1}{15}\cos\omega$ is made in accordance with the above-mentioned decision of the Paris Conference with reference to the quantity f'.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)		Log *A*.	Log *B*.	Log *C*.	Log
Jan.	0	+9.25629	−0.8594	−0.50104	+1.30484	Feb.	15	+9.52795	−0.9012	−1.19460	+1.05
	1	9.26940	0.8608	0.54388	1.30345		16	9.52862	0.9019	1.19958	1.04
	2	9.28096	0.8632	0.58276	1.30191		17	9.52953	0.9015	1.20436	1.029
	3	9.29041	0.8662	0.61831	1.30023		18	9.53104	0.9004	1.20896	1.01
h	4	9.29758	0.8692	0.65104	1.29841	h	19	9.53335	0.8989	1.21337	1.003
(7.0)	5	+9.30272	−0.8716	−0.68135	+1.29644	(10.0)	20	+9.53653	−0.8973	−1.21761	+0.98
	6	9.30651	0.8728	0.70956	1.29432		21	9.54050	0.8961	1.22167	0.975
	7	9.30999	0.8726	0.73591	1.29206		22	9.54512	0.8954	1.22555	0.960
	8	9.31440	0.8711	0.76063	1.28964		23	9.55015	0.8956	1.22927	0.94
	9	9.32069	0.8687	0.78390	1.28708		24	9.55521	0.8968	1.23282	0.928
	10	+9.32927	−0.8660	−0.80583	+1.28436		25	+9.55991	−0.8988	−1.23620	+0.911
	11	9.33991	0.8639	0.82659	1.28148		26	9.56380	0.9016	1.23943	0.893
	12	9.35182	0.8629	0.84627	1.27845		27	9.56672	0.9046	1.24250	0.874
	13	9.36391	0.8635	0.86496	1.27525		28	9.56853	0.9074	1.24541	0.854
	14	9.37501	0.8656	0.88275	1.27190	Mar.	1	9.56939	0.9093	1.24817	0.833
	15	+9.38430	−0.8687	−0.89970	+1.26838		2	+9.56974	−0.9101	−1.25078	+0.811
	16	9.39144	0.8723	0.91589	1.26469		3	9.57015	0.9095	1.25324	0.787
	17	9.39653	0.8756	0.93135	1.26084		4	9.57122	0.9078	1.25555	0.762
	18	9.40005	0.8781	0.94615	1.25681		5	9.57344	0.9053	1.25772	0.736
	19	9.40266	0.8796	0.96032	1.25261	h	6	9.57699	0.9028	1.25974	0.707
h	20	+9.40504	−0.8798	−0.97392	+1.24823	(11.0)	7	+9.58164	−0.9009	−1.26162	+0.677
(8.0)	21	9.40783	0.8793	0.98696	1.24366		8	9.58694	0.9002	1.26337	0.64
	22	9.41150	0.8780	0.99948	1.23891		9	9.59217	0.9009	1.26497	0.608
	23	9.41627	0.8764	1.01152	1.23398		10	9.59679	0.9028	1.26643	0.569
	24	9.42215	0.8749	1.02310	1.22884		11	9.60029	0.9054	1.26776	0.52607
	25	+9.42901	−0.8739	−1.03424	+1.22351		12	+9.60257	−0.9082	−1.26895	+0.47794
	26	9.43659	0.8736	1.04496	1.21798		13	9.60370	0.9104	1.27000	0.42370
	27	9.44444	0.8743	1.05529	1.21224		14	9.60404	0.9118	1.27092	0.36157
	28	9.45211	0.8761	1.06525	1.20628		15	9.60408	0.9121	1.27171	0.28894
	29	9.45909	0.8788	1.07484	1.20011		16	9.60419	0.9113	1.27237	0.20157
	30	+9.46488	−0.8822	−1.08409	+1.19371		17	+9.60473	−0.9096	−1.27289	+0.09198
	31	9.46922	0.8857	1.09301	1.18708		18	9.60599	0.9074	1.27328	9.94498
Feb.	1	9.47214	0.8888	1.10162	1.18021		19	9.60801	0.9050	1.27354	9.72102
	2	9.47395	0.8909	1.10992	1.17309		20	9.61076	0.9028	1.27367	+9.23343
	3	9.47529	0.8917	1.11793	1.16572	h	21	9.61413	0.9011	1.27366	−9.26374
h	4	+9.47697	−0.8911	−1.12566	+1.15808	(12.0)	22	+9.61791	−0.9001	−1.27353	−9.73076
(9.0)	5	9.47969	0.8895	1.13312	1.15017		23	9.62183	0.9001	1.27327	9.95038
	6	9.48391	0.8873	1.14032	1.14197		24	9.62556	0.9009	1.27287	0.09537
	7	9.48972	0.8854	1.14727	1.13349		25	9.62885	0.9026	1.27235	0.20372
	8	9.49673	0.8844	1.15397	1.12469		26	9.63134	0.9046	1.27170	0.29020
	9	+9.50423	−0.8848	−1.16043	+1.11558		27	+9.63297	−0.9065	−1.27092	−0.36214
	10	9.51135	0.8866	1.16667	1.10614		28	9.63377	0.9079	1.27000	0.42369
	11	9.51739	0.8895	1.17268	1.09635		29	9.63400	0.9081	1.26896	0.47745
	12	9.52199	0.8931	1.17847	1.08621		30	9.63421	0.9070	1.26778	0.52513
	13	9.52509	0.8965	1.18405	1.07569		31	9.63487	0.9047	1.26648	0.56796
	14	+9.52691	−0.8993	−1.18943	+1.06477	Apr.	1	+9.63644	−0.9014	−1.26504	−0.60679
	15	+9.52795	−0.9012	−1.19460	+1.05343		2	+9.63917	−0.8979	−1.26346	−0.64231

$E = +0''.02 = +0^{s}.002$

FOR WASHINGTON MEAN MIDNIGHT.

Day. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
1	+9.63644	−0.9014	−1.26504	−0.60679	May 17	+9.74970	−0.8411	−1.01905	−1.23069
2	9.63917	0.8979	1.26346	0.64231	18	9.75318	0.8415	1.00794	1.23549
3	9.64296	0.8947	1.26176	0.67500	19	9.75618	0.8427	0.99643	1.24011
4	9.64744	0.8926	1.25992	0.70526	20	9.75858	0.8442	0.98448	1.24456
5	9.65216	0.8919	1.25794	0.73343	h 21	9.76038	0.8454	0.97207	1.24884
6	+9.65644	−0.8924	−1.25583	−0.75974	(16.0) 22	+9.76163	−0.8458	−0.95918	−1.25296
0) 7	9.65993	0.8940	1.25358	0.78441	23	9.76265	0.8449	0.94577	1.25692
8	9.66233	0.8959	1.25118	0.80764	24	9.76374	0.8426	0.93182	1.26072
9	9.66368	0.8975	1.24865	0.82954	25	9.76535	0.8390	0.91728	1.26436
10	9.66428	0.8984	1.24598	0.85026	26	9.76777	0.8345	0.90212	1.26785
11	+9.66445	−0.8981	−1.24317	−0.86991	27	+9.77106	−0.8301	−0.88629	−1.27119
12	9.66467	0.8966	1.24021	0.88857	28	9.77511	0.8263	0.86974	1.27438
13	9.66520	0.8942	1.23710	0.90634	29	9.77960	0.8241	0.85242	1.27743
14	9.66632	0.8911	1.23384	0.92327	30	9.78409	0.8236	0.83426	1.28034
15	9.66817	0.8878	1.23044	0.93944	31	9.78816	0.8246	0.81518	1.28310
16	+9.67066	−0.8845	−1.22688	−0.95489	June 1	+9.79148	−0.8266	−0.79510	−1.28573
17	9.67373	0.8816	1.22316	0.96969	2	9.79399	0.8288	0.77392	1.28821
18	9.67728	0.8796	1.21929	0.98386	3	9.79574	0.8304	0.75154	1.29057
19	9.68097	0.8784	1.21526	0.99746	4	9.79696	0.8311	0.72781	1.29279
20	9.68462	0.8782	1.21107	1.01051	h 5	9.79795	0.8304	0.70259	1.29488
h 21	+9.68793	−0.8788	−1.20671	−1.02306	(17.0) 6	+9.79904	−0.8284	−0.67569	−1.29683
.0) 22	9.69066	0.8801	1.20218	1.03512	7	9.80045	0.8255	0.64689	1.29866
23	9.69263	0.8815	1.19748	1.04672	8	9.80233	0.8220	0.61592	1.30036
24	9.69392	0.8824	1.19261	1.05790	9	9.80474	0.8185	0.58245	1.30193
25	9.69467	0.8824	1.18756	1.06866	10	9.80759	0.8153	0.54606	1.30337
26	+9.69529	−0.8810	−1.18232	−1.07904	11	+9.81083	−0.8129	−0.50621	−1.30469
27	9.69614	0.8782	1.17690	1.08905	12	9.81430	0.8115	0.46220	1.30588
28	9.69772	0.8744	1.17128	1.09870	13	9.81778	0.8113	0.41311	1.30695
29	9.70029	0.8700	1.16547	1.10802	14	9.82113	0.8122	0.35762	1.30790
30	9.70386	0.8658	1.15945	1.11701	15	9.82412	0.8140	0.29387	1.30872
ay 1	+9.70821	−0.8626	−1.15323	−1.12570	16	+9.82659	−0.8164	−0.21900	−1.30943
2	9.71288	0.8607	1.14679	1.13409	17	9.82851	0.8187	0.12834	1.31001
3	9.71736	0.8603	1.14013	1.14220	18	9.82994	0.8203	0.01351	1.31046
4	9.72127	0.8612	1.13325	1.15003	19	9.83100	0.8207	9.85681	1.31080
5	9.72423	0.8628	1.12613	1.15760	20	9.83207	0.8197	9.60912	1.31102
h 6	+9.72626	−0.8643	−1.11877	−1.16491	h 21	+9.83341	−0.8171	−8.97280	−1.31111
15.0) 7	9.72750	0.8651	1.11116	1.17198	(18.0) 22	9.83535	0.8136	+9.33976	1.31109
8	9.72828	0.8648	1.10329	1.17881	23	9.83805	0.8098	9.72521	1.31095
9	9.72893	0.8633	1.09516	1.18541	24	9.84144	0.8066	9.92604	1.31068
10	9.72981	0.8607	1.08674	1.19179	25	9.84532	0.8046	0.06273	1.31030
11	+9.73117	−0.8572	−1.07804	−1.19795	26	+9.84934	−0.8045	+0.16645	−1.30979
12	9.73312	0.8533	1.06904	1.20390	27	9.85312	0.8061	0.25000	1.30916
13	9.73570	0.8495	1.05972	1.20964	28	9.85636	0.8089	0.31994	1.30842
14	9.73879	0.8460	1.05008	1.21519	29	9.85885	0.8122	0.38005	1.30755
15	9.74230	0.8434	1.04010	1.22054	30	9.86068	0.8153	0.43274	1.30655
16	+9.74601	−0.8417	−1.02976	−1.22571	July 1	+9.86196	−0.8173	+0.47963	−1.30544
17	+9.74970	−0.8411	−1.01905	−1.23069	2	+9.86292	−0.8181	+0.52183	−1.30420

$E = +0''.02 = +0^{s}.002$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.
July 1	+9.86196	−0.8173	+0.47963	−1.30544	Aug. 16	+9.93928	−0.8373	+1.17729	−1.08
2	9.86292	0.8181	0.52183	1.30420	17	9.94098	0.8349	1.18265	1.07
3	9.86385	0.8175	0.56018	1.30284	18	9.94320	0.8332	1.18782	1.06
4	9.86500	0.8157	0.59531	1.30135	19	9.94570	0.8329	1.19281	1.057
5	9.86650	0.8133	0.62770	1.29974	20	9.94828	0.8342	1.19762	1.04
h 6	+9.86847	−0.8107	+0.65774	−1.29800	h 21	+9.95057	−0.8369	+1.20226	−1.03
(19.0) 7	9.87080	0.8083	0.68572	1.29613	(22.0) 22	9.95237	0.8406	1.20673	1.02
8	9.87348	0.8067	0.71189	1.29414	23	9.95359	0.8444	1.21104	1.01
9	9.87637	0.8060	0.73647	1.29201	24	9.95432	0.8477	1.21518	0.997
10	9.87934	0.8064	0.75961	1.28975	25	9.95466	0.8498	1.21917	0.98
11	+9.88220	−0.8081	+0.78147	−1.28736	26	+9.95484	−0.8505	+1.22300	−0.97
12	9.88483	0.8107	0.80217	1.28483	27	9.95508	0.8500	1.22667	0.955
13	9.88703	0.8139	0.82182	1.28217	28	9.95555	0.8485	1.23019	0.940
14	9.88875	0.8173	0.84050	1.27937	29	9.95634	0.8464	1.23357	0.92
15	9.88999	0.8201	0.85830	1.27643	30	9.95748	0.8444	1.23679	0.907
16	+9.89088	−0.8219	+0.87528	−1.27335	31	+9.95892	−0.8427	+1.23988	−0.890
17	9.89162	0.8222	0.89150	1.27012	Sept. 1	9.96059	0.8418	1.24282	0.872
18	9.89247	0.8212	0.90703	1.26675	2	9.96238	0.8417	1.24561	0.852
19	9.89375	0.8189	0.92190	1.26324	3	9.96418	0.8427	1.24827	0.832
20	9.89565	0.8160	0.93617	1.25957	4	9.96584	0.8446	1.25079	0.811
h 21	+9.89818	−0.8134	+0.94986	−1.25574	h 5	+9.96728	−0.8472	+1.25317	−0.788
(20.0) 22	9.90120	0.8120	0.96302	1.25177	(23.0) 6	9.96838	0.8501	1.25542	0.764
23	9.90448	0.8121	0.97568	1.24763	7	9.96908	0.8529	1.25753	0.738
24	9.90764	0.8139	0.98787	1.24333	8	9.96945	0.8550	1.25951	0.711
25	9.91041	0.8172	0.99960	1.23887	9	9.96957	0.8559	1.26136	0.681
26	+9.91262	−0.8212	+1.01092	−1.23423	10	+9.96965	−0.8555	+1.26308	−0.650
27	9.91417	0.8252	1.02183	1.22943	11	9.96994	0.8537	1.26466	0.615
28	9.91520	0.8282	1.03235	1.22444	12	9.97060	0.8509	1.26611	0.578
29	9.91588	0.8301	1.04252	1.21928	13	9.97178	0.8478	1.26744	0.537
30	9.91644	0.8306	1.05233	1.21393	14	9.97347	0.8451	1.26864	0.4915
31	+9.91713	−0.8299	+1.06182	−1.20839	15	+9.97551	−0.8436	+1.26971	−0.440
Aug. 1	9.91810	0.8283	1.07098	1.20265	16	9.97764	0.8436	1.27065	0.382
2	9.91942	0.8264	1.07984	1.19671	17	9.97964	0.8451	1.27146	0.3148
3	9.92112	0.8246	1.08841	1.19056	18	9.98128	0.8477	1.27215	0.2348
4	9.92313	0.8233	1.09669	1.18420	19	9.98236	0.8506	1.27271	0.1365
h 5	+9.92535	−0.8229	+1.10470	−1.17762	h 20	+9.98295	−0.8533	+1.27314	−0.0089
(21.0) 6	9.92767	0.8236	1.11246	1.17081	(0.0) 21	9.98316	0.8549	1.27345	9.82733
7	9.92996	0.8253	1.11995	1.16377	22	9.98315	0.8552	1.27363	−9.50850
8	9.93207	0.8280	1.12721	1.15648	23	9.98316	0.8542	1.27368	+8.43650
9	9.93384	0.8313	1.13423	1.14895	24	9.98337	0.8520	1.27361	9.57658
10	+9.93521	−0.8349	+1.14102	−1.14115	25	+9.98388	−0.8492	+1.27341	+9.86165
11	9.93614	0.8382	1.14758	1.13309	26	9.98474	0.8461	1.27308	0.03229
12	9.93670	0.8406	1.15393	1.12475	27	9.98592	0.8433	1.27262	0.15444
13	9.93707	0.8417	1.16007	1.11611	28	9.98732	0.8411	1.27204	0.24963
14	9.93746	0.8414	1.16601	1.10717	29	9.98889	0.8398	1.27132	0.32759
15	+9.93811	−0.8397	+1.17175	−1.09792	30	+9.99048	−0.8395	+1.27048	+0.39360
16	+9.93928	−0.8373	+1.17729	−1.08834	Oct. 1	+9.99202	−0.8401	+1.26951	+0.45080

$E = +0''.03 = +0^{s}.002$

FOR WASHINGTON MEAN MIDNIGHT.

ar Day. id. Hr.)		Log A.	Log B.	Log C.	Log D.	Solar Day. (Sid. Hr.)		Log A.	Log B.	Log C.	Log D.
t.	1	+9.99202	−0.8401	+1.26951	+0.45080	Nov.	16	+0.04130	−0.7868	+1.04521	+1.21784
	2	9.99334	0.8415	1.26840	0.50126		17	0.04178	0.7836	1.03458	1.22334
	3	9.99441	0.8434	1.26717	0.54638		18	0.04250	0.7794	1.02354	1.22864
	4	9.99514	0.8452	1.26580	0.58715		19	0.04351	0.7746	1.01207	1.23374
	5	9.99555	0.8465	1.26429	0.62433		20	0.04487	0.7697	1.00015	1.23865
.0)	6	+9.99572	−0.8468	+1.26265	+0.65847	h (4.0)	21	+0.04650	−0.7655	+0.98774	+1.24337
	7	9.99581	0.8458	1.26088	0.69003		22	0.04828	0.7622	0.97483	1.24792
	8	9.99603	0.8433	1.25896	0.71934		23	0.05017	0.7601	0.96138	1.25228
	9	9.99657	0.8397	1.25691	0.74669		24	0.05205	0.7592	0.94735	1.25647
	10	9.99757	0.8355	1.25471	0.77231		25	0.05382	0.7595	0.93270	1.26048
	11	+9.99909	−0.8314	+1.25238	+0.79640		26	+0.05538	−0.7606	+0.91740	+1.26433
	12	0.00100	0.8283	1.24990	0.81910		27	0.05668	0.7622	0.90139	1.26801
	13	0.00312	0.8266	1.24727	0.84057		28	0.05770	0.7635	0.88462	1.27152
	14	0.00514	0.8266	1.24449	0.86091		29	0.05847	0.7641	0.86703	1.27488
	15	0.00690	0.8279	1.24157	0.88022		30	0.05908	0.7634	0.84855	1.27807
	16	+0.00819	−0.8299	+1.23849	+0.89860	Dec.	1	+0.05970	−0.7612	+0.82910	+1.28111
	17	0.00900	0.8318	1.23526	0.91611		2	0.06051	0.7573	0.80858	1.28399
	18	0.00937	0.8329	1.23187	0.93283		3	0.06166	0.7524	0.78689	1.28672
	19	0.00954	0.8326	1.22832	0.94881		4	0.06324	0.7471	0.76391	1.28930
	20	0.00964	0.8310	1.22460	0.96410		5	0.06525	0.7424	0.73949	1.29173
h .0)	21	+0.00989	−0.8280	+1.22072	+0.97876	h (5.0)	6	+0.06756	−0.7391	+0.71347	+1.29400
	22	0.01042	0.8241	1.21667	0.99282		7	0.07000	0.7379	0.68563	1.29614
	23	0.01130	0.8199	1.21245	1.00631		8	0.07229	0.7387	0.65574	1.29812
	24	0.01250	0.8158	1.20806	1.01928		9	0.07427	0.7409	0.62348	1.29996
	25	0.01397	0.8122	1.20348	1.03176		10	0.07581	0.7438	0.58847	1.30166
	26	+0.01560	−0.8096	+1.19872	+1.04376		11	+0.07693	−0.7463	+0.55024	+1.30322
	27	0.01730	0.8080	1.19376	1.05532		12	0.07773	0.7476	0.50815	1.30463
	28	0.01898	0.8074	1.18862	1.06646		13	0.07834	0.7474	0.46139	1.30590
	29	0.02050	0.8078	1.18328	1.07720		14	0.07896	0.7454	0.40882	1.30703
	30	0.02178	0.8088	1.17773	1.08755		15	0.07975	0.7421	0.34882	1.30803
	31	+0.02278	−0.8100	+1.17197	+1.09754		16	+0.08081	−0.7380	+0.27903	+1.30888
Nov.	1	0.02348	0.8109	1.16600	1.10718		17	0.08214	0.7337	0.19565	1.30960
	2	0.02393	0.8108	1.15981	1.11649		18	0.08373	0.7301	0.09217	1.31018
	3	0.02428	0.8094	1.15339	1.12548		19	0.08552	0.7273	9.95586	1.31062
	4	0.02470	0.8065	1.14673	1.13416		20	0.08741	0.7259	9.75584	1.31092
h	5	+0.02538	−0.8022	+1.13983	+1.14255	h (6.0)	21	+0.08929	−0.7258	+9.37345	+1.31108
(3.0)	6	0.02647	0.7971	1.13269	1.15065		22	0.09110	0.7271	−8.98868	1.31111
	7	0.02806	0.7919	1.12528	1.15847		23	0.09270	0.7294	9.63466	1.31100
	8	0.03005	0.7874	1.11760	1.16603		24	0.09410	0.7322	9.88358	1.31076
	9	0.03233	0.7845	1.10965	1.17333		25	0.09522	0.7351	0.04073	1.31037
	10	+0.03461	−0.7833	+1.10141	+1.18038		26	+0.09610	−0.7374	−0.15580	+1.30985
	11	0.03670	0.7838	1.09286	1.18719		27	0.09675	0.7385	0.24657	1.30919
	12	0.03837	0.7854	1.08401	1.19376		28	0.09737	0.7380	0.32150	1.30840
	13	0.03960	0.7873	1.07483	1.20011		29	0.09808	0.7360	0.38528	1.30746
	14	0.04041	0.7885	1.06532	1.20624		30	0.09905	0.7325	0.44077	1.30638
	15	+0.04089	−0.7884	+1.05545	+1.21215		31	+0.10039	−0.7284	−0.48985	+1.30516
	16	+0.04130	−0.7868	+1.04521	+1.21784		32	+0.10212	−0.7247	−0.53382	+1.30380

$E = +0''.03 = +0^s.002$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	L
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Jan.	0	−0.0006	+0.554	+0.001	296 33.8	19 46.3	351 4.3	23 24.3	0.90782	1.31013	−1.38	−0.1
	1	+0.0021	0.567	0.006	297 11.0	19 48.7	350 7.9	23 20.5	0.91166	1.30992	1.52	0.1
	2	0.0048	0.578	0.010	297 40.7	19 50.7	349 11.5	23 16.8	0.91600	1.30969	1.66	0.
	3	0.0076	0.590	0.011	298 1.8	19 52.1	348 15.0	23 13.0	0.92043	1.30943	1.80	0.2
h	4	0.0103	0.602	0.009	298 15.4	19 53.0	347 18.4	23 9.2	0.92433	1.30916	1.94	0.
(7.0)	5	0.0130	+0.614	+0.004	298 24.6	19 53.6	346 21.8	23 5.5	0.92732	1.30886	−2.08	−0.3
	6	0.0158	0.626	−0.002	298 33.1	19 54.2	345 25.0	23 1.7	0.92914	1.30854	2.22	0.3
	7	0.0185	0.638	0.009	298 45.4	19 55.0	344 28.2	22 57.9	0.92980	1.30821	2.36	0.3
	8	0.0213	0.649	0.014	299 5.3	19 56.4	343 31.3	22 54.1	0.92968	1.30786	2.50	0.3
	9	0.0240	0.661	0.016	299 34.4	19 58.3	342 34.3	22 50.3	0.92933	1.30749	2.64	0.4
	10	0.0267	+0.672	−0.015	300 13.1	20 0.9	341 37.2	22 46.5	0.92947	1.30710	−2.77	−0.4
	11	0.0295	0.684	0.010	300 57.5	20 3.8	340 40.0	22 42.7	0.93062	1.30669	2.91	0.4
	12	0.0322	0.695	−0.003	301 42.7	20 6.8	339 42.7	22 38.8	0.93315	1.30626	3.04	0.4
	13	0.0350	0.706	+0.005	302 23.8	20 9.6	338 45.3	22 35.0	0.93698	1.30581	3.18	0.5
	14	0.0377	0.718	0.012	302 56.0	20 11.7	337 47.7	22 31.2	0.94167	1.30535	3.31	0.5
	15	0.0404	+0.729	+0.017	303 18.5	20 13.2	336 50.1	22 27.3	0.94663	1.30488	−3.44	−0.53
	16	0.0432	0.740	0.018	303 31.3	20 14.1	335 52.3	22 23.5	0.95131	1.30439	3.57	0.55
	17	0.0459	0.751	0.016	303 38.1	20 14.5	334 54.4	22 19.6	0.95512	1.30389	3.70	0.5
	18	0.0486	0.762	0.011	303 41.7	20 14.8	333 56.4	22 15.8	0.95796	1.30337	3.83	0.58
	19	0.0514	0.773	+0.005	303 45.8	20 15.1	332 58.3	22 11.9	0.95977	1.30284	3.96	0.5
h	20	0.0541	+0.784	−0.002	303 53.3	20 15.6	331 59.9	22 8.0	0.96076	1.30230	−4.08	−0.6
(8.0)	21	0.0569	0.795	0.007	304 5.8	20 16.4	331 1.5	22 4.1	0.96120	1.30174	4.21	0.62
	22	0.0596	0.805	0.011	304 24.1	20 17.6	330 3.0	22 0.2	0.96148	1.30117	4.33	0.63
	23	0.0623	0.816	0.013	304 47.6	20 19.2	329 4.3	21 56.3	0.96195	1.30059	4.45	0.64
	24	0.0651	0.826	0.012	305 15.0	20 21.0	328 5.4	21 52.4	0.96289	1.30000	4.57	0.660
	25	0.0678	+0.836	−0.010	305 44.6	20 23.0	327 6.5	21 48.4	0.96450	1.29939	−4.69	−0.6715
	26	0.0706	0.847	−0.006	306 14.2	20 24.9	326 7.4	21 44.5	0.96694	1.29878	4.81	0.6822
	27	0.0733	0.857	0.000	306 41.1	20 26.7	325 8.1	21 40.5	0.97018	1.29816	4.93	0.6926
	28	0.0760	0.867	+0.005	307 3.5	20 28.2	324 8.6	21 36.6	0.97407	1.29754	5.04	0.7025
	29	0.0788	0.877	0.009	307 19.7	20 29.3	323 9.1	21 32.6	0.97836	1.29690	5.15	0.7121
	30	0.0815	+0.887	+0.011	307 29.0	20 29.9	322 9.3	21 28.6	0.98263	1.29626	−5.26	−0.7214
	31	0.0842	0.897	0.010	307 32.1	20 30.1	321 9.4	21 24.6	0.98645	1.29562	5.37	0.7303
Feb.	1	0.0870	0.906	0.007	307 31.5	20 30.1	320 9.4	21 20.6	0.98947	1.29496	5.48	0.7389
	2	0.0897	0.916	+0.001	307 30.3	20 30.0	319 9.1	21 16.6	0.99146	1.29431	5.59	0.7472
	3	0.0924	0.925	−0.006	307 32.6	20 30.2	318 8.8	21 12.6	0.99246	1.29365	5.69	0.7552
h	4	0.0952	+0.935	−0.012	307 41.1	20 30.7	317 8.2	21 8.5	0.99272	1.29299	−5.79	−0.7629
(9.0)	5	0.0979	0.944	0.015	307 57.8	20 31.9	316 7.5	21 4.5	0.99271	1.29232	5.89	0.7704
	6	0.1007	0.953	0.015	308 22.3	20 33.5	315 6.5	21 0.4	0.99301	1.29167	5.99	0.7776
	7	0.1034	0.962	0.012	308 52.2	20 35.5	314 5.5	20 56.4	0.99412	1.29101	6.09	0.7845
	8	0.1061	0.971	−0.005	309 23.1	20 37.5	313 4.2	20 52.3	0.99631	1.29034	6.18	0.7912
	9	0.1089	+0.980	+0.003	309 50.8	20 39.4	312 2.8	20 48.2	0.99956	1.28968	−6.28	−0.7977
	10	0.1116	0.989	0.010	310 11.5	20 40.8	311 1.2	20 44.1	1.00356	1.28902	6.37	0.8039
	11	0.1144	0.997	0.016	310 23.6	20 41.6	309 59.4	20 40.0	1.00781	1.28836	6.46	0.8100
	12	0.1171	1.006	0.018	310 27.8	20 41.9	308 57.6	20 35.9	1.01178	1.28772	6.54	0.8157
	13	0.1198	1.015	0.016	310 26.4	20 41.8	307 55.5	20 31.7	1.01508	1.28708	6.63	0.8213
	14	0.1226	+1.023	+0.012	310 22.5	20 41.5	306 53.3	20 27.6	1.01748	1.28645	−6.71	−0.8267
	15	0.1253	+1.031	+0.007	310 19.5	20 41.3	305 50.9	20 23.4	1.01898	1.28581	−6.79	−0.8319

FOR WASHINGTON MEAN MIDNIGHT.

Day. ereal ar.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
. 15	0.1253	+1.031	+0.007	310 19.5	20 41.3	305 50.9	20 23.4	1.01898	1.28581	−6.79	−0.8319
16	0.1280	1.040	0.000	310 19.4	20 41.3	304 48.3	20 19.2	1.01967	1.28519	6.87	0.8368
17	0.1308	1.048	−0.006	310 24.3	20 41.6	303 45.6	20 15.0	1.01987	1.28456	6.94	0.8416
18	0.1335	1.056	0.010	310 34.5	20 42.3	302 42.7	20 10.8	1.01985	1.28396	7.02	0.8462
19	0.1363	1.064	0.013	310 49.4	20 43.3	301 39.8	20 6.6	1.01995	1.28336	7.09	0.8506
h .0)20	0.1390	+1.071	−0.013	311 8.1	20 44.5	300 36.7	20 2.4	1.02042	1.28279	−7.16	−0.8549
21	0.1417	1.079	0.011	311 28.6	20 45.9	299 33.4	19 58.2	1.02146	1.28222	7.23	0.8589
22	0.1445	1.087	0.007	311 49.3	20 47.3	298 30.1	19 54.0	1.02312	1.28166	7.29	0.8628
23	0.1472	1.095	−0.002	312 8.4	20 48.6	297 26.5	19 49.8	1.02548	1.28111	7.35	0.8665
24	0.1500	1.102	+0.003	312 23.8	20 49.6	296 22.9	19 45.5	1.02842	1.28058	7.42	0.8701
25	0.1527	+1.110	+0.008	312 34.2	20 50.3	295 19.1	19 41.3	1.03167	1.28006	−7.47	−0.8735
26	0.1554	1.117	0.010	312 38.7	20 50.6	294 15.3	19 37.0	1.03496	1.27957	7.53	0.8767
27	0.1582	1.124	0.010	312 38.2	20 50.5	293 11.3	19 32.8	1.03792	1.27909	7.58	0.8798
28	0.1609	1.131	0.008	312 34.5	20 50.3	292 7.2	19 28.5	1.04025	1.27861	7.63	0.8827
r. 1	0.1636	1.139	+0.003	312 30.1	20 50.0	291 3.0	19 24.2	1.04171	1.27816	7.68	0.8854
2	0.1664	+1.146	−0.003	312 28.5	20 49.9	289 58.7	19 19.9	1.04228	1.27773	−7.73	−0.8880
3	0.1691	1.153	0.009	312 32.4	20 50.2	288 54.3	19 15.6	1.04217	1.27732	7.77	0.8905
4	0.1718	1.160	0.014	312 43.6	20 50.9	287 49.8	19 11.3	1.04170	1.27693	7.81	0.8928
5	0.1746	1.167	0.015	313 2.1	20 52.1	286 45.2	19 7.0	1.04140	1.27656	7.85	0.8950
6	0.1773	1.174	0.012	313 26.0	20 53.7	285 40.6	19 2.7	1.04174	1.27621	7.89	0.8970
h 1.0) 7	0.1801	+1.181	−0.007	313 51.9	20 55.5	284 35.9	18 58.4	1.04296	1.27588	−7.92	−0.8989
8	0.1828	1.188	+0.001	314 15.6	20 57.0	283 31.1	18 54.1	1.04516	1.27557	7.96	0.9006
9	0.1855	1.194	0.009	314 33.6	20 58.2	282 26.3	18 49.8	1.04808	1.27529	7.98	0.9022
10	0.1883	1.201	0.015	314 44.4	20 59.0	281 21.4	18 45.4	1.05130	1.27502	8.01	0.9037
11	0.1910	1.208	0.018	314 47.8	20 59.2	280 16.4	18 41.1	1.05438	1.27478	8.04	0.9050
12	0.1938	+1.214	+0.018	314 45.8	20 59.1	279 11.5	18 36.8	1.05690	1.27456	−8.06	−0.9062
13	0.1965	1.221	0.014	314 41.3	20 58.7	278 6.5	18 32.4	1.05862	1.27436	8.08	0.9073
14	0.1992	1.228	0.008	314 37.2	20 58.5	277 1.4	18 28.1	1.05947	1.27419	8.09	0.9082
15	0.2020	1.234	+0.002	314 36.2	20 58.4	275 56.4	18 23.8	1.05963	1.27406	8.11	0.9090
16	0.2047	1.241	−0.004	314 40.0	20 58.7	274 51.4	18 19.4	1.05927	1.27394	8.12	0.9096
17	0.2074	+1.248	−0.009	314 48.7	20 59.2	273 46.3	18 15.1	1.05869	1.27383	−8.13	−0.9102
18	0.2102	1.254	0.012	315 2.5	21 0.2	272 41.3	18 10.8	1.05821	1.27376	8.14	0.9106
19	0.2129	1.261	0.013	315 20.1	21 1.3	271 36.3	18 6.4	1.05802	1.27371	8.14	0.9108
20	0.2156	1.267	0.012	315 39.7	21 2.6	270 31.3	18 2.1	1.05834	1.27369	8.15	0.9109
21	0.2184	1.274	0.009	315 59.7	21 4.0	269 26.4	17 57.8	1.05926	1.27368	8.15	0.9109
h (12.0)22	0.2211	+1.280	−0.004	316 18.5	21 5.2	268 21.5	17 53.4	1.06075	1.27371	−8.14	−0.9108
23	0.2239	1.287	+0.001	316 34.1	21 6.3	267 16.6	17 49.1	1.06280	1.27376	8.14	0.9105
24	0.2266	1.293	0.006	316 45.4	21 7.0	266 11.9	17 44.8	1.06518	1.27383	8.13	0.9101
25	0.2293	1.300	0.009	316 52.0	21 7.5	265 7.2	17 40.5	1.06769	1.27393	8.12	0.9096
26	0.2321	1.306	0.010	316 53.8	21 7.6	264 2.6	17 36.2	1.06996	1.27405	8.11	0.9090
27	0.2348	+1.313	+0.008	316 52.5	21 7.5	262 58.0	17 31.9	1.07175	1.27420	−8.09	−0.9082
28	0.2376	1.320	+0.004	316 50.5	21 7.4	261 53.5	17 27.6	1.07279	1.27436	8.08	0.9073
29	0.2403	1.326	−0.002	316 50.4	21 7.4	260 49.2	17 23.3	1.07303	1.27455	8.06	0.9062
30	0.2430	1.333	0.008	316 55.5	21 7.7	259 44.9	17 19.0	1.07263	1.27478	8.04	0.9050
31	0.2458	1.340	0.013	317 7.3	21 8.5	258 40.7	17 14.7	1.07190	1.27502	8.01	0.9038
Apr. 1	0.2485	+1.346	−0.015	317 26.4	21 9.8	257 36.7	17 10.4	1.07125	1.27527	−7.99	−0.9023
2	0.2512	+1.353	−0.013	317 51.2	21 11.4	256 32.7	17 6.2	1.07112	1.27555	−7.96	−0.9007

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f	f′	G		H		Log g.	Log h.	i	Lo
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
Apr. 1	0.2485	+1.346	−0.015	317 26.4	21 9.8	257 36.7	17 10.4	1.07125	1.27527	−7.99	−0.90
2	0.2512	1.353	0.013	317 51.2	21 11.4	256 32.7	17 6.2	1.07112	1.27555	7.96	0.90
3	0.2540	1.360	0.008	318 18.5	21 13.2	255 28.9	17 1.9	1.07182	1.27585	7.93	0.89
4	0.2567	1.367	−0.001	318 44.5	21 15.0	254 25.2	16 57.7	1.07339	1.27618	7.89	0.89
5	0.2595	1.374	+0.007	319 5.7	21 16.4	253 21.6	16 53.4	1.07573	1.27652	7.86	0.89
h 6	0.2622	+1.381	+0.014	319 20.4	21 17.4	252 18.2	16 49.2	1.07846	1.27688	−7.82	−0.89
(13.0) 7	0.2649	1.388	0.018	319 27.9	21 17.9	251 14.9	16 45.0	1.08113	1.27726	7.78	0.89
8	0.2677	1.395	0.019	319 29.8	21 18.0	250 11.7	16 40.8	1.08332	1.27766	7.74	0.88
9	0.2704	1.402	0.016	319 28.7	21 17.9	249 8.7	16 36.6	1.08479	1.27808	7.69	0.88
10	0.2732	1.409	0.011	319 27.9	21 17.9	248 5.8	16 32.4	1.08548	1.27852	7.64	0.88
11	0.2759	+1.416	+0.004	319 29.5	21 18.0	247 3.2	16 28.2	1.08547	1.27897	−7.59	−0.88
12	0.2786	1.423	−0.002	319 36.0	21 18.4	246 0.7	16 24.0	1.08500	1.27944	7.54	0.87
13	0.2814	1.431	0.008	319 47.5	21 19.2	244 58.3	16 19.9	1.08429	1.27992	7.49	0.87
14	0.2841	1.438	0.012	320 4.0	21 20.3	243 56.1	16 15.7	1.08366	1.28042	7.43	0.87
15	0.2868	1.445	0.013	320 24.3	21 21.6	242 54.1	16 11.6	1.08338	1.28094	7.37	0.86
16	0.2896	+1.453	−0.012	320 46.7	21 23.1	241 52.3	16 7.5	1.08354	1.28146	−7.31	−0.
17	0.2923	1.460	0.010	321 9.2	21 24.6	240 50.7	16 3.4	1.08431	1.28200	7.25	0.86
18	0.2950	1.468	−0.005	321 31.4	21 26.1	239 49.2	15 59.3	1.08562	1.28255	7.19	0.85
19	0.2978	1.476	0.000	321 50.1	21 27.3	238 48.0	15 55.2	1.08744	1.28311	7.12	0.85
20	0.3005	1.484	+0.004	322 4.8	21 28.3	237 47.0	15 51.1	1.08964	1.28368	7.05	0.84
h 21	0.3033	+1.492	+0.008	322 15.0	21 29.0	236 46.1	15 47.1	1.09194	1.28426	−6.98	−0.84
(14.0) 22	0.3060	1.499	0.009	322 20.6	21 29.4	235 45.5	15 43.0	1.09413	1.28485	6.91	0.84
23	0.3087	1.508	0.008	322 22.7	21 29.5	234 45.0	15 39.0	1.09589	1.28545	6.84	0.83
24	0.3115	1.516	+0.004	322 24.4	21 29.6	233 44.8	15 35.0	1.09702	1.28606	6.76	0.82
25	0.3142	1.524	−0.001	322 27.4	21 29.8	232 44.8	15 31.0	1.09747	1.28667	6.68	0.81
26	0.3170	+1.532	−0.007	322 35.0	21 30.3	231 45.0	15 27.0	1.09736	1.28728	−6.60	−0.81
27	0.3197	1.540	0.013	322 48.7	21 31.2	230 45.3	15 23.0	1.09689	1.28791	6.52	0.81
28	0.3224	1.549	0.016	323 9.3	21 32.6	229 45.9	15 19.1	1.09651	1.28853	6.44	0.80
29	0.3252	1.557	0.015	323 35.7	21 34.4	228 46.7	15 15.1	1.09660	1.28915	6.35	0.8027
30	0.3279	1.566	0.011	324 5.0	21 36.3	227 47.7	15 11.2	1.09746	1.28978	6.26	0.7967
May 1	0.3306	+1.575	−0.004	324 33.2	21 38.1	226 48.9	15 7.3	1.09925	1.29041	−6.17	−0.7905
2	0.3334	1.583	+0.004	324 58.0	21 39.9	225 50.3	15 3.4	1.10171	1.29104	6.08	0.7841
3	0.3361	1.592	0.012	325 15.9	21 41.1	224 51.8	14 59.5	1.10462	1.29168	5.99	0.7774
4	0.3389	1.601	0.018	325 27.0	21 41.8	223 53.6	14 55.6	1.10756	1.29232	5.90	0.7705
5	0.3416	1.610	0.020	325 32.2	21 42.1	222 55.6	14 51.7	1.11006	1.29295	5.80	0.7634
h 6	0.3443	+1.619	+0.018	325 34.1	21 42.3	221 57.7	14 47.8	1.11193	1.29358	−5.70	−0.7560
(15.0) 7	0.3471	1.628	0.014	325 35.7	21 42.4	221 0.1	14 44.0	1.11303	1.29421	5.60	0.7484
8	0.3498	1.638	+0.007	325 39.5	21 42.6	220 2.6	14 40.2	1.11348	1.29483	5.50	0.7406
9	0.3526	1.647	0.000	325 47.5	21 43.2	219 5.3	14 36.4	1.11345	1.29545	5.40	0.7324
10	0.3553	1.656	−0.006	326 0.5	21 44.0	218 8.2	14 32.5	1.11321	1.29607	5.30	0.7240
11	0.3580	+1.666	−0.010	326 18.2	21 45.2	217 11.3	14 28.8	1.11307	1.29668	−5.19	−0.7153
12	0.3608	1.676	0.012	326 39.5	21 46.6	216 14.6	14 25.0	1.11324	1.29729	5.08	0.7063
13	0.3635	1.685	0.012	327 2.8	21 48.2	215 18.1	14 21.2	1.11390	1.29789	4.98	0.6970
14	0.3662	1.695	0.010	327 26.3	21 49.7	214 21.7	14 17.4	1.11508	1.29848	4.87	0.6874
15	0.3690	1.705	0.006	327 48.4	21 51.2	213 25.6	14 13.7	1.11682	1.29907	4.76	0.6774
16	0.3717	+1.715	−0.001	328 7.6	21 52.5	212 29.5	14 10.0	1.11901	1.29964	−4.65	−0.6670
17	0.3744	+1.725	+0.003	328 22.8	21 53.5	211 33.7	14 6.2	1.12152	1.30021	−4.53	−0.6563

FOR WASHINGTON MEAN MIDNIGHT.

r Day. dereal our.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
y 17	0.3744	+1.725	+0.003	328 22.8	21 53.5	211 33.7	14 6.2	1.12152	1.30021	−4.53	−0.6563
18	0.3772	1.735	0.007	328 33.6	21 54.2	210 38.0	14 2.5	1.12415	1.30077	4.42	0.6452
19	0.3799	1.745	0.009	328 40.1	21 54.7	209 42.5	13 58.8	1.12665	1.30131	4.30	0.6337
20	0.3827	1.755	0.009	328 43.2	21 54.9	208 47.2	13 55.1	1.12882	1.30185	4.18	0.6218
h 21	0.3854	1.766	+0.005	328 45.1	21 55.0	207 52.0	13 51.5	1.13047	1.30238	4.07	0.6093
.0)22	0.3881	+1.776	0.000	328 48.1	21 55.2	206 57.0	13 47.8	1.13149	1.30289	−3.95	−0.5964
23	0.3909	1.786	−0.006	328 54.8	21 55.7	206 2.1	13 44.1	1.13200	1.30339	3.83	0.5830
24	0.3936	1.797	0.012	329 6.7	21 56.4	205 7.4	13 40.5	1.13218	1.30388	3.71	0.5691
25	0.3964	1.808	0.016	329 25.0	21 57.7	204 12.8	13 36.9	1.13242	1.30435	3.58	0.5546
26	0.3991	1.818	0.017	329 48.7	21 59.2	203 18.4	13 33.2	1.13308	1.30482	3.46	0.5394
27	0.4018	+1.829	−0.014	330 15.3	22 1.0	202 24.1	13 29.6	1.13444	1.30527	−3.34	−0.5236
28	0.4046	1.840	−0.008	330 41.6	22 2.8	201 29.9	13 26.0	1.13661	1.30570	3.21	0.5070
29	0.4073	1.850	+0.001	331 4.2	22 4.3	200 35.9	13 22.4	1.13951	1.30613	3.09	0.4897
30	0.4100	1.861	0.009	331 21.0	22 5.4	199 41.9	13 18.8	1.14283	1.30653	2.96	0.4715
31	0.4128	1.872	0.016	331 31.2	22 6.1	198 48.1	13 15.2	1.14620	1.30691	2.83	0.4524
ne 1	0.4155	+1.883	+0.019	331 35.6	22 6.4	197 54.4	13 11.6	1.14922	1.30729	−2.71	−0.4324
2	0.4183	1.894	0.019	331 36.6	22 6.4	197 0.8	13 8.1	1.15166	1.30764	2.58	0.4112
3	0.4210	1.906	0.016	331 36.9	22 6.5	196 7.3	13 4.5	1.15339	1.30799	2.45	0.3888
4	0.4237	1.917	0.010	331 38.8	22 6.6	195 13.9	13 0.9	1.15448	1.30832	2.32	0.3651
h 5	0.4265	1.928	+0.003	331 44.4	22 7.0	194 20.5	12 57.4	1.15509	1.30863	2.19	0.3399
7.0) 6	0.4292	+1.939	−0.003	331 54.4	22 7.6	193 27.3	12 53.8	1.15550	1.30892	−2.06	−0.3130
7	0.4320	1.950	0.008	332 8.6	22 8.6	192 34.1	12 50.3	1.15596	1.30919	1.92	0.2842
8	0.4347	1.962	0.011	332 26.1	22 9.7	191 41.1	12 46.7	1.15667	1.30945	1.79	0.2532
9	0.4374	1.973	0.011	332 45.4	22 11.0	190 48.0	12 43.2	1.15782	1.30969	1.66	0.2197
10	0.4402	1.984	0.010	333 4.6	22 12.3	189 55.1	12 39.7	1.15943	1.30991	1.52	0.1833
11	0.4429	+1.996	−0.007	333 22.6	22 13.5	189 2.2	12 36.1	1.16152	1.31011	−1.39	−0.1435
12	0.4456	2.007	−0.002	333 38.0	22 14.5	188 9.4	12 32.6	1.16403	1.31030	1.26	0.0995
13	0.4484	2.019	+0.003	333 49.7	22 15.3	187 16.6	12 29.1	1.16678	1.31047	1.12	0.0504
14	0.4511	2.030	0.007	333 57.3	22 15.8	186 23.9	12 25.6	1.16965	1.31062	0.99	9.9949
15	0.4538	2.042	0.009	334 0.9	22 16.1	185 31.2	12 22.1	1.17243	1.31074	0.85	9.9311
16	0.4566	+2.053	+0.010	334 1.2	22 16.1	184 38.5	12 18.6	1.17491	1.31086	−0.72	−9.8563
17	0.4593	2.065	0.007	334 0.1	22 16.0	183 45.9	12 15.1	1.17689	1.31095	0.58	9.7656
18	0.4621	2.076	+0.002	333 59.5	22 16.0	182 53.4	12 11.6	1.17833	1.31101	0.45	9.6508
19	0.4648	2.088	−0.004	334 1.4	22 16.1	182 0.8	12 8.1	1.17928	1.31106	0.31	9.4941
20	0.4675	2.099	0.010	334 8.1	22 16.5	181 8.3	12 4.6	1.17993	1.31110	0.18	9.2464
h 21	0.4703	+2.111	−0.016	334 20.1	22 17.3	180 15.8	12 1.1	1.18054	1.31111	−0.04	−8.6101
18.0)22	0.4730	2.122	0.018	334 36.9	22 18.5	179 23.3	11 57.6	1.18147	1.31111	+0.10	+8.9770
23	0.4758	2.134	0.016	334 56.8	22 19.8	178 30.8	11 54.1	1.18298	1.31110	0.23	9.3625
24	0.4785	2.145	0.011	335 16.8	22 21.1	177 38.3	11 50.6	1.18520	1.31105	0.37	9.5633
25	0.4812	2.157	−0.003	335 34.2	22 22.3	176 45.8	11 47.1	1.18808	1.31099	0.50	9.7000
26	0.4840	+2.169	+0.005	335 46.5	22 23.1	175 53.3	11 43.6	1.19137	1.31091	+0.64	+9.8037
27	0.4867	2.180	0.013	335 53.1	22 23.5	175 0.8	11 40.1	1.19479	1.31081	0.77	9.8873
28	0.4894	2.192	0.018	335 54.3	22 23.6	174 8.2	11 36.5	1.19797	1.31070	0.91	9.9572
29	0.4922	2.203	0.019	335 51.8	22 23.5	173 15.6	11 33.0	1.20060	1.31056	1.04	0.0173
30	0.4949	2.214	0.017	335 48.3	22 23.2	172 23.0	11 29.5	1.20263	1.31040	1.18	0.0700
July 1	0.4977	+2.226	+0.012	335 46.0	22 23.1	171 30.4	11 26.0	1.20404	1.31023	+1.31	+0.1169
2	0.5004	+2.237	+0.005	335 46.6	22 23.1	170 37.7	11 22.5	1.20496	1.31004	+1.44	+0.1[illegible]

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f	f′	G		H		Log g.	Log h.	i	Log
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
July 1	0.4977	+2.226	+0.012	335 46.0	22 23.1	171 30.4	11 26.0	1.20404	1.31023	+1.31	+0.1
2	0.5004	2.237	+0.005	335 46.6	22 23.1	170 37.7	11 22.5	1.20496	1.31004	1.44	0.1
3	0.5031	2.249	−0.001	335 51.1	22 23.4	169 44.9	11 19.0	1.20564	1.30983	1.58	0.19
4	0.5059	2.260	0.006	335 59.6	22 24.0	168 52.1	11 15.5	1.20631	1.30960	1.71	0.23
5	0.5086	2.271	0.010	336 11.1	22 24.7	167 59.2	11 11.9	1.20716	1.30936	1.84	0.26
h 6	0.5114	+2.283	−0.011	336 24.5	22 25.6	167 6.3	11 8.4	1.20839	1.30909	+1.97	+0.29
(19.0) 7	0.5141	2.294	0.010	336 38.1	22 26.5	166 13.3	11 4.9	1.20997	1.30881	2.10	0.3
8	0.5168	2.305	0.007	336 50.5	22 27.4	165 20.2	11 1.3	1.21198	1.30852	2.23	0.3
9	0.5196	2.316	−0.003	337 0.7	22 28.0	164 27.0	10 57.8	1.21433	1.30820	2.36	0.37
10	0.5223	2.327	+0.002	337 7.9	22 28.5	163 33.7	10 54.2	1.21692	1.30787	2.49	0.39
11	0.5250	+2.338	+0.006	337 11.4	22 28.8	162 40.4	10 50.7	1.21959	1.30752	+2.62	+0.4
12	0.5278	2.349	0.009	337 11.4	22 28.8	161 47.0	10 47.1	1.22222	1.30716	2.75	0.43
13	0.5305	2.360	0.010	337 8.5	22 28.6	160 53.5	10 43.6	1.22457	1.30679	2.88	0.45
14	0.5332	2.371	0.009	337 3.9	22 28.3	159 59.8	10 40.0	1.22654	1.30639	3.00	0.47
15	0.5360	2.382	+0.005	336 59.3	22 28.0	159 6.1	10 36.4	1.22802	1.30598	3.13	0.49
16	0.5387	+2.393	−0.001	336 56.7	22 27.8	158 12.3	10 32.8	1.22905	1.30555	+3.26	+0.51
17	0.5415	2.404	0.008	336 57.9	22 27.9	157 18.3	10 29.2	1.22972	1.30511	3.38	0.5
18	0.5442	2.414	0.014	337 3.4	22 28.2	156 24.3	10 25.6	1.23028	1.30466	3.50	0.54
19	0.5469	2.425	0.017	337 13.5	22 28.9	155 30.1	10 22.0	1.23102	1.30420	3.62	0.55
20	0.5497	2.435	0.017	337 26.9	22 29.8	154 35.8	10 18.4	1.23222	1.30373	3.74	0.57
h 21	0.5524	+2.446	−0.013	337 41.1	22 30.7	153 41.4	10 14.8	1.23400	1.30324	+3.86	+0.5
(20.0) 22	0.5552	2.457	−0.007	337 53.6	22 31.6	152 46.9	10 11.1	1.23638	1.30274	3.98	0.6
23	0.5579	2.466	+0.002	338 2.3	22 32.2	151 52.2	10 7.5	1.23921	1.30222	4.10	0.61
24	0.5606	2.476	0.009	338 5.8	22 32.4	150 57.4	10 3.8	1.24220	1.30169	4.22	0.62
25	0.5634	2.487	0.015	338 4.4	22 32.3	150 2.4	10 0.2	1.24501	1.30116	4.33	0.63
26	0.5661	+2.497	+0.018	337 59.6	22 32.0	149 7.3	9 56.5	1.24749	1.30061	+4.45	+0.64
27	0.5688	2.507	0.017	337 52.9	22 31.5	148 12.0	9 52.8	1.24939	1.30006	4.56	0.659
28	0.5716	2.517	0.013	337 47.2	22 31.1	147 16.6	9 49.1	1.25071	1.29949	4.67	0.669
29	0.5743	2.527	+0.007	337 44.0	22 30.9	146 21.0	9 45.4	1.25156	1.29892	4.78	0.679
30	0.5771	2.536	0.000	337 44.2	22 31.0	145 25.3	9 41.7	1.25211	1.29834	4.89	0.6896
31	0.5798	+2.546	−0.005	337 48.1	22 31.2	144 29.4	9 38.0	1.25259	1.29775	+5.00	+0.6991
Aug. 1	0.5825	2.556	0.009	337 55.2	22 31.7	143 33.3	9 34.2	1.25320	1.29716	5.11	0.7081
2	0.5853	2.565	0.011	338 4.1	22 32.3	142 37.1	9 30.5	1.25406	1.29656	5.21	0.7171
3	0.5880	2.575	0.010	338 13.7	22 32.9	141 40.6	9 26.7	1.25528	1.29595	5.32	0.7257
4	0.5908	2.584	0.008	338 22.6	22 33.5	140 44.0	9 22.9	1.25684	1.29534	5.42	0.7340
h 5	0.5935	+2.594	−0.004	338 29.6	22 34.0	139 47.2	9 19.1	1.25871	1.29472	+5.52	+0.7420
(21.0) 6	0.5962	2.603	+0.001	338 34.1	22 34.3	138 50.2	9 15.3	1.26081	1.29410	5.62	0.7497
7	0.5990	2.612	0.005	338 35.7	22 34.4	137 53.1	9 11.5	1.26302	1.29347	5.72	0.7572
8	0.6017	2.621	0.009	338 34.1	22 34.3	136 55.8	9 7.7	1.26521	1.29284	5.81	0.7645
9	0.6044	2.630	0.011	338 29.9	22 34.0	135 58.2	9 3.9	1.26718	1.29223	5.91	0.7715
10	0.6072	+2.639	+0.010	338 23.8	22 33.6	135 0.5	9 0.0	1.26886	1.29160	+6.00	+0.7783
11	0.6099	2.647	0.007	338 17.4	22 33.2	134 2.7	8 56.2	1.27011	1.29097	6.09	0.7848
12	0.6126	2.656	+0.002	338 12.4	22 32.8	133 4.6	8 52.3	1.27092	1.29034	6.18	0.7912
13	0.6153	2.665	−0.005	338 10.4	22 32.7	132 6.3	8 48.4	1.27140	1.28971	6.27	0.7973
14	0.6181	2.673	0.011	338 12.4	22 32.8	131 7.8	8 44.5	1.27168	1.28909	6.36	0.8033
15	0.6209	+2.682	−0.015	338 18.6	22 33.2	130 9.2	8 40.6	1.27202	1.28847	+6.44	+0.8090
16	0.6236	+2.690	−0.017	338 28.3	22 33.9	129 10.4	8 36.7	1.27270	1.28785	+6.52	+0.8146

FOR WASHINGTON MEAN MIDNIGHT.

ar Day. idereal our.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
g. 16	0.6236	+2.690	−0.017	338 28.3	22 33.9	129 10.4	8 36.7	1.27270	1.28785	+6.52	+0.8146
17	0.6263	2.698	0.014	338 39.3	22 34.6	128 11.4	8 32.8	1.27386	1.28725	6.61	0.8199
18	0.6291	2.707	0.009	338 49.9	22 35.3	127 12.2	8 28.8	1.27556	1.28664	6.68	0.8251
19	0.6318	2.715	−0.001	338 57.4	22 35.8	126 12.8	8 24.8	1.27769	1.28603	6.76	0.8301
20	0.6346	2.723	+0.007	339 0.8	22 36.1	125 13.2	8 20.9	1.28011	1.28543	6.84	0.8349
h 21	0.6373	+2.731	+0.013	338 59.5	22 36.0	124 13.5	8 16.9	1.28246	1.28484	+6.91	+0.8395
.0)22	0.6400	2.739	0.017	338 54.6	22 35.6	123 13.6	8 12.9	1.28450	1.28426	6.98	0.8440
23	0.6428	2.746	0.017	338 47.6	22 35.2	122 13.5	8 8.9	1.28606	1.28369	7.05	0.8483
24	0.6455	2.754	0.014	338 41.0	22 34.7	121 13.2	8 4.9	1.28712	1.28312	7.12	0.8524
25	0.6482	2.762	0.008	338 36.2	22 34.4	120 12.7	8 0.8	1.28769	1.28257	7.18	0.8564
26	0.6510	+2.769	+0.002	338 34.7	22 34.3	119 12.0	7 56.8	1.28794	1.28202	+7.25	+0.8603
27	0.6537	2.777	−0.004	338 36.8	22 34.5	118 11.2	7 52.7	1.28808	1.28149	7.31	0.8639
28	0.6565	2.784	0.009	338 42.1	22 34.8	117 10.2	7 48.7	1.28829	1.28097	7.37	0.8675
29	0.6592	2.792	0.011	338 49.6	22 35.3	116 9.0	7 44.6	1.28872	1.28047	7.43	0.8708
30	0.6619	2.799	0.011	338 58.2	22 35.9	115 7.7	7 40.5	1.28944	1.27997	7.48	0.8741
31	0.6647	+2.806	−0.009	339 6.4	22 36.4	114 6.1	7 36.4	1.29048	1.27950	+7.54	+0.8772
pt. 1	0.6674	2.814	0.006	339 13.3	22 36.9	113 4.4	7 32.3	1.29181	1.27903	7.59	0.8801
2	0.6702	2.821	−0.001	339 18.1	22 37.2	112 2.5	7 28.2	1.29337	1.27857	7.64	0.8829
3	0.6729	2.828	+0.004	339 20.3	22 37.3	111 0.5	7 24.0	1.29508	1.27814	7.68	0.8855
4	0.6756	2.835	0.008	339 19.7	22 37.2	109 58.4	7 19.9	1.29676	1.27773	7.73	0.8881
h 5	0.6784	+2.842	+0.010	339 16.6	22 37.1	108 56.0	7 15.7	1.29835	1.27733	+7.77	+0.8904
.0) 6	0.6811	2.849	0.010	339 11.8	22 36.8	107 53.5	7 11.6	1.29968	1.27695	7.81	0.8927
7	0.6838	2.855	0.008	339 6.3	22 36.4	106 50.9	7 7.4	1.30064	1.27659	7.85	0.8948
8	0.6866	2.862	+0.004	339 1.8	22 36.1	105 48.2	7 3.2	1.30123	1.27625	7.88	0.8968
9	0.6893	2.869	−0.003	338 59.6	22 36.0	104 45.3	6 59.0	1.30146	1.27593	7.92	0.8986
10	0.6920	+2.876	−0.009	339 1.0	22 36.1	103 42.3	6 54.8	1.30147	1.27563	+7.95	+0.9004
11	0.6948	2.882	0.014	339 6.5	22 36.4	102 39.1	6 50.6	1.30149	1.27534	7.98	0.9019
12	0.6975	2.889	0.016	339 15.5	22 37.0	101 35.9	6 46.4	1.30172	1.27507	8.00	0.9034
13	0.7003	2.896	0.015	339 26.8	22 37.8	100 32.6	6 42.2	1.30236	1.27483	8.03	0.9047
14	0.7030	2.902	0.010	339 38.1	22 38.5	99 29.2	6 38.0	1.30353	1.27462	8.05	0.9059
15	0.7057	+2.909	−0.003	339 47.2	22 39.1	98 25.6	6 33.7	1.30514	1.27442	+8.07	+0.9070
16	0.7085	2.915	+0.005	339 52.7	22 39.5	97 22.0	6 29.5	1.30701	1.27425	8.09	0.9079
17	0.7112	2.922	0.012	339 54.0	22 39.6	96 18.4	6 25.2	1.30895	1.27410	8.11	0.9088
18	0.7140	2.928	0.016	339 51.6	22 39.4	95 14.6	6 21.0	1.31070	1.27397	8.12	0.9094
19	0.7167	2.935	0.017	339 46.7	22 39.1	94 10.8	6 16.7	1.31201	1.27387	8.13	0.9100
h 20	0.7194	+2.941	+0.015	339 41.5	22 38.8	93 6.9	6 12.5	1.31284	1.27379	+8.14	+0.9104
(0.0) 21	0.7222	2.948	0.010	339 37.8	22 38.5	92 3.0	6 8.2	1.31323	1.27373	8.14	0.9107
22	0.7249	2.954	+0.003	339 36.9	22 38.5	90 59.0	6 3.9	1.31325	1.27369	8.15	0.9109
23	0.7276	2.960	−0.003	339 39.7	22 38.6	89 55.0	5 59.7	1.31314	1.27368	8.15	0.9109
24	0.7304	2.967	0.008	339 45.7	22 39.0	88 50.9	5 55.4	1.31307	1.27370	8.14	0.9109
25	0.7331	+2.973	−0.011	339 54.4	22 39.6	87 46.9	5 51.1	1.31317	1.27374	+8.14	+0.9107
26	0.7359	2.980	0.012	340 4.3	22 40.3	86 42.8	5 46.8	1.31358	1.27379	8.14	0.9104
27	0.7386	2.986	0.010	340 14.4	22 41.0	85 38.6	5 42.6	1.31429	1.27387	8.13	0.9099
28	0.7413	2.993	0.007	340 23.4	22 41.6	84 34.5	5 38.3	1.31529	1.27398	8.12	0.9093
29	0.7441	2.999	−0.002	340 30.6	22 42.0	83 30.3	5 34.0	1.31654	1.27412	8.10	0.9086
30	0.7468	+3.006	+0.002	340 35.4	22 42.4	82 26.2	5 29.7	1.31791	1.27428	+8.09	+0.9078
Oct. 1	0.7496	+3.012	+0.006	340 37.7	22 42.5	81 22.1	5 25.5	1.31935	1.27446	+8.07	+0.9068

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Oct.	1	0.7496	+3.012	+0.006	340 37.7	22 42.5	81 22.1	5 25.5	1.31935	1.27446	+8.07	+0.90
	2	0.7523	3.019	0.009	340 37.5	22 42.5	80 18.0	5 21.2	1.32067	1.27465	8.05	0.90
	3	0.7550	3.025	0.010	340 35.5	22 42.4	79 13.9	5 16.9	1.32184	1.27488	8.03	0.90
	4	0.7578	3.032	0.008	340 32.8	22 42.2	78 9.8	5 12.7	1.32269	1.27514	8.00	0.90
h	5	0.7605	3.039	+0.004	340 30.5	22 42.0	77 5.7	5 8.4	1.32320	1.27540	7.97	0.90
(1.0)	6	0.7632	+3.045	−0.001	340 30.1	22 42.0	76 1.7	5 4.1	1.32339	1.27569	+7.94	+0.8
	7	0.7660	3.052	0.007	340 32.9	22 42.2	74 57.8	4 59.9	1.32335	1.27601	7.91	0.8
	8	0.7687	3.059	0.012	340 39.6	22 42.6	73 53.9	4 55.6	1.32328	1.27634	7.88	0.89
	9	0.7714	3.066	0.015	340 49.9	22 43.3	72 50.1	4 51.3	1.32336	1.27669	7.84	0.89
	10	0.7742	3.072	0.015	341 2.7	22 44.2	71 46.4	4 47.1	1.32380	1.27706	7.80	0.89
	11	0.7769	+3.079	−0.011	341 16.2	22 45.1	70 42.7	4 42.8	1.32474	1.27746	+7.76	+0.88
	12	0.7797	3.086	−0.005	341 28.2	22 45.9	69 39.1	4 38.6	1.32614	1.27788	7.71	0.88
	13	0.7824	3.093	+0.003	341 37.2	22 46.5	68 35.6	4 34.4	1.32788	1.27831	7.67	0.88
	14	0.7851	3.100	0.011	341 42.0	22 46.8	67 32.3	4 30.2	1.32970	1.27876	7.62	0.88
	15	0.7879	3.107	0.016	341 43.1	22 46.9	66 29.0	4 25.9	1.33142	1.27923	7.57	0.87
	16	0.7906	+3.115	+0.018	341 41.4	22 46.8	65 25.8	4 21.7	1.33277	1.27971	+7.51	+0.87
	17	0.7934	3.122	0.017	341 38.8	22 46.6	64 22.7	4 17.5	1.33369	1.28021	7.46	0.87
	18	0.7961	3.129	0.012	341 37.2	22 46.5	63 19.8	4 13.3	1.33413	1.28072	7.40	0.86
	19	0.7988	3.137	+0.006	341 38.2	22 46.5	62 17.0	4 9.1	1.33426	1.28125	7.34	0.86
h	20	0.8016	3.144	−0.001	341 42.4	22 46.8	61 14.2	4 4.9	1.33418	1.28180	7.28	0.86
(2.0)	21	0.8043	+3.152	−0.007	341 50.0	22 47.3	60 11.6	4 0.8	1.33412	1.28235	+7.21	+0.8
	22	0.8070	3.159	0.010	342 0.2	22 48.0	59 9.1	3 56.6	1.33422	1.28292	7.14	0.85
	23	0.8098	3.167	0.012	342 12.1	22 48.8	58 6.8	3 52.5	1.33462	1.28350	7.08	0.84
	24	0.8125	3.175	0.011	342 24.3	22 49.6	57 4.7	3 48.3	1.33533	1.28409	7.00	0.845
	25	0.8153	3.182	0.008	342 35.4	22 50.4	56 2.6	3 44.2	1.33635	1.28469	6.93	0.840
	26	0.8180	+3.190	−0.004	342 45.3	22 51.0	55 0.7	3 40.0	1.33760	1.28530	+6.86	+0.836
	27	0.8207	3.198	+0.001	342 52.6	22 51.5	53 58.9	3 35.9	1.33901	1.28591	6.78	0.8310
	28	0.8235	3.207	0.005	342 57.6	22 51.8	52 57.2	3 31.8	1.34050	1.28654	6.70	0.8259
	29	0.8262	3.215	0.008	343 0.1	22 52.0	51 55.7	3 27.7	1.34192	1.28717	6.62	0.8206
	30	0.8290	3.223	0.009	343 0.6	22 52.0	50 54.4	3 23.6	1.34318	1.28780	6.53	0.8150
	31	0.8317	+3.232	+0.008	343 0.3	22 52.0	49 53.2	3 19.5	1.34419	1.28844	+6.45	+0.8092
Nov.	1	0.8344	3.240	+0.005	342 59.9	22 52.0	48 52.1	3 15.5	1.34490	1.28909	6.36	0.8033
	2	0.8372	3.249	0.000	343 1.0	22 52.1	47 51.2	3 11.4	1.34532	1.28974	6.27	0.7971
	3	0.8399	3.257	−0.006	343 4.8	22 52.3	46 50.4	3 7.4	1.34552	1.29040	6.18	0.7907
	4	0.8426	3.266	0.012	343 12.2	22 52.8	45 49.8	3 3.3	1.34565	1.29105	6.08	0.7840
h	5	0.8454	+3.275	−0.016	343 23.0	22 53.4	44 49.2	2 59.3	1.34593	1.29171	+5.98	+0.7771
(3.0)	6	0.8481	3.284	0.016	343 36.4	22 54.4	43 48.9	2 55.3	1.34651	1.29237	5.89	0.7700
	7	0.8508	3.293	0.014	343 50.9	22 55.4	42 48.8	2 51.3	1.34757	1.29303	5.79	0.7626
	8	0.8536	3.302	−0.008	344 4.4	22 56.3	41 48.7	2 47.3	1.34907	1.29368	5.69	0.7540
	9	0.8563	3.311	0.000	344 15.4	22 57.0	40 48.8	2 43.3	1.35095	1.29433	5.58	0.7460
	10	0.8591	+3.321	+0.008	344 22.4	22 57.4	39 49.1	2 39.3	1.35299	1.29498	+5.48	+0.7387
	11	0.8618	3.330	0.015	344 25.7	22 57.7	38 49.6	2 35.3	1.35492	1.29563	5.37	0.7301
	12	0.8645	3.340	0.019	344 25.7	22 57.7	37 50.2	2 31.3	1.35659	1.29626	5.26	0.7213
	13	0.8673	3.349	0.018	344 24.6	22 57.6	36 50.9	2 27.4	1.35790	1.29690	5.15	0.7121
	14	0.8700	3.359	0.015	344 23.8	22 57.4	35 51.8	2 23.5	1.35874	1.29753	5.04	0.7026
	15	0.8728	+3.369	+0.009	344 24.9	22 57.5	34 52.9	2 19.5	1.35918	1.29816	+4.93	+0.6927
	16	0.8755	+3.379	+0.002	344 29.1	22 57.9	33 54.1	2 15.6	1.35944	1.29877	+4.81	+0.6825

FOR WASHINGTON MEAN MIDNIGHT.

Day. lereal ur.)	τ	*f*	*f′*	*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
r. 16	0.8755	+3.379	+0.002	344 29.1	22 57.9	33 54.1	2 15.6	1.35944	1.29877	+4.81	+0.6825
17	0.8782	3.389	−0.004	344 36.4	22 58.4	32 55.4	2 11.7	1.35967	1.29937	4.70	0.6718
18	0.8810	3.399	0.009	344 46.5	22 59.1	31 56.8	2 7.8	1.36002	1.29996	4.58	0.6608
19	0.8837	3.409	0.011	344 58.1	22 59.9	30 58.4	2 3.9	1.36065	1.30055	4.46	0.6493
20	0.8864	3.420	0.011	345 10.3	23 0.7	30 0.2	2 0.0	1.36160	1.30113	4.34	0.6374
) 21	0.8892	+3.430	−0.008	345 21.7	23 1.4	29 2.1	1 56.1	1.36285	1.30170	+4.22	+0.6250
22	0.8919	3.440	−0.005	345 31.4	23 2.1	28 4.1	1 52.3	1.36431	1.30226	4.09	0.6121
23	0.8947	3.451	0.000	345 39.1	23 2.6	27 6.2	1 48.4	1.36596	1.30280	3.97	0.5986
24	0.8974	3.462	+0.004	345 44.2	23 2.9	26 8.4	1 44.6	1.36766	1.30333	3.84	0.5846
25	0.9002	3.472	0.008	345 47.1	23 3.1	25 10.8	1 40.7	1.36935	1.30384	3.72	0.5700
26	0.9029	+3.483	+0.009	345 47.9	23 3.2	24 13.2	1 36.9	1.37088	1.30434	+3.59	+0.5547
27	0.9056	3.494	0.009	345 47.5	23 3.2	23 15.8	1 33.1	1.37219	1.30484	3.46	0.5387
28	0.9084	3.505	0.006	345 46.9	23 3.1	22 18.5	1 29.2	1.37323	1.30531	3.33	0.5219
29	0.9111	3.516	+0.001	345 47.2	23 3.1	21 21.3	1 25.4	1.37399	1.30577	3.19	0.5043
30	0.9138	3.527	−0.005	345 49.6	23 3.3	20 24.1	1 21.6	1.37452	1.30620	3.06	0.4858
c. 1	0.9166	+3.538	−0.011	345 55.0	23 3.7	19 27.1	1 17.8	1.37497	1.30663	+2.93	+0.4664
2	0.9193	3.550	0.016	346 3.6	23 4.2	18 30.2	1 14.0	1.37551	1.30704	2.79	0.4458
3	0.9220	3.561	0.018	346 14.9	23 5.0	17 33.3	1 10.2	1.37631	1.30743	2.66	0.4242
4	0.9248	3.572	0.016	346 27.4	23 5.8	16 36.5	1 6.4	1.37751	1.30781	2.52	0.4012
5	0.9275	3.584	0.011	346 39.4	23 6.6	15 39.8	1 2.7	1.37916	1.30816	2.38	0.3768
0) 6	0.9302	+3.595	−0.004	346 49.2	23 7.3	14 43.2	0 58.9	1.38117	1.30850	+2.24	+0.3507
7	0.9330	3.607	+0.005	346 55.7	23 7.7	13 46.6	0 55.1	1.38342	1.30882	2.10	0.3229
8	0.9357	3.618	0.013	346 58.3	23 7.9	12 50.1	0 51.3	1.38563	1.30911	1.96	0.2930
9	0.9385	3.630	0.018	346 57.8	23 7.9	11 53.7	0 47.6	1.38762	1.30938	1.82	0.2608
10	0.9412	3.642	0.019	346 55.5	23 7.7	10 57.3	0 43.8	1.38923	1.30965	1.68	0.2257
11	0.9439	+3.654	+0.017	346 53.0	23 7.5	10 0.9	0 40.1	1.39043	1.30989	+1.54	+0.1875
12	0.9467	3.665	0.012	346 52.1	23 7.5	9 4.7	0 36.3	1.39126	1.31010	1.40	0.1454
13	0.9494	3.677	+0.005	346 53.6	23 7.6	8 8.5	0 32.6	1.39182	1.31030	1.26	0.0987
14	0.9522	3.689	−0.002	346 58.2	23 7.9	7 12.3	0 28.8	1.39231	1.31047	1.11	0.0461
15	0.9549	3.701	0.007	347 5.3	23 8.4	6 16.1	0 25.1	1.39289	1.31063	0.97	9.9861
16	0.9576	+3.713	−0.010	347 14.2	23 8.9	5 20.0	0 21.3	1.39369	1.31076	+0.83	+9.9163
17	0.9604	3.725	0.010	347 23.6	23 9.6	4 23.9	0 17.6	1.39476	1.31088	0.68	9.8329
18	0.9631	3.736	0.009	347 32.4	23 10.2	3 27.8	0 13.9	1.39610	1.31098	0.54	9.7294
19	0.9658	3.748	0.005	347 39.9	23 10.7	2 31.8	0 10.1	1.39771	1.31104	0.39	9.5931
20	0.9686	3.760	−0.001	347 45.3	23 11.0	1 35.8	0 6.4	1.39942	1.31109	0.25	9.3931
h .0) 21	0.9713	+3.772	+0.004	347 48.7	23 11.2	0 39.7	0 2.6	1.40121	1.31111	+0.10	+9.0107
22	0.9741	3.784	0.007	347 49.4	23 11.3	359 43.6	23 58.9	1.40300	1.31111	−0.04	−8.6260
23	0.9768	3.796	0.010	347 48.3	23 11.2	358 47.6	23 55.2	1.40463	1.31110	0.19	9.2719
24	0.9795	3.808	0.010	347 45.9	23 11.1	357 51.5	23 51.4	1.40610	1.31107	0.33	9.5208
25	0.9823	3.820	0.008	347 43.1	23 10.9	356 55.4	23 47.7	1.40730	1.31100	0.48	9.6780
26	0.9850	+3.832	+0.003	347 40.8	23 10.7	355 59.3	23 44.0	1.40824	1.31092	−0.62	−9.7931
27	0.9878	3.844	−0.003	347 40.0	23 10.7	355 3.1	23 40.2	1.40891	1.31081	0.76	9.8838
28	0.9905	3.856	0.009	347 41.8	23 10.8	354 6.9	23 36.5	1.40948	1.31069	0.91	9.9588
29	0.9932	3.868	0.015	347 46.4	23 11.1	353 10.7	23 32.7	1.41007	1.31055	1.05	0.0226
30	0.9960	3.880	0.018	347 53.6	23 11.6	352 14.4	23 29.0	1.41084	1.31038	1.20	0.0780
31	0.9987	+3.892	−0.018	348 2.3	23 12.2	351 18.1	23 25.2	1.41194	1.31019	−1.34	−0.1271
32	1.0014	+3.903	−0.014	348 11.0	23 12.7	350 21.7	23 21.4	1.41344	1.30998	−1.48	−0.171

FOR WASHINGTON SIDEREAL TWELVE HOURS.

Mean Solar Date.	Log A_1.	Log B_1.	Log C.	Log D.	f	G_1	H	Log g_1.	Log h.	Log
					s	° ′	° ′			
Jan. 0.72	+9.2573	−0.8651	−0.5110	+1.3045	+0.557	296 19	350 52	0.9126	1.3101	−0.14
10.70	9.3405	0.8683	0.8100	1.2838	0.674	300 44	341 26	0.9340	1.3070	0.44
20.67	9.4068	0.8745	0.9761	1.2475	0.786	304 20	331 50	0.9576	1.3022	0.61
30.64	9.4602	0.8826	1.0853	1.1928	0.888	307 10	322 1	0.9811	1.2962	0.72
Feb. 9.61	9.5034	0.8910	1.1611	1.1145	0.981	309 23	311 56	1.0029	1.2896	0.79
19.59	+9.5389	−0.8985	−1.2137	+1.0023	+1.065	311 13	301 34	1.0221	1.2833	−0.85
Mar. 1.56	9.5685	0.9040	1.2483	0.8323	1.139	312 48	290 59	1.0384	1.2781	0.88
11.53	9.5940	0.9066	1.2678	+0.5247	1.208	314 18	280 14	1.0519	1.2748	0.905
21.50	9.6171	0.9057	1.2736	−9.2669	1.274	315 53	269 26	1.0630	1.2737	0.910
31.48	9.6390	0.9012	1.2665	0.5670	1.340	317 37	258 42	1.0725	1.2750	0.903
Apr. 10.45	+9.6608	−0.8934	−1.2461	−0.8492	+1.409	319 33	248 9	1.0814	1.2785	−0.88
20.42	9.6832	0.8827	1.2114	1.0095	1.484	321 42	237 52	1.0905	1.2836	0.84
30.40	9.7066	0.8700	1.1601	1.1161	1.565	323 59	227 54	1.1006	1.2897	0.79
May 10.37	9.7310	0.8562	1.0879	1.1909	1.655	326 21	218 16	1.1126	1.2960	0.72
20.34	9.7561	0.8425	0.9864	1.2439	1.753	328 40	208 56	1.1266	1.3018	0.62
30.31	+9.7815	−0.8302	−0.8377	−1.2798	+1.859	330 50	199 52	1.1424	1.3065	−0.47
June 9.28	9.8068	0.8204	0.5898	1.3016	1.971	332 46	190 59	1.1598	1.3096	0.22
19.26	9.8312	0.8139	−9.9005	1.3107	2.085	334 23	182 14	1.1782	1.3110	−9.53
29.23	9.8546	0.8112	+0.3647	1.3078	2.200	335 42	173 30	1.1969	1.3106	+0.00
July 9.20	9.8763	0.8123	0.7293	1.2926	2.313	336 42	164 43	1.2152	1.3083	0.36
19.18	+9.8962	−0.8166	+0.9171	−1.2644	+2.422	337 27	155 48	1.2327	1.3044	+0.55
29.15	9.9141	0.8232	1.0389	1.2211	2.524	337 58	146 41	1.2490	1.2991	0.67
Aug. 8.12	9.9300	0.8310	1.1245	1.1592	2.618	338 20	137 17	1.2638	1.2931	0.76
18.09	9.9441	0.8387	1.1857	1.0723	2.703	338 37	127 36	1.2771	1.2869	0.82
28.07	9.9564	0.8451	1.2287	0.9473	2.781	338 53	117 37	1.2886	1.2812	0.86
Sept. 7.04	+9.9674	−0.8491	+1.2566	−0.7508	+2.852	339 12	107 20	1.2987	1.2768	+0.89
17.01	9.9774	0.8500	1.2711	−0.3491	2.919	339 36	96 49	1.3076	1.2742	0.908
26.98	9.9869	0.8471	1.2729	+0.0958	2.983	340 7	86 12	1.3156	1.2738	0.910
Oct. 6.96	9.9963	0.8402	1.2618	0.6732	3.048	340 48	75 32	1.3232	1.2758	0.899
16.93	0.0061	0.8294	1.2371	0.9061	3.118	341 38	64 59	1.3308	1.2799	0.874
26.90	+0.0166	−0.8151	+1.1967	+1.0484	+3.194	342 35	54 36	1.3390	1.2855	+0.834
Nov. 5.88	0.0279	0.7985	1.1371	1.1456	3.278	343 36	44 26	1.3479	1.2920	0.774
15.85	0.0402	0.7806	1.0519	1.2142	3.372	344 39	34 32	1.3580	1.2984	0.689
25.82	0.0533	0.7633	0.9278	1.2617	3.476	345 39	24 52	1.3691	1.3040	0.565
Dec. 5.79	0.0670	0.7482	0.7320	1.2924	3.587	346 32	15 23	1.3811	1.3083	0.369
15.77	+0.0809	−0.7371	+0.3314	+1.3083	+3.704	347 16	6 1	1.3937	1.3107	+0.968
25.74	0.0947	0.7311	−0.0711	1.3102	3.823	347 49	356 42	1.4065	1.3110	−9.708
35.71	+0.1079	−0.7306	−0.6501	+1.2985	+3.941	348 11	347 20	1.4192	1.3092	−0.287

$E = +0^{s}.002$.

The above numbers give the same reductions from mean to apparent place as are employed in computing the apparent places of the fixed stars, given on pages 287 to 486, from the mean places, given on pages 233 to 250. In order to render exact interpolation possible through intervals of ten days, all short period terms have been omitted.

ERMS OF SHORT PERIOD IN THE NUTATION, 1915.

FOR WASHINGTON MEAN MIDNIGHT.

te.	δ''ψ	δ''ω	Date.	δ''ψ	δ''ω	Date.	δ''ψ	δ''ω	Date.	δ''ψ
	″	″		″	″		″	″		″
0	+0.02	−0.10	Feb. 15	+0.11	+0.10	Apr. 1	−0.24	+0.02	May 17	+0.05
1	0.10	0.07	16	0.00	0.10	2	0.21	−0.04	18	0.12
2	0.16	−0.04	17	−0.10	0.08	3	0.13	0.08	19	0.15
3	0.18	+0.01	18	0.17	0.05	4	−0.02	0.11	20	0.14
4	0.15	0.06	19	0.21	+0.01	5	+0.11	0.11	21	+0.09
5	+0.07	0.09	20	0.21	−0.03	6	0.22	0.08	22	0.00
6	−0.03	0.11	21	0.18	0.07	7	0.29	−0.04	23	−0.10
7	0.14	0.10	22	0.12	0.09	8	0.31	+0.01	24	0.20
8	0.23	0.07	23	−0.04	0.10	9	0.26	0.06	25	0.26
9	0.27	+0.02	24	+0.05	0.09	10	0.18	0.09	26	0.27
10	−0.24	−0.04	25	+0.12	−0.06	11	+0.07	+0.10	27	−0.22
11	0.17	0.08	26	0.17	−0.02	12	−0.04	0.09	28	0.12
12	−0.05	0.11	27	0.17	+0.03	13	0.13	0.07	29	−0.01
13	+0.09	0.11	28	0.13	0.07	14	0.19	+0.03	30	+0.15
14	0.20	0.08	Mar. 1	+0.05	0.10	15	0.24	−0.01	31	0.26
15	0.28	−0.04	2	−0.05	0.11	16	0.20	0.05	June 1	0.31
16	0.30	+0.01	3	0.15	0.09	17	0.15	0.08	2	0.31
17	0.26	0.06	4	0.22	+0.05	18	0.09	0.10	3	0.26
18	0.19	0.09	5	0.24	0.00	19	−0.01	0.10	4	0.16
19	+0.08	0.10	6	0.20	−0.05	20	+0.07	0.08	5	+0.05
20	−0.02	+0.10	7	−0.11	−0.09	21	+0.12	−0.05	6	−0.05
21	0.12	0.07	8	+0.02	0.11	22	0.15	0.00	7	0.13
22	0.18	+0.04	9	0.14	0.10	23	0.13	+0.04	8	0.18
23	0.21	0.00	10	0.24	0.07	24	+0.07	0.08	9	0.19
24	0.20	−0.04	11	0.29	−0.02	25	−0.02	0.10	10	0.16
25	0.16	0.08	12	0.29	+0.03	26	0.12	0.10	11	0.11
26	0.09	0.10	13	0.23	0.07	27	0.21	0.08	12	−0.03
27	−0.01	0.10	14	0.14	0.10	28	0.25	+0.03	13	+0.04
28	+0.08	0.08	15	+0.03	0.10	29	0.24	−0.02	14	0.11
29	0.15	−0.05	16	−0.07	0.09	30	0.18	0.07	15	0.15
30	+0.18	0.00	17	−0.15	+0.06	May 1	−0.06	−0.10	16	+0.16
31	0.17	+0.04	18	0.20	+0.02	2	+0.07	0.11	17	0.12
b. 1	0.11	0.08	19	0.21	−0.02	3	0.20	0.09	18	+0.04
2	+0.02	0.10	20	0.19	0.06	4	0.29	−0.05	19	−0.06
3	−0.09	0.10	21	0.14	0.09	5	0.32	0.00	20	0.17
4	0.19	0.08	22	−0.07	0.10	6	0.30	+0.05	21	0.25
5	0.25	+0.03	23	+0.02	0.09	7	0.22	0.08	22	0.29
6	0.25	−0.02	24	0.09	0.07	8	0.12	0.10	23	0.26
7	0.19	0.07	25	0.14	−0.03	9	+0.01	0.10	24	0.18
8	−0.08	0.10	26	0.16	+0.01	10	−0.09	0.08	25	−0.06
9	+0.05	−0.11	27	+0.13	+0.06	11	−0.16	+0.04	26	+0.08
10	0.17	0.09	28	+0.06	0.09	12	0.20	0.00	27	0.20
11	0.25	0.05	29	−0.03	0.11	13	0.20	−0.04	28	0.29
12	0.29	−0.01	30	0.13	0.10	14	0.16	0.07	29	0.31
13	0.27	+0.04	31	0.21	0.06	15	0.10	0.09	30	0.27
14	0.20	0.08	Apr. 1	0.24	+0.02	16	−0.02	0.10	July 1	0.19
15	+0.11	+0.10	2	−0.21	−0.04	17	+0.05	−0.08	2	+0.09

FOR WASHINGTON MEAN MIDNIGHT.

Date.	δ''ψ	δ''ω	Date.	δ''ψ	δ''ω	Date.	δ''ψ	δ''ω	Date.	δ''ψ	δ'
	″	″		″	″		″	″		″	
July 1	+0.19	+0.09	Aug. 16	−0.27	0.00	Oct. 1	+0.10	−0.07	Nov. 16	+0.03	+0
2	+0.09	0.10	17	0.23	−0.05	2	0.14	−0.04	17	−0.07	0
3	−0.02	0.09	18	0.14	0.09	3	0.16	+0.01	18	0.14	0
4	0.11	0.07	19	−0.02	0.11	4	0.13	0.05	19	0.18	−0
5	0.16	+0.03	20	+0.11	0.10	5	+0.07	0.08	20	0.17	−0
6	0.18	−0.01	21	0.22	0.07	6	−0.02	0.10	21	0.14	0
7	0.16	0.05	22	0.27	−0.02	7	0.12	0.10	22	−0.07	0
8	0.12	0.08	23	0.27	+0.03	8	0.20	0.07	23	0.00	0
9	−0.05	0.10	24	0.22	0.08	9	0.25	+0.03	24	+0.07	0
10	+0.03	0.09	25	0.13	0.10	10	0.25	−0.02	25	0.12	0
11	+0.10	−0.07	26	+0.03	+0.10	11	−0.19	−0.07	26	+0.15	−0
12	0.15	−0.04	27	−0.07	0.08	12	−0.08	0.10	27	0.14	+0
13	0.17	0.00	28	0.14	0.05	13	+0.05	0.11	28	0.10	0
14	0.15	+0.05	29	0.18	+0.01	14	0.17	0.09	29	+0.02	0
15	+0.08	0.08	30	0.18	−0.03	15	0.26	−0.05	30	−0.08	0
16	−0.02	0.10	31	0.15	0.07	16	0.30	0.00	Dec. 1	0.18	0
17	0.12	0.10	Sept. 1	0.09	0.09	17	0.27	+0.05	2	0.26	0
18	0.22	0.07	2	−0.02	0.10	18	0.20	0.09	3	0.29	+0.
19	0.28	+0.03	3	+0.06	0.09	19	+0.10	0.10	4	0.26	−0.
20	0.28	−0.02	4	0.12	0.06	20	−0.01	0.10	5	0.18	0
21	−0.22	−0.07	5	+0.16	−0.02	21	−0.11	+0.07	6	−0.06	−0.
22	−0.11	0.10	6	0.17	+0.02	22	0.17	+0.04	7	+0.08	0
23	+0.02	0.11	7	0.13	0.06	23	0.19	−0.01	8	0.21	0
24	0.15	0.09	8	+0.06	0.09	24	0.17	0.05	9	0.29	−0
25	0.25	−0.05	9	−0.04	0.10	25	0.13	0.08	10	0.31	+0
26	0.29	0.00	10	0.14	0.09	26	−0.06	0.09	11	0.27	0
27	0.27	+0.05	11	0.22	0.06	27	+0.01	0.09	12	0.19	0.
28	0.21	0.08	12	0.26	+0.01	28	0.08	0.08	13	+0.08	0.
29	0.11	0.10	13	0.24	−0.04	29	0.13	0.05	14	−0.03	0
30	+0.01	0.10	14	0.16	0.08	30	0.15	−0.01	15	0.11	0.
31	−0.09	+0.08	15	−0.05	−0.11	31	+0.14	+0.03	16	−0.16	+0.
Aug. 1	0.15	+0.04	16	+0.08	0.10	Nov. 1	+0.08	0.07	17	0.17	−0.
2	0.18	0.00	17	0.19	0.08	2	0.00	0.10	18	0.14	0.
3	0.17	−0.04	18	0.27	−0.03	3	−0.10	0.10	19	0.08	0.
4	0.13	0.07	19	0.28	+0.02	4	0.19	0.08	20	−0.01	0.
5	−0.07	0.09	20	0.24	0.06	5	0.26	+0.05	21	+0.06	0.
6	+0.01	0.09	21	0.16	0.09	6	0.27	0.00	22	0.12	0.
7	0.08	0.08	22	+0.05	0.10	7	0.22	−0.05	23	0.16	−0.
8	0.14	0.05	23	−0.05	0.09	8	−0.12	0.09	24	0.16	+0.
9	0.17	−0.01	24	0.13	0.06	9	+0.01	0.11	25	0.12	0.
10	+0.16	+0.03	25	−0.18	+0.02	10	+0.14	−0.10	26	+0.06	+0.
11	0.11	0.07	26	0.19	−0.02	11	0.25	0.06	27	−0.04	0.1
12	+0.03	0.10	27	0.16	0.07	12	0.30	−0.02	28	0.15	0.1
13	−0.08	0.10	28	0.11	0.08	13	0.30	+0.03	29	0.24	0.
14	0.18	0.09	29	−0.04	0.09	14	0.24	0.08	30	0.29	+0.
15	0.25	+0.05	30	+0.03	0.09	15	0.14	0.10	31	0.29	−0.
16	−0.27	0.00	Oct. 1	+0.10	−0.07	16	+0.03	+0.10	32	−0.23	−0.

WASHINGTON, JANUARY $0^d.732$.

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
Piscium . . .	4.7	0	0	59.112	+ 3.0714	− 6	10	59.04	+20.136
Andromedæ (*Alpheratz*)	2.2	0	3	59.450	3.0960	+28	37	16.23	19.880
Cassiopeiæ . .	2.4	0	4	38.056	3.1851	+58	40	51.55	19.861
Phœnicis . . .	3.9	0	5	5.987	3.0512	−46	12	59.41	19.848
Andromedæ . .	5.1	0	5	53.898	3.1098	+45	35	57.38	20.034
Pegasi . . .	2.9	0	8	51.420	+ 3.0865	+14	42	39.81	+20.021
Andromedæ . .	4.5	0	13	52.995	3.1276	+36	18	50.41	19.962
Ceti . . .	3.8	0	15	5.845	3.0569	− 9	17	42.12	19.973
Tucanæ . . .	4.3	0	15	39.189	3.1477	−65	22	26.29	21.171
Piscium . . .	6.0	0	21	2.687	3.0744	+ 1	28	8.31	19.938
Hydri . . .	2.9	0	21	18.226	+ 3.2000	−77	43	58.65	+20.277
Phœnicis . . .	2.4	0	22	5.172	2.9725	−42	46	3.30	19.550
Ceti . . .	6.0	0	25	42.071	3.0622	− 4	25	36.49	19.919
Ceti . . . †	5.2	0	30	52.341	3.0871	− 4	3	38.03	19.847
Cassiopeiæ . .	3.7	0	32	13.732	3.3288	+53	25	45.39	19.841
Andromedæ . .	4.4	0	32	20.224	+ 3.1977	+33	15	5.76	+19.847
Andromedæ . .	4.5	0	34	3.624	3.1644	+28	51	1.40	19.571
Andromedæ . .	3.5	0	34	46.744	3.2021	+30	23	45.13	19.718
α Cassiopeiæ (*Schedir*) †	*var.*	0	35	40.497	3.3869	+56	4	16.87	19.771
μ Phœnicis . . .	4.6	0	37	18.605	2.8393	−46	33	6.68	19.749
β Ceti . . .	2.2	0	39	19.419	+ 3.0125	−18	27	10.44	+19.793
o Cassiopeiæ . .	4.7	0	39	58.953	3.3314	+47	49	9.82	19.735
1 Cassiopeiæ . .	5.6	0	40	0.695	3.9060	+74	31	25.22	19.715
ζ Andromedæ . .	4.3	0	42	49.797	3.1748	+23	48	17.90	19.618
η Cassiopeiæ . . †	3.6	0	43	56.963	3.6136	+57	21	57.15	19.202
δ Piscium . . .	4.6	0	44	16.251	+ 3.1101	+ 7	7	21.73	+19.629
λ Hydri . . .	5.0	0	45	39.057	2.1010	−75	23	8.87	19.649
Ceti . . .	4.9	0	48	39.747	3.0642	− 1	36	19.65	19.592
γ Cassiopeiæ . .	2.2	0	51	34.034	3.5980	+60	15	24.17	19.535
μ Andromedæ . .	3.9	0	52	1.817	3.3211	+38	2	18.68	19.561
α Sculptoris . . .	4.4	0	54	30.589	+ 2.8904	−29	49	0.63	+19.468
43 H. Cephei . . .	4.5	0	56	54.030	7.6192	+85	48	6.45	19.427
ε Piscium . . .	4.4	0	58	31.808	3.1112	+ 7	25	57.90	19.421
β Phœnicis . . . †	3.4	1	2	17.447	2.6798	−47	10	26.62	19.286
μ Cassiopeiæ . .	5.3	1	2	36.265	3.9699	+54	30	14.24	17.747
η Ceti . . .	3.6	1	4	18.827	+ 3.0175	−10	37	56.92	+19.136
β Andromedæ . .	2.4	1	4	58.060	3.3508	+35	10	12.60	19.129
τ Piscium . . .	4.7	1	6	58.496	3.2972	+29	38	19.22	19.167
ζ Piscium . . . †	5.6	1	9	17.333	3.1319	+ 7	7	34.20	19.084
κ Tucanæ . . . †	5.0	1	12	53.231	2.0395	−69	19	39.52	19.129
f Piscium . . .	5.3	1	13	24.803	+ 3.0926	+ 3	10	1.65	+19.000
υ Piscium . . .	4.7	1	14	47.437	3.2908	+26	49	3.41	18.979
θ Ceti . . .	3.8	1	19	46.449	2.9978	− 8	37	17.93	18.629
δ Cassiopeiæ . .	2.8	1	20	14.640	3.9006	+59	47	38.69	18.793
γ Phœnicis . . .	3.4	1	24	40.499	2.6076	−43	45	13.17	18.468
38 Cassiopeiæ . .	6.0	1	24	52.980	+ 4.4156	+69	49	39.72	+18.614
η Piscium . . .	3.7	1	26	55.924	3.2059	+14	54	28.83	18.618
α Ursæ Min. (*Polaris*) †	2.1	1	29	15.60*	+28.5356	+88	51	6.49	+18.547

13 Ceti, dup. $5^m.5$, $6^m.2$, $0''.3$
α Cassiop., var. irreg. $2^m.2$, $2^m.8$
η Cassiop. comp. $7^m.6$, $4''$ s. pr.

β Phœnicis, dup. $4^m.1$, $4^m.1$, $1''$.
ζ Piscium, star $6^m.5$, $24''$ n. f.

κ Tucanæ, comp. 7^m, $6''$ n.
α Ursæ Min., star 9^m, $18''$ s. pr.

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Apr.	1	0.2485	+1.346	−0.015	317 26.4	21 9.8	257 36.7	17 10.4	1.07125	1.27527	−7.99	−0.90
	2	0.2512	1.353	0.013	317 51.2	21 11.4	256 32.7	17 6.2	1.07112	1.27555	7.96	0.90
	3	0.2540	1.360	0.008	318 18.5	21 13.2	255 28.9	17 1.9	1.07182	1.27585	7.93	0.89
	4	0.2567	1.367	−0.001	318 44.5	21 15.0	254 25.2	16 57.7	1.07339	1.27618	7.89	0.89
	5	0.2595	1.374	+0.007	319 5.7	21 16.4	253 21.6	16 53.4	1.07573	1.27652	7.86	0.89
h	6	0.2622	+1.381	+0.014	319 20.4	21 17.4	252 18.2	16 49.2	1.07846	1.27688	−7.82	−0.8
(13.0)	7	0.2649	1.388	0.018	319 27.9	21 17.9	251 14.9	16 45.0	1.08113	1.27726	7.78	0.89
	8	0.2677	1.395	0.019	319 29.8	21 18.0	250 11.7	16 40.8	1.08332	1.27766	7.74	0.88
	9	0.2704	1.402	0.016	319 28.7	21 17.9	249 8.7	16 36.6	1.08479	1.27808	7.69	0.88
	10	0.2732	1.409	0.011	319 27.9	21 17.9	248 5.8	16 32.4	1.08548	1.27852	7.64	0.88
	11	0.2759	+1.416	+0.004	319 29.5	21 18.0	247 3.2	16 28.2	1.08547	1.27897	−7.59	−0.88
	12	0.2786	1.423	−0.002	319 36.0	21 18.4	246 0.7	16 24.0	1.08500	1.27944	7.54	0.87
	13	0.2814	1.431	0.008	319 47.5	21 19.2	244 58.3	16 19.9	1.08429	1.27992	7.49	0.87
	14	0.2841	1.438	0.012	320 4.0	21 20.3	243 56.1	16 15.7	1.08366	1.28042	7.43	0.87
	15	0.2868	1.445	0.013	320 24.3	21 21.6	242 54.1	16 11.6	1.08338	1.28094	7.37	0.867
	16	0.2896	+1.453	−0.012	320 46.7	21 23.1	241 52.3	16 7.5	1.08354	1.28146	−7.31	−0.86
	17	0.2923	1.460	0.010	321 9.2	21 24.6	240 50.7	16 3.4	1.08431	1.28200	7.25	0.860
	18	0.2950	1.468	−0.005	321 31.4	21 26.1	239 49.2	15 59.3	1.08562	1.28255	7.19	0.85
	19	0.2978	1.476	0.000	321 50.1	21 27.3	238 48.0	15 55.2	1.08744	1.28311	7.12	0.85
	20	0.3005	1.484	+0.004	322 4.8	21 28.3	237 47.0	15 51.1	1.08964	1.28368	7.05	0.84
h	21	0.3033	+1.492	+0.008	322 15.0	21 29.0	236 46.1	15 47.1	1.09194	1.28426	−6.98	−0.84
(14.0)	22	0.3060	1.499	0.009	322 20.6	21 29.4	235 45.5	15 43.0	1.09413	1.28485	6.91	0.83
	23	0.3087	1.508	0.008	322 22.7	21 29.5	234 45.0	15 39.0	1.09589	1.28545	6.84	0.834
	24	0.3115	1.516	+0.004	322 24.4	21 29.6	233 44.8	15 35.0	1.09702	1.28606	6.76	0.8299
	25	0.3142	1.524	−0.001	322 27.4	21 29.8	232 44.8	15 31.0	1.09747	1.28667	6.68	0.824
	26	0.3170	+1.532	−0.007	322 35.0	21 30.3	231 45.0	15 27.0	1.09736	1.28728	−6.60	−0.8196
	27	0.3197	1.540	0.013	322 48.7	21 31.2	230 45.3	15 23.0	1.09689	1.28791	6.52	0.8142
	28	0.3224	1.549	0.016	323 9.3	21 32.6	229 45.9	15 19.1	1.09651	1.28853	6.44	0.8086
	29	0.3252	1.557	0.015	323 35.7	21 34.4	228 46.7	15 15.1	1.09660	1.28915	6.35	0.8027
	30	0.3279	1.566	0.011	324 5.0	21 36.3	227 47.7	15 11.2	1.09746	1.28978	6.26	0.7967
May	1	0.3306	+1.575	−0.004	324 33.2	21 38.1	226 48.9	15 7.3	1.09925	1.29041	−6.17	−0.7905
	2	0.3334	1.583	+0.004	324 58.0	21 39.9	225 50.3	15 3.4	1.10171	1.29104	6.08	0.7841
	3	0.3361	1.592	0.012	325 15.9	21 41.1	224 51.8	14 59.5	1.10462	1.29168	5.99	0.7774
	4	0.3389	1.601	0.018	325 27.0	21 41.8	223 53.6	14 55.6	1.10756	1.29232	5.90	0.7705
	5	0.3416	1.610	0.020	325 32.2	21 42.1	222 55.6	14 51.7	1.11006	1.29295	5.80	0.7634
h	6	0.3443	+1.619	+0.018	325 34.1	21 42.3	221 57.7	14 47.8	1.11193	1.29358	−5.70	−0.7560
(15.0)	7	0.3471	1.628	0.014	325 35.7	21 42.4	221 0.1	14 44.0	1.11303	1.29421	5.60	0.7484
	8	0.3498	1.638	+0.007	325 39.5	21 42.6	220 2.6	14 40.2	1.11348	1.29483	5.50	0.7406
	9	0.3526	1.647	0.000	325 47.5	21 43.2	219 5.3	14 36.4	1.11345	1.29545	5.40	0.7324
	10	0.3553	1.656	−0.006	326 0.5	21 44.0	218 8.2	14 32.5	1.11321	1.29607	5.30	0.7240
	11	0.3580	+1.666	−0.010	326 18.2	21 45.2	217 11.3	14 28.8	1.11307	1.29668	−5.19	−0.7153
	12	0.3608	1.676	0.012	326 39.5	21 46.6	216 14.6	14 25.0	1.11324	1.29729	5.08	0.7063
	13	0.3635	1.685	0.012	327 2.8	21 48.2	215 18.1	14 21.2	1.11390	1.29789	4.98	0.6970
	14	0.3662	1.695	0.010	327 26.3	21 49.7	214 21.7	14 17.4	1.11508	1.29848	4.87	0.6874
	15	0.3690	1.705	0.006	327 48.4	21 51.2	213 25.6	14 13.7	1.11682	1.29907	4.76	0.6774
	16	0.3717	+1.715	−0.001	328 7.6	21 52.5	212 29.5	14 10.0	1.11901	1.29964	−4.65	−0.6670
	17	0.3744	+1.725	+0.003	328 22.8	21 53.5	211 33.7	14 6.2	1.12152	1.30021	−4.53	−0.6563

FOR WASHINGTON MEAN MIDNIGHT.

r Day. lereal ur.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
y 17	0.3744	+1.725	+0.003	328 22.8	21 53.5	211 33.7	14 6.2	1.12152	1.30021	−4.53	−0.6563
18	0.3772	1.735	0.007	328 33.6	21 54.2	210 38.0	14 2.5	1.12415	1.30077	4.42	0.6452
19	0.3799	1.745	0.009	328 40.1	21 54.7	209 42.5	13 58.8	1.12665	1.30131	4.30	0.6337
20	0.3827	1.755	0.009	328 43.2	21 54.9	208 47.2	13 55.1	1.12882	1.30185	4.18	0.6218
21	0.3854	1.766	+0.005	328 45.1	21 55.0	207 52.0	13 51.5	1.13047	1.30238	4.07	0.6093
h .0)22	0.3881	+1.776	0.000	328 48.1	21 55.2	206 57.0	13 47.8	1.13149	1.30289	−3.95	−0.5964
23	0.3909	1.786	−0.006	328 54.8	21 55.7	206 2.1	13 44.1	1.13200	1.30339	3.83	0.5830
24	0.3936	1.797	0.012	329 6.7	21 56.4	205 7.4	13 40.5	1.13218	1.30388	3.71	0.5691
25	0.3964	1.808	0.016	329 25.0	21 57.7	204 12.8	13 36.9	1.13242	1.30435	3.58	0.5546
26	0.3991	1.818	0.017	329 48.7	21 59.2	203 18.4	13 33.2	1.13308	1.30482	3.46	0.5394
27	0.4018	+1.829	−0.014	330 15.3	22 1.0	202 24.1	13 29.6	1.13444	1.30527	−3.34	−0.5236
28	0.4046	1.840	−0.008	330 41.6	22 2.8	201 29.9	13 26.0	1.13661	1.30570	3.21	0.5070
29	0.4073	1.850	+0.001	331 4.2	22 4.3	200 35.9	13 22.4	1.13951	1.30613	3.09	0.4897
30	0.4100	1.861	0.009	331 21.0	22 5.4	199 41.9	13 18.8	1.14283	1.30653	2.96	0.4715
31	0.4128	1.872	0.016	331 31.2	22 6.1	198 48.1	13 15.2	1.14620	1.30691	2.83	0.4524
ne 1	0.4155	+1.883	+0.019	331 35.6	22 6.4	197 54.4	13 11.6	1.14922	1.30729	−2.71	−0.4324
2	0.4183	1.894	0.019	331 36.6	22 6.4	197 0.8	13 8.1	1.15166	1.30764	2.58	0.4112
3	0.4210	1.906	0.016	331 36.9	22 6.5	196 7.3	13 4.5	1.15339	1.30799	2.45	0.3888
4	0.4237	1.917	0.010	331 38.8	22 6.6	195 13.9	13 0.9	1.15448	1.30832	2.32	0.3651
h 5	0.4265	1.928	+0.003	331 44.4	22 7.0	194 20.5	12 57.4	1.15509	1.30863	2.19	0.3399
7.0) 6	0.4292	+1.939	−0.003	331 54.4	22 7.6	193 27.3	12 53.8	1.15550	1.30892	−2.06	−0.3130
7	0.4320	1.950	0.008	332 8.6	22 8.6	192 34.1	12 50.3	1.15596	1.30919	1.92	0.2842
8	0.4347	1.962	0.011	332 26.1	22 9.7	191 41.1	12 46.7	1.15667	1.30945	1.79	0.2532
9	0.4374	1.973	0.011	332 45.4	22 11.0	190 48.0	12 43.2	1.15782	1.30969	1.66	0.2197
10	0.4402	1.984	0.010	333 4.6	22 12.3	189 55.1	12 39.7	1.15943	1.30991	1.52	0.1833
11	0.4429	+1.996	−0.007	333 22.6	22 13.5	189 2.2	12 36.1	1.16152	1.31011	−1.39	−0.1435
12	0.4456	2.007	−0.002	333 38.0	22 14.5	188 9.4	12 32.6	1.16403	1.31030	1.26	0.0995
13	0.4484	2.019	+0.003	333 49.7	22 15.3	187 16.6	12 29.1	1.16678	1.31047	1.12	0.0504
14	0.4511	2.030	0.007	333 57.3	22 15.8	186 23.9	12 25.6	1.16965	1.31062	0.99	9.9949
15	0.4538	2.042	0.009	334 0.9	22 16.1	185 31.2	12 22.1	1.17243	1.31074	0.85	9.9311
16	0.4566	+2.053	+0.010	334 1.2	22 16.1	184 38.5	12 18.6	1.17491	1.31086	−0.72	−9.8563
17	0.4593	2.065	0.007	334 0.1	22 16.0	183 45.9	12 15.1	1.17689	1.31095	0.58	9.7656
18	0.4621	2.076	+0.002	333 59.5	22 16.0	182 53.4	12 11.6	1.17833	1.31101	0.45	9.6508
19	0.4648	2.088	−0.004	334 1.4	22 16.1	182 0.8	12 8.1	1.17928	1.31106	0.31	9.4941
20	0.4675	2.099	0.010	334 8.1	22 16.5	181 8.3	12 4.6	1.17993	1.31110	0.18	9.2464
h 21	0.4703	+2.111	−0.016	334 20.1	22 17.3	180 15.8	12 1.1	1.18054	1.31111	−0.04	−8.6101
18.0)22	0.4730	2.122	0.018	334 36.9	22 18.5	179 23.3	11 57.6	1.18147	1.31111	+0.10	+8.9770
23	0.4758	2.134	0.016	334 56.8	22 19.8	178 30.8	11 54.1	1.18298	1.31110	0.23	9.3625
24	0.4785	2.145	0.011	335 16.8	22 21.1	177 38.3	11 50.6	1.18520	1.31105	0.37	9.5633
25	0.4812	2.157	−0.003	335 34.2	22 22.3	176 45.8	11 47.1	1.18808	1.31099	0.50	9.7000
26	0.4840	+2.169	+0.005	335 46.5	22 23.1	175 53.3	11 43.6	1.19137	1.31091	+0.64	+9.8037
27	0.4867	2.180	0.013	335 53.1	22 23.5	175 0.8	11 40.1	1.19479	1.31081	0.77	9.8873
28	0.4894	2.192	0.018	335 54.3	22 23.6	174 8.2	11 36.5	1.19797	1.31070	0.91	9.9572
29	0.4922	2.203	0.019	335 51.8	22 23.5	173 15.6	11 33.0	1.20060	1.31056	1.04	0.0173
30	0.4949	2.214	0.017	335 48.3	22 23.2	172 23.0	11 29.5	1.20263	1.31040	1.18	0.0700
July 1	0.4977	+2.226	+0.012	335 46.0	22 23.1	171 30.4	11 26.0	1.20404	1.31023	+1.31	+0.1169
2	0.5004	+2.237	+0.005	335 46.6	22 23.1	170 37.7	11 22.5	1.20496	1.31004	+1.44	+0.1591

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f	f′	G		H		Log g.	Log h.	i	Log
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
July 1	0.4977	+2.226	+0.012	335 46.0	22 23.1	171 30.4	11 26.0	1.20404	1.31023	+1.31	+0.1
2	0.5004	2.237	+0.005	335 46.6	22 23.1	170 37.7	11 22.5	1.20496	1.31004	1.44	0.1
3	0.5031	2.249	−0.001	335 51.1	22 23.4	169 44.9	11 19.0	1.20564	1.30983	1.58	0.1
4	0.5059	2.260	0.006	335 59.6	22 24.0	168 52.1	11 15.5	1.20631	1.30960	1.71	0.2
5	0.5086	2.271	0.010	336 11.1	22 24.7	167 59.2	11 11.9	1.20716	1.30936	1.84	0.2
h 6	0.5114	+2.283	−0.011	336 24.5	22 25.6	167 6.3	11 8.4	1.20839	1.30909	+1.97	+0.2
(19.0) 7	0.5141	2.294	0.010	336 38.1	22 26.5	166 13.3	11 4.9	1.20997	1.30881	2.10	0.3
8	0.5168	2.305	0.007	336 50.5	22 27.4	165 20.2	11 1.3	1.21198	1.30852	2.23	0.3
9	0.5196	2.316	−0.003	337 0.7	22 28.0	164 27.0	10 57.8	1.21433	1.30820	2.36	0.37
10	0.5223	2.327	+0.002	337 7.9	22 28.5	163 33.7	10 54.2	1.21692	1.30787	2.49	0.3
11	0.5250	+2.338	+0.006	337 11.4	22 28.8	162 40.4	10 50.7	1.21959	1.30752	+2.62	+0.4
12	0.5278	2.349	0.009	337 11.4	22 28.8	161 47.0	10 47.1	1.22222	1.30716	2.75	0.4
13	0.5305	2.360	0.010	337 8.5	22 28.6	160 53.5	10 43.6	1.22457	1.30679	2.88	0.4
14	0.5332	2.371	0.009	337 3.9	22 28.3	159 59.8	10 40.0	1.22654	1.30639	3.00	0.47
15	0.5360	2.382	+0.005	336 59.3	22 28.0	159 6.1	10 36.4	1.22802	1.30598	3.13	0.4
16	0.5387	+2.393	−0.001	336 56.7	22 27.8	158 12.3	10 32.8	1.22905	1.30555	+3.26	+0.51
17	0.5415	2.404	0.008	336 57.9	22 27.9	157 18.3	10 29.2	1.22972	1.30511	3.38	0.5
18	0.5442	2.414	0.014	337 3.4	22 28.2	156 24.3	10 25.6	1.23028	1.30466	3.50	0.54
19	0.5469	2.425	0.017	337 13.5	22 28.9	155 30.1	10 22.0	1.23102	1.30420	3.62	0.55
20	0.5497	2.435	0.017	337 26.9	22 29.8	154 35.8	10 18.4	1.23222	1.30373	3.74	0.57
h 21	0.5524	+2.446	−0.013	337 41.1	22 30.7	153 41.4	10 14.8	1.23400	1.30324	+3.86	+0.5
(20.0) 22	0.5552	2.457	−0.007	337 53.6	22 31.6	152 46.9	10 11.1	1.23638	1.30274	3.98	0.6
23	0.5579	2.466	+0.002	338 2.3	22 32.2	151 52.2	10 7.5	1.23921	1.30222	4.10	0.61
24	0.5606	2.476	0.009	338 5.8	22 32.4	150 57.4	10 3.8	1.24220	1.30169	4.22	0.625
25	0.5634	2.487	0.015	338 4.4	22 32.3	150 2.4	10 0.2	1.24501	1.30116	4.33	0.636
26	0.5661	+2.497	+0.018	337 59.6	22 32.0	149 7.3	9 56.5	1.24749	1.30061	+4.45	+0.64
27	0.5688	2.507	0.017	337 52.9	22 31.5	148 12.0	9 52.8	1.24939	1.30006	4.56	0.6591
28	0.5716	2.517	0.013	337 47.2	22 31.1	147 16.6	9 49.1	1.25071	1.29949	4.67	0.6696
29	0.5743	2.527	+0.007	337 44.0	22 30.9	146 21.0	9 45.4	1.25156	1.29892	4.78	0.679
30	0.5771	2.536	0.000	337 44.2	22 31.0	145 25.3	9 41.7	1.25211	1.29834	4.89	0.6896
31	0.5798	+2.546	−0.005	337 48.1	22 31.2	144 29.4	9 38.0	1.25259	1.29775	+5.00	+0.6991
Aug. 1	0.5825	2.556	0.009	337 55.2	22 31.7	143 33.3	9 34.2	1.25320	1.29716	5.11	0.7082
2	0.5853	2.565	0.011	338 4.1	22 32.3	142 37.1	9 30.5	1.25406	1.29656	5.21	0.7171
3	0.5880	2.575	0.010	338 13.7	22 32.9	141 40.6	9 26.7	1.25528	1.29595	5.32	0.7257
4	0.5908	2.584	0.008	338 22.6	22 33.5	140 44.0	9 22.9	1.25684	1.29534	5.42	0.7340
h 5	0.5935	+2.594	−0.004	338 29.6	22 34.0	139 47.2	9 19.1	1.25871	1.29472	+5.52	+0.7420
(21.0) 6	0.5962	2.603	+0.001	338 34.1	22 34.3	138 50.2	9 15.3	1.26081	1.29410	5.62	0.7497
7	0.5990	2.612	0.005	338 35.7	22 34.4	137 53.1	9 11.5	1.26302	1.29347	5.72	0.7572
8	0.6017	2.621	0.009	338 34.1	22 34.3	136 55.8	9 7.7	1.26521	1.29284	5.81	0.7645
9	0.6044	2.630	0.011	338 29.9	22 34.0	135 58.2	9 3.9	1.26718	1.29223	5.91	0.7715
10	0.6072	+2.639	+0.010	338 23.8	22 33.6	135 0.5	9 0.0	1.26886	1.29160	+6.00	+0.7783
11	0.6099	2.647	0.007	338 17.4	22 33.2	134 2.7	8 56.2	1.27011	1.29097	6.09	0.7848
12	0.6126	2.656	+0.002	338 12.4	22 32.8	133 4.6	8 52.3	1.27092	1.29034	6.18	0.7912
13	0.6153	2.665	−0.005	338 10.4	22 32.7	132 6.3	8 48.4	1.27140	1.28971	6.27	0.7973
14	0.6181	2.673	0.011	338 12.4	22 32.8	131 7.8	8 44.5	1.27168	1.28909	6.36	0.8033
15	0.6209	+2.682	−0.015	338 18.6	22 33.2	130 9.2	8 40.6	1.27202	1.28847	+6.44	+0.8090
16	0.6236	+2.690	−0.017	338 28.3	22 33.9	129 10.4	8 36.7	1.27270	1.28785	+6.52	+0.8146

FOR WASHINGTON MEAN MIDNIGHT.

ar Day. idereal Iour.)	τ	*f*	*f′*	*G*		*H*		Log *g*.	Log *h*.	*i*	Log *i*.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
g. 16	0.6236	+2.690	−0.017	338 28.3	22 33.9	129 10.4	8 36.7	1.27270	1.28785	+6.52	+0.8146
17	0.6263	2.698	0.014	338 39.3	22 34.6	128 11.4	8 32.8	1.27386	1.28725	6.61	0.8199
18	0.6291	2.707	0.009	338 49.9	22 35.3	127 12.2	8 28.8	1.27556	1.28664	6.68	0.8251
19	0.6318	2.715	−0.001	338 57.4	22 35.8	126 12.8	8 24.8	1.27769	1.28603	6.76	0.8301
20	0.6346	2.723	+0.007	339 0.8	22 36.1	125 13.2	8 20.9	1.28011	1.28543	6.84	0.8349
h 21	0.6373	+2.731	+0.013	338 59.5	22 36.0	124 13.5	8 16.9	1.28246	1.28484	+6.91	+0.8395
.0) 22	0.6400	2.739	0.017	338 54.6	22 35.6	123 13.6	8 12.9	1.28450	1.28426	6.98	0.8440
23	0.6428	2.746	0.017	338 47.6	22 35.2	122 13.5	8 8.9	1.28606	1.28369	7.05	0.8483
24	0.6455	2.754	0.014	338 41.0	22 34.7	121 13.2	8 4.9	1.28712	1.28312	7.12	0.8524
25	0.6482	2.762	0.008	338 36.2	22 34.4	120 12.7	8 0.8	1.28769	1.28257	7.18	0.8564
26	0.6510	+2.769	+0.002	338 34.7	22 34.3	119 12.0	7 56.8	1.28794	1.28202	+7.25	+0.8603
27	0.6537	2.777	−0.004	338 36.8	22 34.5	118 11.2	7 52.7	1.28808	1.28149	7.31	0.8639
28	0.6565	2.784	0.009	338 42.1	22 34.8	117 10.2	7 48.7	1.28829	1.28097	7.37	0.8675
29	0.6592	2.792	0.011	338 49.6	22 35.3	116 9.0	7 44.6	1.28872	1.28047	7.43	0.8708
30	0.6619	2.799	0.011	338 58.2	22 35.9	115 7.7	7 40.5	1.28944	1.27997	7.48	0.8741
31	0.6647	+2.806	−0.009	339 6.4	22 36.4	114 6.1	7 36.4	1.29048	1.27950	+7.54	+0.8772
ept. 1	0.6674	2.814	0.006	339 13.3	22 36.9	113 4.4	7 32.3	1.29181	1.27903	7.59	0.8801
2	0.6702	2.821	−0.001	339 18.1	22 37.2	112 2.5	7 28.2	1.29337	1.27857	7.64	0.8829
3	0.6729	2.828	+0.004	339 20.3	22 37.3	111 0.5	7 24.0	1.29508	1.27814	7.68	0.8855
4	0.6756	2.835	0.008	339 19.7	22 37.2	109 58.4	7 19.9	1.29676	1.27773	7.73	0.8881
h 5	0.6784	+2.842	+0.010	339 16.6	22 37.1	108 56.0	7 15.7	1.29835	1.27733	+7.77	+0.8904
.0) 6	0.6811	2.849	0.010	339 11.8	22 36.8	107 53.5	7 11.6	1.29968	1.27695	7.81	0.8927
7	0.6838	2.855	0.008	339 6.3	22 36.4	106 50.9	7 7.4	1.30064	1.27659	7.85	0.8948
8	0.6866	2.862	+0.004	339 1.8	22 36.1	105 48.2	7 3.2	1.30123	1.27625	7.88	0.8968
9	0.6893	2.869	−0.003	338 59.6	22 36.0	104 45.3	6 59.0	1.30146	1.27593	7.92	0.8986
10	0.6920	+2.876	−0.009	339 1.0	22 36.1	103 42.3	6 54.8	1.30147	1.27563	+7.95	+0.9004
11	0.6948	2.882	0.014	339 6.5	22 36.4	102 39.1	6 50.6	1.30149	1.27534	7.98	0.9019
12	0.6975	2.889	0.016	339 15.5	22 37.0	101 35.9	6 46.4	1.30172	1.27507	8.00	0.9034
13	0.7003	2.896	0.015	339 26.8	22 37.8	100 32.6	6 42.2	1.30236	1.27483	8.03	0.9047
14	0.7030	2.902	0.010	339 38.1	22 38.5	99 29.2	6 38.0	1.30353	1.27462	8.05	0.9059
15	0.7057	+2.909	−0.003	339 47.2	22 39.1	98 25.6	6 33.7	1.30514	1.27442	+8.07	+0.9070
16	0.7085	2.915	+0.005	339 52.7	22 39.5	97 22.0	6 29.5	1.30701	1.27425	8.09	0.9079
17	0.7112	2.922	0.012	339 54.0	22 39.6	96 18.4	6 25.2	1.30895	1.27410	8.11	0.9088
18	0.7140	2.928	0.016	339 51.6	22 39.4	95 14.6	6 21.0	1.31070	1.27397	8.12	0.9094
19	0.7167	2.935	0.017	339 46.7	22 39.1	94 10.8	6 16.7	1.31201	1.27387	8.13	0.9100
h 20	0.7194	+2.941	+0.015	339 41.5	22 38.8	93 6.9	6 12.5	1.31284	1.27379	+8.14	+0.9104
(0.0) 21	0.7222	2.948	0.010	339 37.8	22 38.5	92 3.0	6 8.2	1.31323	1.27373	8.14	0.9107
22	0.7249	2.954	+0.003	339 36.9	22 38.5	90 59.0	6 3.9	1.31325	1.27369	8.15	0.9109
23	0.7276	2.960	−0.003	339 39.7	22 38.6	89 55.0	5 59.7	1.31314	1.27368	8.15	0.9109
24	0.7304	2.967	0.008	339 45.7	22 39.0	88 50.9	5 55.4	1.31307	1.27370	8.14	0.9109
25	0.7331	+2.973	−0.011	339 54.4	22 39.6	87 46.9	5 51.1	1.31317	1.27374	+8.14	+0.9107
26	0.7359	2.980	0.012	340 4.3	22 40.3	86 42.8	5 46.8	1.31358	1.27379	8.14	0.9104
27	0.7386	2.986	0.010	340 14.4	22 41.0	85 38.6	5 42.6	1.31429	1.27387	8.13	0.9099
28	0.7413	2.993	0.007	340 23.4	22 41.6	84 34.5	5 38.3	1.31529	1.27398	8.12	0.9093
29	0.7441	2.999	−0.002	340 30.6	22 42.0	83 30.3	5 34.0	1.31654	1.27412	8.10	0.9086
30	0.7468	+3.006	+0.002	340 35.4	22 42.4	82 26.2	5 29.7	1.31791	1.27428	+8.09	+0.9078
Oct. 1	0.7496	+3.012	+0.006	340 37.7	22 42.5	81 22.1	5 25.5	1.31935	1.27446	+8.07	+0.9068

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Log
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Oct.	1	0.7496	+3.012	+0.006	340 37.7	22 42.5	81 22.1	5 25.5	1.31935	1.27446	+8.07	+0.90
	2	0.7523	3.019	0.009	340 37.5	22 42.5	80 18.0	5 21.2	1.32067	1.27465	8.05	0.90
	3	0.7550	3.025	0.010	340 35.5	22 42.4	79 13.9	5 16.9	1.32184	1.27488	8.03	0.90
	4	0.7578	3.032	0.008	340 32.8	22 42.2	78 9.8	5 12.7	1.32269	1.27514	8.00	0.90
h	5	0.7605	3.039	+0.004	340 30.5	22 42.0	77 5.7	5 8.4	1.32320	1.27540	7.97	0.90
(1.0)	6	0.7632	+3.045	−0.001	340 30.1	22 42.0	76 1.7	5 4.1	1.32339	1.27569	+7.94	+0.89
	7	0.7660	3.052	0.007	340 32.9	22 42.2	74 57.8	4 59.9	1.32335	1.27601	7.91	0.8
	8	0.7687	3.059	0.012	340 39.6	22 42.6	73 53.9	4 55.6	1.32328	1.27634	7.88	0.8
	9	0.7714	3.066	0.015	340 49.9	22 43.3	72 50.1	4 51.3	1.32336	1.27669	7.84	0.8
	10	0.7742	3.072	0.015	341 2.7	22 44.2	71 46.4	4 47.1	1.32380	1.27706	7.80	0.8
	11	0.7769	+3.079	−0.011	341 16.2	22 45.1	70 42.7	4 42.8	1.32474	1.27746	+7.76	+0.88
	12	0.7797	3.086	−0.005	341 28.2	22 45.9	69 39.1	4 38.6	1.32614	1.27788	7.71	0.88
	13	0.7824	3.093	+0.003	341 37.2	22 46.5	68 35.6	4 34.4	1.32788	1.27831	7.67	0.88
	14	0.7851	3.100	0.011	341 42.0	22 46.8	67 32.3	4 30.2	1.32970	1.27876	7.62	0.88
	15	0.7879	3.107	0.016	341 43.1	22 46.9	66 29.0	4 25.9	1.33142	1.27923	7.57	0.87
	16	0.7906	+3.115	+0.018	341 41.4	22 46.8	65 25.8	4 21.7	1.33277	1.27971	+7.51	+0.87
	17	0.7934	3.122	0.017	341 38.8	22 46.6	64 22.7	4 17.5	1.33369	1.28021	7.46	0.87
	18	0.7961	3.129	0.012	341 37.2	22 46.5	63 19.8	4 13.3	1.33413	1.28072	7.40	0.86
	19	0.7988	3.137	+0.006	341 38.2	22 46.5	62 17.0	4 9.1	1.33426	1.28125	7.34	0.86
h	20	0.8016	3.144	−0.001	341 42.4	22 46.8	61 14.2	4 4.9	1.33418	1.28180	7.28	0.86
(2.0)	21	0.8043	+3.152	−0.007	341 50.0	22 47.3	60 11.6	4 0.8	1.33412	1.28235	+7.21	+0.85
	22	0.8070	3.159	0.010	342 0.2	22 48.0	59 9.1	3 56.6	1.33422	1.28292	7.14	0.85
	23	0.8098	3.167	0.012	342 12.1	22 48.8	58 6.8	3 52.5	1.33462	1.28350	7.08	0.84
	24	0.8125	3.175	0.011	342 24.3	22 49.6	57 4.7	3 48.3	1.33533	1.28409	7.00	0.84
	25	0.8153	3.182	0.008	342 35.4	22 50.4	56 2.6	3 44.2	1.33635	1.28469	6.93	0.84
	26	0.8180	+3.190	−0.004	342 45.3	22 51.0	55 0.7	3 40.0	1.33760	1.28530	+6.86	+0.836
	27	0.8207	3.198	+0.001	342 52.6	22 51.5	53 58.9	3 35.9	1.33901	1.28591	6.78	0.831
	28	0.8235	3.207	0.005	342 57.6	22 51.8	52 57.2	3 31.8	1.34050	1.28654	6.70	0.825
	29	0.8262	3.215	0.008	343 0.1	22 52.0	51 55.7	3 27.7	1.34192	1.28717	6.62	0.820
	30	0.8290	3.223	0.009	343 0.6	22 52.0	50 54.4	3 23.6	1.34318	1.28780	6.53	0.8150
	31	0.8317	+3.232	+0.008	343 0.3	22 52.0	49 53.2	3 19.5	1.34419	1.28844	+6.45	+0.8092
Nov.	1	0.8344	3.240	+0.005	342 59.9	22 52.0	48 52.1	3 15.5	1.34490	1.28909	6.36	0.8033
	2	0.8372	3.249	0.000	343 1.0	22 52.1	47 51.2	3 11.4	1.34532	1.28974	6.27	0.7971
	3	0.8399	3.257	−0.006	343 4.8	22 52.3	46 50.4	3 7.4	1.34552	1.29040	6.18	0.7907
	4	0.8426	3.266	0.012	343 12.2	22 52.8	45 49.8	3 3.3	1.34565	1.29105	6.08	0.7840
h	5	0.8454	+3.275	−0.016	343 23.0	22 53.4	44 49.2	2 59.3	1.34593	1.29171	+5.98	+0.7771
(3.0)	6	0.8481	3.284	0.016	343 36.4	22 54.4	43 48.9	2 55.3	1.34651	1.29237	5.89	0.7700
	7	0.8508	3.293	0.014	343 50.9	22 55.4	42 48.8	2 51.3	1.34757	1.29303	5.79	0.7626
	8	0.8536	3.302	−0.008	344 4.4	22 56.3	41 48.7	2 47.3	1.34907	1.29368	5.69	0.7549
	9	0.8563	3.311	0.000	344 15.4	22 57.0	40 48.8	2 43.3	1.35095	1.29433	5.58	0.7469
	10	0.8591	+3.321	+0.008	344 22.4	22 57.4	39 49.1	2 39.3	1.35299	1.29498	+5.48	+0.7387
	11	0.8618	3.330	0.015	344 25.7	22 57.7	38 49.6	2 35.3	1.35492	1.29563	5.37	0.7301
	12	0.8645	3.340	0.019	344 25.7	22 57.7	37 50.2	2 31.3	1.35659	1.29626	5.26	0.7213
	13	0.8673	3.349	0.018	344 24.6	22 57.6	36 50.9	2 27.4	1.35790	1.29690	5.15	0.7121
	14	0.8700	3.359	0.015	344 23.8	22 57.4	35 51.8	2 23.5	1.35874	1.29753	5.04	0.7026
	15	0.8728	+3.369	+0.009	344 24.9	22 57.5	34 52.9	2 19.5	1.35918	1.29816	+4.93	+0.6927
	16	0.8755	+3.379	+0.002	344 29.1	22 57.9	33 54.1	2 15.6	1.35944	1.29877	+4.81	+0.6825

FOR WASHINGTON MEAN MIDNIGHT.

Day. ereal ur.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
. 16	0.8755	+3.379	+0.002	344 29.1	22 57.9	33 54.1	2 15.6	1.35944	1.29877	+4.81	+0.6825
17	0.8782	3.389	−0.004	344 36.4	22 58.4	32 55.4	2 11.7	1.35967	1.29937	4.70	0.6718
18	0.8810	3.399	0.009	344 46.5	22 59.1	31 56.8	2 7.8	1.36002	1.29996	4.58	0.6608
19	0.8837	3.409	0.011	344 58.1	22 59.9	30 58.4	2 3.9	1.36065	1.30055	4.46	0.6493
20	0.8864	3.420	0.011	345 10.3	23 0.7	30 0.2	2 0.0	1.36160	1.30113	4.34	0.6374
) 21	0.8892	+3.430	−0.008	345 21.7	23 1.4	29 2.1	1 56.1	1.36285	1.30170	+4.22	+0.6250
22	0.8919	3.440	−0.005	345 31.4	23 2.1	28 4.1	1 52.3	1.36431	1.30226	4.09	0.6121
23	0.8947	3.451	0.000	345 39.1	23 2.6	27 6.2	1 48.4	1.36596	1.30280	3.97	0.5986
24	0.8974	3.462	+0.004	345 44.2	23 2.9	26 8.4	1 44.6	1.36766	1.30333	3.84	0.5846
25	0.9002	3.472	0.008	345 47.1	23 3.1	25 10.8	1 40.7	1.36935	1.30384	3.72	0.5700
26	0.9029	+3.483	+0.009	345 47.9	23 3.2	24 13.2	1 36.9	1.37088	1.30434	+3.59	+0.5547
27	0.9056	3.494	0.009	345 47.5	23 3.2	23 15.8	1 33.1	1.37219	1.30484	3.46	0.5387
28	0.9084	3.505	0.006	345 46.9	23 3.1	22 18.5	1 29.2	1.37323	1.30531	3.33	0.5219
29	0.9111	3.516	+0.001	345 47.2	23 3.1	21 21.3	1 25.4	1.37399	1.30577	3.19	0.5043
30	0.9138	3.527	−0.005	345 49.6	23 3.3	20 24.1	1 21.6	1.37452	1.30620	3.06	0.4858
c. 1	0.9166	+3.538	−0.011	345 55.0	23 3.7	19 27.1	1 17.8	1.37497	1.30663	+2.93	+0.4664
2	0.9193	3.550	0.016	346 3.6	23 4.2	18 30.2	1 14.0	1.37551	1.30704	2.79	0.4458
3	0.9220	3.561	0.018	346 14.9	23 5.0	17 33.3	1 10.2	1.37631	1.30743	2.66	0.4242
4	0.9248	3.572	0.016	346 27.4	23 5.8	16 36.5	1 6.4	1.37751	1.30781	2.52	0.4012
5	0.9275	3.584	0.011	346 39.4	23 6.6	15 39.8	1 2.7	1.37916	1.30816	2.38	0.3768
0) 6	0.9302	+3.595	−0.004	346 49.2	23 7.3	14 43.2	0 58.9	1.38117	1.30850	+2.24	+0.3507
7	0.9330	3.607	+0.005	346 55.7	23 7.7	13 46.6	0 55.1	1.38342	1.30882	2.10	0.3229
8	0.9357	3.618	0.013	346 58.3	23 7.9	12 50.1	0 51.3	1.38563	1.30911	1.96	0.2930
9	0.9385	3.630	0.018	346 57.8	23 7.9	11 53.7	0 47.6	1.38762	1.30938	1.82	0.2608
10	0.9412	3.642	0.019	346 55.5	23 7.7	10 57.3	0 43.8	1.38923	1.30965	1.68	0.2257
11	0.9439	+3.654	+0.017	346 53.0	23 7.5	10 0.9	0 40.1	1.39043	1.30989	+1.54	+0.1875
12	0.9467	3.665	0.012	346 52.1	23 7.5	9 4.7	0 36.3	1.39126	1.31010	1.40	0.1454
13	0.9494	3.677	+0.005	346 53.6	23 7.6	8 8.5	0 32.6	1.39182	1.31030	1.26	0.0987
14	0.9522	3.689	−0.002	346 58.2	23 7.9	7 12.3	0 28.8	1.39231	1.31047	1.11	0.0461
15	0.9549	3.701	0.007	347 5.3	23 8.4	6 16.1	0 25.1	1.39289	1.31063	0.97	9.9861
16	0.9576	+3.713	−0.010	347 14.2	23 8.9	5 20.0	0 21.3	1.39369	1.31076	+0.83	+9.9163
17	0.9604	3.725	0.010	347 23.6	23 9.6	4 23.9	0 17.6	1.39476	1.31088	0.68	9.8329
18	0.9631	3.736	0.009	347 32.4	23 10.2	3 27.8	0 13.9	1.39610	1.31098	0.54	9.7294
19	0.9658	3.748	0.005	347 39.9	23 10.7	2 31.8	0 10.1	1.39771	1.31104	0.39	9.5931
h 20	0.9686	3.760	−0.001	347 45.3	23 11.0	1 35.8	0 6.4	1.39942	1.31109	0.25	9.3931
.0) 21	0.9713	+3.772	+0.004	347 48.7	23 11.2	0 39.7	0 2.6	1.40121	1.31111	+0.10	+9.0107
22	0.9741	3.784	0.007	347 49.4	23 11.3	359 43.6	23 58.9	1.40300	1.31111	−0.04	−8.6260
23	0.9768	3.796	0.010	347 48.3	23 11.2	358 47.6	23 55.2	1.40463	1.31110	0.19	9.2719
24	0.9795	3.808	0.010	347 45.9	23 11.1	357 51.5	23 51.4	1.40610	1.31107	0.33	9.5208
25	0.9823	3.820	0.008	347 43.1	23 10.9	356 55.4	23 47.7	1.40730	1.31100	0.48	9.6780
26	0.9850	+3.832	+0.003	347 40.8	23 10.7	355 59.3	23 44.0	1.40824	1.31092	−0.62	−9.7931
27	0.9878	3.844	−0.003	347 40.0	23 10.7	355 3.1	23 40.2	1.40891	1.31081	0.76	9.8838
28	0.9905	3.856	0.009	347 41.8	23 10.8	354 6.9	23 36.5	1.40948	1.31069	0.91	9.9588
29	0.9932	3.868	0.015	347 46.4	23 11.1	353 10.7	23 32.7	1.41007	1.31055	1.05	0.0226
30	0.9960	3.880	0.018	347 53.6	23 11.6	352 14.4	23 29.0	1.41084	1.31038	1.20	0.0780
31	0.9987	+3.892	−0.018	348 2.3	23 12.2	351 18.1	23 25.2	1.41194	1.31019	−1.34	−0.1271
32	1.0014	+3.903	−0.014	348 11.0	23 12.7	350 21.7	23 21.4	1.41344	1.30998	−1.48	−0.1711

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)	Log *A*.	Log *B*.	Log *C*.	Log
July 1	+9.86196	−0.8173	+0.47963	−1.30544	Aug. 16	+9.93928	−0.8373	+1.17729	−1.08
2	9.86292	0.8181	0.52183	1.30420	17	9.94098	0.8349	1.18265	1.07
3	9.86385	0.8175	0.56018	1.30284	18	9.94320	0.8332	1.18782	1.06
4	9.86500	0.8157	0.59531	1.30135	19	9.94570	0.8329	1.19281	1.05
5	9.86650	0.8133	0.62770	1.29974	20	9.94828	0.8342	1.19762	1.04
h 6	+9.86847	−0.8107	+0.65774	−1.29800	h 21	+9.95057	−0.8369	+1.20226	−1.03
(19.0) 7	9.87080	0.8083	0.68572	1.29613	(22.0) 22	9.95237	0.8406	1.20673	1.02
8	9.87348	0.8067	0.71189	1.29414	23	9.95359	0.8444	1.21104	1.01
9	9.87637	0.8060	0.73647	1.29201	24	9.95432	0.8477	1.21518	0.997
10	9.87934	0.8064	0.75961	1.28975	25	9.95466	0.8498	1.21917	0.98
11	+9.88220	−0.8081	+0.78147	−1.28736	26	+9.95484	−0.8505	+1.22300	−0.97
12	9.88483	0.8107	0.80217	1.28483	27	9.95508	0.8500	1.22667	0.955
13	9.88703	0.8139	0.82182	1.28217	28	9.95555	0.8485	1.23019	0.940
14	9.88875	0.8173	0.84050	1.27937	29	9.95634	0.8464	1.23357	0.92
15	9.88999	0.8201	0.85830	1.27643	30	9.95748	0.8444	1.23679	0.90
16	+9.89088	−0.8219	+0.87528	−1.27335	31	+9.95892	−0.8427	+1.23988	−0.890
17	9.89162	0.8222	0.89150	1.27012	Sept. 1	9.96059	0.8418	1.24282	0.87
18	9.89247	0.8212	0.90703	1.26675	2	9.96238	0.8417	1.24561	0.852
19	9.89375	0.8189	0.92190	1.26324	3	9.96418	0.8427	1.24827	0.83
20	9.89565	0.8160	0.93617	1.25957	4	9.96584	0.8446	1.25079	0.81
h 21	+9.89818	−0.8134	+0.94986	−1.25574	h 5	+9.96728	−0.8472	+1.25317	−0.78
(20.0) 22	9.90120	0.8120	0.96302	1.25177	(23.0) 6	9.96838	0.8501	1.25542	0.764
23	9.90448	0.8121	0.97568	1.24763	7	9.96908	0.8529	1.25753	0.7387
24	9.90764	0.8139	0.98787	1.24333	8	9.96945	0.8550	1.25951	0.7113
25	9.91041	0.8172	0.99960	1.23887	9	9.96957	0.8559	1.26136	0.6819
26	+9.91262	−0.8212	+1.01092	−1.23423	10	+9.96965	−0.8555	+1.26308	−0.6502
27	9.91417	0.8252	1.02183	1.22943	11	9.96994	0.8537	1.26466	0.6158
28	9.91520	0.8282	1.03235	1.22444	12	9.97060	0.8509	1.26611	0.5783
29	9.91588	0.8301	1.04252	1.21928	13	9.97178	0.8478	1.26744	0.5372
30	9.91644	0.8306	1.05233	1.21393	14	9.97347	0.8451	1.26864	0.4915
31	+9.91713	−0.8299	+1.06182	−1.20839	15	+9.97551	−0.8436	+1.26971	−0.4404
Aug. 1	9.91810	0.8283	1.07098	1.20265	16	9.97764	0.8436	1.27065	0.38221
2	9.91942	0.8264	1.07984	1.19671	17	9.97964	0.8451	1.27146	0.31484
3	9.92112	0.8246	1.08841	1.19056	18	9.98128	0.8477	1.27215	0.23485
4	9.92313	0.8233	1.09669	1.18420	19	9.98236	0.8506	1.27271	0.13651
h 5	+9.92535	−0.8229	+1.10470	−1.17762	h 20	+9.98295	−0.8533	+1.27314	−0.00896
(21.0) 6	9.92767	0.8236	1.11246	1.17081	(0.0) 21	9.98316	0.8549	1.27345	9.82733
7	9.92996	0.8253	1.11995	1.16377	22	9.98315	0.8552	1.27363	−9.50850
8	9.93207	0.8280	1.12721	1.15648	23	9.98316	0.8542	1.27368	+8.43650
9	9.93384	0.8313	1.13423	1.14895	24	9.98337	0.8520	1.27361	9.57658
10	+9.93521	−0.8349	+1.14102	−1.14115	25	+9.98388	−0.8492	+1.27341	+9.86165
11	9.93614	0.8382	1.14758	1.13309	26	9.98474	0.8461	1.27308	0.03229
12	9.93670	0.8406	1.15393	1.12475	27	9.98592	0.8433	1.27262	0.15444
13	9.93707	0.8417	1.16007	1.11611	28	9.98732	0.8411	1.27204	0.24963
14	9.93746	0.8414	1.16601	1.10717	29	9.98889	0.8398	1.27132	0.32759
15	+9.93811	−0.8397	+1.17175	−1.09792	30	+9.99048	−0.8395	+1.27048	+0.39360
16	+9.93928	−0.8373	+1.17729	−1.08834	Oct. 1	+9.99202	−0.8401	+1.26951	+0.45080

$E = +0''.03 = +0^s.002$

FOR WASHINGTON MEAN MIDNIGHT.

Day. Hr.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.	Solar Day. (Sid. Hr.)		Log *A*.	Log *B*.	Log *C*.	Log *D*.
	1	+9.99202	−0.8401	+1.26951	+0.45080	Nov.	16	+0.04130	−0.7868	+1.04521	+1.21784
	2	9.99334	0.8415	1.26840	0.50126		17	0.04178	0.7836	1.03458	1.22334
	3	9.99441	0.8434	1.26717	0.54638		18	0.04250	0.7794	1.02354	1.22864
	4	9.99514	0.8452	1.26580	0.58715		19	0.04351	0.7746	1.01207	1.23374
	5	9.99555	0.8465	1.26429	0.62433	h	20	0.04487	0.7697	1.00015	1.23865
	6	+9.99572	−0.8468	+1.26265	+0.65847	(4.0)	21	+0.04650	−0.7655	+0.98774	+1.24337
	7	9.99581	0.8458	1.26088	0.69003		22	0.04828	0.7622	0.97483	1.24792
	8	9.99603	0.8433	1.25896	0.71934		23	0.05017	0.7601	0.96138	1.25228
	9	9.99657	0.8397	1.25691	0.74669		24	0.05205	0.7592	0.94735	1.25647
	10	9.99757	0.8355	1.25471	0.77231		25	0.05382	0.7595	0.93270	1.26048
	11	+9.99909	−0.8314	+1.25238	+0.79640		26	+0.05538	−0.7606	+0.91740	+1.26433
	12	0.00100	0.8283	1.24990	0.81910		27	0.05668	0.7622	0.90139	1.26801
	13	0.00312	0.8266	1.24727	0.84057		28	0.05770	0.7635	0.88462	1.27152
	14	0.00514	0.8266	1.24449	0.86091		29	0.05847	0.7641	0.86703	1.27488
	15	0.00690	0.8279	1.24157	0.88022		30	0.05908	0.7634	0.84855	1.27807
	16	+0.00819	−0.8299	+1.23849	+0.89860	Dec.	1	+0.05970	−0.7612	+0.82910	+1.28111
	17	0.00900	0.8318	1.23526	0.91611		2	0.06051	0.7573	0.80858	1.28399
	18	0.00937	0.8329	1.23187	0.93283		3	0.06166	0.7524	0.78689	1.28672
	19	0.00954	0.8326	1.22832	0.94881		4	0.06324	0.7471	0.76391	1.28930
h	20	0.00964	0.8310	1.22460	0.96410	h	5	0.06525	0.7424	0.73949	1.29173
2.0)	21	+0.00989	−0.8280	+1.22072	+0.97876	(5.0)	6	+0.06756	−0.7391	+0.71347	+1.29400
	22	0.01042	0.8241	1.21667	0.99282		7	0.07000	0.7379	0.68563	1.29614
	23	0.01130	0.8199	1.21245	1.00631		8	0.07229	0.7387	0.65574	1.29812
	24	0.01250	0.8158	1.20806	1.01928		9	0.07427	0.7409	0.62348	1.29996
	25	0.01397	0.8122	1.20348	1.03176		10	0.07581	0.7438	0.58847	1.30166
	26	+0.01560	−0.8096	+1.19872	+1.04376		11	+0.07693	−0.7463	+0.55024	+1.30322
	27	0.01730	0.8080	1.19376	1.05532		12	0.07773	0.7476	0.50815	1.30463
	28	0.01898	0.8074	1.18862	1.06646		13	0.07834	0.7474	0.46139	1.30590
	29	0.02050	0.8078	1.18328	1.07720		14	0.07896	0.7454	0.40882	1.30703
	30	0.02178	0.8088	1.17773	1.08755		15	0.07975	0.7421	0.34882	1.30803
	31	+0.02278	−0.8100	+1.17197	+1.09754		16	+0.08081	−0.7380	+0.27903	+1.30888
Nov.	1	0.02348	0.8109	1.16600	1.10718		17	0.08214	0.7337	0.19565	1.30960
	2	0.02393	0.8108	1.15981	1.11649		18	0.08373	0.7301	0.09217	1.31018
	3	0.02428	0.8094	1.15339	1.12548		19	0.08552	0.7273	9.95586	1.31062
	4	0.02470	0.8065	1.14673	1.13416	h	20	0.08741	0.7259	9.75584	1.31092
h	5	+0.02538	−0.8022	+1.13983	+1.14255	(6.0)	21	+0.08929	−0.7258	+9.37345	+1.31108
(3.0)	6	0.02647	0.7971	1.13269	1.15065		22	0.09110	0.7271	−8.98868	1.31111
	7	0.02806	0.7919	1.12528	1.15847		23	0.09270	0.7294	9.63466	1.31100
	8	0.03005	0.7874	1.11760	1.16603		24	0.09410	0.7322	9.88358	1.31076
	9	0.03233	0.7845	1.10965	1.17333		25	0.09522	0.7351	0.04073	1.31037
	10	+0.03461	−0.7833	+1.10141	+1.18038		26	+0.09610	−0.7374	−0.15580	+1.30985
	11	0.03670	0.7838	1.09286	1.18719		27	0.09675	0.7385	0.24657	1.30919
	12	0.03837	0.7854	1.08401	1.19376		28	0.09737	0.7380	0.32150	1.30840
	13	0.03960	0.7873	1.07483	1.20011		29	0.09808	0.7360	0.38528	1.30746
	14	0.04041	0.7885	1.06532	1.20624		30	0.09905	0.7325	0.44077	1.30638
	15	+0.04089	−0.7884	+1.05545	+1.21215		31	+0.10039	−0.7284	−0.48985	+1.30516
	16	+0.04130	−0.7868	+1.04521	+1.21784		32	+0.10212	−0.7247	−0.53382	+1.30380

$E = +0''.03 = +0^s.002$

[Eph 15]

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f	f′	G	G	H	H	Log g.	Log h.	i	Log
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
Jan. 0	−0.0006	+0.554	+0.001	296 33.8	19 46.3	351 4.3	23 24.3	0.90782	1.31013	−1.38	−0.13
1	+0.0021	0.567	0.006	297 11.0	19 48.7	350 7.9	23 20.5	0.91166	1.30992	1.52	0.18
2	0.0048	0.578	0.010	297 40.7	19 50.7	349 11.5	23 16.8	0.91600	1.30969	1.66	0.2
3	0.0076	0.590	0.011	298 1.8	19 52.1	348 15.0	23 13.0	0.92043	1.30943	1.80	0.255
h 4	0.0103	0.602	0.009	298 15.4	19 53.0	347 18.4	23 9.2	0.92433	1.30916	1.94	0.2
(7.0) 5	0.0130	+0.614	+0.004	298 24.6	19 53.6	346 21.8	23 5.5	0.92732	1.30886	−2.08	−0.31
6	0.0158	0.626	−0.002	298 33.1	19 54.2	345 25.0	23 1.7	0.92914	1.30854	2.22	0.34
7	0.0185	0.638	0.009	298 45.4	19 55.0	344 28.2	22 57.9	0.92980	1.30821	2.36	0.37
8	0.0213	0.649	0.014	299 5.3	19 56.4	343 31.3	22 54.1	0.92968	1.30786	2.50	0.397
9	0.0240	0.661	0.016	299 34.4	19 58.3	342 34.3	22 50.3	0.92933	1.30749	2.64	0.4
10	0.0267	+0.672	−0.015	300 13.1	20 0.9	341 37.2	22 46.5	0.92947	1.30710	−2.77	−0.443
11	0.0295	0.684	0.010	300 57.5	20 3.8	340 40.0	22 42.7	0.93062	1.30669	2.91	0.463
12	0.0322	0.695	−0.003	301 42.7	20 6.8	339 42.7	22 38.8	0.93315	1.30626	3.04	0.48
13	0.0350	0.706	+0.005	302 23.8	20 9.6	338 45.3	22 35.0	0.93698	1.30581	3.18	0.50
14	0.0377	0.718	0.012	302 56.0	20 11.7	337 47.7	22 31.2	0.94167	1.30535	3.31	0.52
15	0.0404	+0.729	+0.017	303 18.5	20 13.2	336 50.1	22 27.3	0.94663	1.30488	−3.44	−0.537
16	0.0432	0.740	0.018	303 31.3	20 14.1	335 52.3	22 23.5	0.95131	1.30439	3.57	0.553
17	0.0459	0.751	0.016	303 38.1	20 14.5	334 54.4	22 19.6	0.95512	1.30389	3.70	0.5686
18	0.0486	0.762	0.011	303 41.7	20 14.8	333 56.4	22 15.8	0.95796	1.30337	3.83	0.5834
19	0.0514	0.773	+0.005	303 45.8	20 15.1	332 58.3	22 11.9	0.95977	1.30284	3.96	0.5976
h 20	0.0541	+0.784	−0.002	303 53.3	20 15.6	331 59.9	22 8.0	0.96076	1.30230	−4.08	−0.61
(8.0) 21	0.0569	0.795	0.007	304 5.8	20 16.4	331 1.5	22 4.1	0.96120	1.30174	4.21	0.6242
22	0.0596	0.805	0.011	304 24.1	20 17.6	330 3.0	22 0.2	0.96148	1.30117	4.33	0.6368
23	0.0623	0.816	0.013	304 47.6	20 19.2	329 4.3	21 56.3	0.96195	1.30059	4.45	0.6488
24	0.0651	0.826	0.012	305 15.0	20 21.0	328 5.4	21 52.4	0.96289	1.30000	4.57	0.6604
25	0.0678	+0.836	−0.010	305 44.6	20 23.0	327 6.5	21 48.4	0.96450	1.29939	−4.69	−0.6715
26	0.0706	0.847	−0.006	306 14.2	20 24.9	326 7.4	21 44.5	0.96694	1.29878	4.81	0.6822
27	0.0733	0.857	0.000	306 41.1	20 26.7	325 8.1	21 40.5	0.97018	1.29816	4.93	0.6926
28	0.0760	0.867	+0.005	307 3.5	20 28.2	324 8.6	21 36.6	0.97407	1.29754	5.04	0.7025
29	0.0788	0.877	0.009	307 19.7	20 29.3	323 9.1	21 32.6	0.97836	1.29690	5.15	0.7121
30	0.0815	+0.887	+0.011	307 29.0	20 29.9	322 9.3	21 28.6	0.98263	1.29626	−5.26	−0.7214
31	0.0842	0.897	0.010	307 32.1	20 30.1	321 9.4	21 24.6	0.98645	1.29562	5.37	0.7303
Feb. 1	0.0870	0.906	0.007	307 31.5	20 30.1	320 9.4	21 20.6	0.98947	1.29496	5.48	0.7389
2	0.0897	0.916	+0.001	307 30.3	20 30.0	319 9.1	21 16.6	0.99146	1.29431	5.59	0.7472
3	0.0924	0.925	−0.006	307 32.6	20 30.2	318 8.8	21 12.6	0.99246	1.29365	5.69	0.7552
h 4	0.0952	+0.935	−0.012	307 41.1	20 30.7	317 8.2	21 8.5	0.99272	1.29299	−5.79	−0.7629
(9.0) 5	0.0979	0.944	0.015	307 57.8	20 31.9	316 7.5	21 4.5	0.99271	1.29232	5.89	0.7704
6	0.1007	0.953	0.015	308 22.3	20 33.5	315 6.5	21 0.4	0.99301	1.29167	5.99	0.7776
7	0.1034	0.962	0.012	308 52.2	20 35.5	314 5.5	20 56.4	0.99412	1.29101	6.09	0.7845
8	0.1061	0.971	−0.005	309 23.1	20 37.5	313 4.2	20 52.3	0.99631	1.29034	6.18	0.7912
9	0.1089	+0.980	+0.003	309 50.8	20 39.4	312 2.8	20 48.2	0.99956	1.28968	−6.28	−0.7977
10	0.1116	0.989	0.010	310 11.5	20 40.8	311 1.2	20 44.1	1.00356	1.28902	6.37	0.8039
11	0.1144	0.997	0.016	310 23.6	20 41.6	309 59.4	20 40.0	1.00781	1.28836	6.46	0.8100
12	0.1171	1.006	0.018	310 27.8	20 41.9	308 57.6	20 35.9	1.01178	1.28772	6.54	0.8157
13	0.1198	1.015	0.016	310 26.4	20 41.8	307 55.5	20 31.7	1.01508	1.28708	6.63	0.8213
14	0.1226	+1.023	+0.012	310 22.5	20 41.5	306 53.3	20 27.6	1.01748	1.28645	−6.71	−0.8267
15	0.1253	+1.031	+0.007	310 19.5	20 41.3	305 50.9	20 23.4	1.01898	1.28581	−6.79	−0.8319

FOR WASHINGTON MEAN MIDNIGHT.

·Day. ereal ar.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
. 15	0.1253	+1.031	+0.007	310 19.5	20 41.3	305 50.9	20 23.4	1.01898	1.28581	−6.79	−0.8319
16	0.1280	1.040	0.000	310 19.4	20 41.3	304 48.3	20 19.2	1.01967	1.28519	6.87	0.8368
17	0.1308	1.048	−0.006	310 24.3	20 41.6	303 45.6	20 15.0	1.01987	1.28456	6.94	0.8416
18	0.1335	1.056	0.010	310 34.5	20 42.3	302 42.7	20 10.8	1.01985	1.28396	7.02	0.8462
19 t	0.1363	1.064	0.013	310 49.4	20 43.3	301 39.8	20 6.6	1.01995	1.28336	7.09	0.8506
.0)20	0.1390	+1.071	−0.013	311 8.1	20 44.5	300 36.7	20 2.4	1.02042	1.28279	−7.16	−0.8549
21	0.1417	1.079	0.011	311 28.6	20 45.9	299 33.4	19 58.2	1.02146	1.28222	7.23	0.8589
22	0.1445	1.087	0.007	311 49.3	20 47.3	298 30.1	19 54.0	1.02312	1.28166	7.29	0.8628
23	0.1472	1.095	−0.002	312 8.4	20 48.6	297 26.5	19 49.8	1.02548	1.28111	7.35	0.8665
24	0.1500	1.102	+0.003	312 23.8	20 49.6	296 22.9	19 45.5	1.02842	1.28058	7.42	0.8701
25	0.1527	+1.110	+0.008	312 34.2	20 50.3	295 19.1	19 41.3	1.03167	1.28006	−7.47	−0.8735
26	0.1554	1.117	0.010	312 38.7	20 50.6	294 15.3	19 37.0	1.03496	1.27957	7.53	0.8767
27	0.1582	1.124	0.010	312 38.2	20 50 5	293 11.3	19 32.8	1.03792	1.27909	7.58	0.8798
28	0.1609	1.131	0.008	312 34.5	20 50.3	292 7.2	19 28.5	1.04025	1.27861	7.63	0.8827
r. 1	0.1636	1.139	+0.003	312 30.1	20 50.0	291 3.0	19 24.2	1.04171	1.27816	7.68	0.8854
2	0.1664	+1.146	−0.003	312 28.5	20 49.9	289 58.7	19 19.9	1.04228	1.27773	−7.73	−0.8880
3	0.1691	1.153	0.009	312 32.4	20 50.2	288 54.3	19 15.6	1.04217	1.27732	7.77	0.8905
4	0.1718	1.160	0.014	312 43.6	20 50.9	287 49.8	19 11.3	1.04170	1.27693	7.81	0.8928
5	0.1746	1.167	0.015	313 2.1	20 52.1	286 45.2	19 7.0	1.04140	1.27656	7.85	0.8950
h 6	0.1773	1.174	0.012	313 26.0	20 53.7	285 40.6	19 2.7	1.04174	1.27621	7.89	0.8970
1.0) 7	0.1801	+1.181	−0.007	313 51.9	20 55.5	284 35.9	18 58.4	1.04296	1.27588	−7.92	−0.8989
8	0.1828	1.188	+0.001	314 15.6	20 57.0	283 31.1	18 54.1	1.04516	1.27557	7.96	0.9006
9	0.1855	1.194	0.009	314 33.6	20 58.2	282 26.3	18 49.8	1.04808	1.27529	7.98	0.9022
10	0.1883	1.201	0.015	314 44.4	20 59.0	281 21.4	18 45.4	1.05130	1.27502	8.01	0.9037
11	0.1910	1.208	0.018	314 47.8	20 59.2	280 16.4	18 41.1	1.05438	1.27478	8.04	0.9050
12	0.1938	+1.214	+0.018	314 45.8	20 59.1	279 11.5	18 36.8	1.05690	1.27456	−8.06	−0.9062
13	0.1965	1.221	0.014	314 41.3	20 58.7	278 6.5	18 32.4	1.05862	1.27436	8.08	0.9073
14	0.1992	1.228	0.008	314 37.2	20 58.5	277 1.4	18 28.1	1.05947	1.27419	8.09	0.9082
15	0.2020	1.234	+0.002	314 36.2	20 58.4	275 56.4	18 23.8	1.05963	1.27406	8.11	0.9090
16	0.2047	1.241	−0.004	314 40.0	20 58.7	274 51.4	18 19.4	1.05927	1.27394	8.12	0.9096
17	0.2074	+1.248	−0.009	314 48.7	20 59.2	273 46.3	18 15.1	1.05869	1.27383	−8.13	−0.9102
18	0.2102	1.254	0.012	315 2.5	21 0.2	272 41.3	18 10.8	1.05821	1.27376	8.14	0.9106
19	0.2129	1.261	0.013	315 20.1	21 1.3	271 36.3	18 6.4	1.05802	1.27371	8.14	0.9108
20	0.2156	1.267	0.012	315 39.7	21 2.6	270 31.3	18 2.1	1.05834	1.27369	8.15	0.9109
h 21	0.2184	1.274	0.009	315 59.7	21 4.0	269 26.4	17 57.8	1.05926	1.27368	8.15	0.9109
12.0)22	0.2211	+1.280	−0.004	316 18.5	21 5.2	268 21.5	17 53.4	1.06075	1.27371	−8.14	−0.9108
23	0.2239	1.287	+0.001	316 34.1	21 6.3	267 16.6	17 49.1	1.06280	1.27376	8.14	0.9105
24	0.2266	1.293	0.006	316 45.4	21 7.0	266 11.9	17 44.8	1.06518	1.27383	8.13	0.9101
25	0.2293	1.300	0.009	316 52.0	21 7.5	265 7.2	17 40.5	1.06769	1.27393	8.12	0.9096
26	0.2321	1.306	0.010	316 53.8	21 7.6	264 2.6	17 36.2	1.06996	1.27405	8.11	0.9090
27	0.2348	+1.313	+0.008	316 52.5	21 7.5	262 58.0	17 31.9	1.07175	1.27420	−8.09	−0.9082
28	0.2376	1.320	+0.004	316 50.5	21 7.4	261 53.5	17 27.6	1.07279	1.27436	8.08	0.9073
29	0.2403	1.326	−0.002	316 50.4	21 7.4	260 49.2	17 23.3	1.07303	1.27455	8.06	0.9062
30	0.2430	1.333	0.008	316 55.5	21 7.7	259 44.9	17 19.0	1.07263	1.27478	8.04	0.9050
31	0.2458	1.340	0.013	317 7.3	21 8.5	258 40.7	17 14.7	1.07190	1.27502	8.01	0.9038
Apr. 1	0.2485	+1.346	−0.015	317 26.4	21 9.8	257 36.7	17 10.4	1.07125	1.27527	−7.99	−0.9023
2	0.2512	+1.353	−0.013	317 51.2	21 11.4	256 32.7	17 6.2	1.07112	1.27555	−7.96	−0.9007

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f	f′	G	G	H	H	Log g.	Log k.	i	Lo
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
Apr. 1	0.2485	+1.346	−0.015	317 26.4	21 9.8	257 36.7	17 10.4	1.07125	1.27527	−7.99	−0.9
2	0.2512	1.353	0.013	317 51.2	21 11.4	256 32.7	17 6.2	1.07112	1.27555	7.96	0.9
3	0.2540	1.360	0.008	318 18.5	21 13.2	255 28.9	17 1.9	1.07182	1.27585	7.93	0.8
4	0.2567	1.367	−0.001	318 44.5	21 15.0	254 25.2	16 57.7	1.07339	1.27618	7.89	0.8
5	0.2595	1.374	+0.007	319 5.7	21 16.4	253 21.6	16 53.4	1.07573	1.27652	7.86	0.8
h 6	0.2622	+1.381	+0.014	319 20.4	21 17.4	252 18.2	16 49.2	1.07846	1.27688	−7.82	−0.8
(13.0) 7	0.2649	1.388	0.018	319 27.9	21 17.9	251 14.9	16 45.0	1.08113	1.27726	7.78	0.8
8	0.2677	1.395	0.019	319 29.8	21 18.0	250 11.7	16 40.8	1.08332	1.27766	7.74	0.88
9	0.2704	1.402	0.016	319 28.7	21 17.9	249 8.7	16 36.6	1.08479	1.27808	7.69	0.88
10	0.2732	1.409	0.011	319 27.9	21 17.9	248 5.8	16 32.4	1.08548	1.27852	7.64	0.88
11	0.2759	+1.416	+0.004	319 29.5	21 18.0	247 3.2	16 28.2	1.08547	1.27897	−7.59	−0.88
12	0.2786	1.423	−0.002	319 36.0	21 18.4	246 0.7	16 24.0	1.08500	1.27944	7.54	0.87
13	0.2814	1.431	0.008	319 47.5	21 19.2	244 58.3	16 19.9	1.08429	1.27992	7.49	0.87
14	0.2841	1.438	0.012	320 4.0	21 20.3	243 56.1	16 15.7	1.08366	1.28042	7.43	0.87
15	0.2868	1.445	0.013	320 24.3	21 21.6	242 54.1	16 11.6	1.08338	1.28094	7.37	0.86
16	0.2896	+1.453	−0.012	320 46.7	21 23.1	241 52.3	16 7.5	1.08354	1.28146	−7.31	−0.86
17	0.2923	1.460	0.010	321 9.2	21 24.6	240 50.7	16 3.4	1.08431	1.28200	7.25	0.86
18	0.2950	1.468	−0.005	321 31.4	21 26.1	239 49.2	15 59.3	1.08562	1.28255	7.19	0.85
19	0.2978	1.476	0.000	321 50.1	21 27.3	238 48.0	15 55.2	1.08744	1.28311	7.12	0.85
20	0.3005	1.484	+0.004	322 4.8	21 28.3	237 47.0	15 51.1	1.08964	1.28368	7.05	0.84
h 21	0.3033	+1.492	+0.008	322 15.0	21 29.0	236 46.1	15 47.1	1.09194	1.28426	−6.98	−0.84
(14.0) 22	0.3060	1.499	0.009	322 20.6	21 29.4	235 45.5	15 43.0	1.09413	1.28485	6.91	0.83
23	0.3087	1.508	0.008	322 22.7	21 29.5	234 45.0	15 39.0	1.09589	1.28545	6.84	0.83
24	0.3115	1.516	+0.004	322 24.4	21 29.6	233 44.8	15 35.0	1.09702	1.28606	6.76	0.82
25	0.3142	1.524	−0.001	322 27.4	21 29.8	232 44.8	15 31.0	1.09747	1.28667	6.68	0.82
26	0.3170	+1.532	−0.007	322 35.0	21 30.3	231 45.0	15 27.0	1.09736	1.28728	−6.60	−0.81
27	0.3197	1.540	0.013	322 48.7	21 31.2	230 45.3	15 23.0	1.09689	1.28791	6.52	0.81
28	0.3224	1.549	0.016	323 9.3	21 32.6	229 45.9	15 19.1	1.09651	1.28853	6.44	0.80
29	0.3252	1.557	0.015	323 35.7	21 34.4	228 46.7	15 15.1	1.09660	1.28915	6.35	0.80
30	0.3279	1.566	0.011	324 5.0	21 36.3	227 47.7	15 11.2	1.09746	1.28978	6.26	0.79
May 1	0.3306	+1.575	−0.004	324 33.2	21 38.1	226 48.9	15 7.3	1.09925	1.29041	−6.17	−0.79
2	0.3334	1.583	+0.004	324 58.0	21 39.9	225 50.3	15 3.4	1.10171	1.29104	6.08	0.78
3	0.3361	1.592	0.012	325 15.9	21 41.1	224 51.8	14 59.5	1.10462	1.29168	5.99	0.777
4	0.3389	1.601	0.018	325 27.0	21 41.8	223 53.6	14 55.6	1.10756	1.29232	5.90	0.770
5	0.3416	1.610	0.020	325 32.2	21 42.1	222 55.6	14 51.7	1.11006	1.29295	5.80	0.763
h 6	0.3443	+1.619	+0.018	325 34.1	21 42.3	221 57.7	14 47.8	1.11193	1.29358	−5.70	−0.756
(15.0) 7	0.3471	1.628	0.014	325 35.7	21 42.4	221 0.1	14 44.0	1.11303	1.29421	5.60	0.748
8	0.3498	1.638	+0.007	325 39.5	21 42.6	220 2.6	14 40.2	1.11348	1.29483	5.50	0.740
9	0.3526	1.647	0.000	325 47.5	21 43.2	219 5.3	14 36.4	1.11345	1.29545	5.40	0.732
10	0.3553	1.656	−0.006	326 0.5	21 44.0	218 8.2	14 32.5	1.11321	1.29607	5.30	0.724
11	0.3580	+1.666	−0.010	326 18.2	21 45.2	217 11.3	14 28.8	1.11307	1.29668	−5.19	−0.715
12	0.3608	1.676	0.012	326 39.5	21 46.6	216 14.6	14 25.0	1.11324	1.29729	5.08	0.706
13	0.3635	1.685	0.012	327 2.8	21 48.2	215 18.1	14 21.2	1.11390	1.29789	4.98	0.697
14	0.3662	1.695	0.010	327 26.3	21 49.7	214 21.7	14 17.4	1.11508	1.29848	4.87	0.687
15	0.3690	1.705	0.006	327 48.4	21 51.2	213 25.6	14 13.7	1.11682	1.29907	4.76	0.677
16	0.3717	+1.715	−0.001	328 7.6	21 52.5	212 29.5	14 10.0	1.11901	1.29964	−4.65	−0.667
17	0.3744	+1.725	+0.003	328 22.8	21 53.5	211 33.7	14 6.2	1.12152	1.30021	−4.53	−0.656

FOR WASHINGTON MEAN MIDNIGHT.

Day. ereal ur.)	τ	f	f′	G	G	H	H	Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
r 17	0.3744	+1.725	+0.003	328 22.8	21 53.5	211 33.7	14 6.2	1.12152	1.30021	−4.53	−0.6563
18	0.3772	1.735	0.007	328 33.6	21 54.2	210 38.0	14 2.5	1.12415	1.30077	4.42	0.6452
19	0.3799	1.745	0.009	328 40.1	21 54.7	209 42.5	13 58.8	1.12665	1.30131	4.30	0.6337
20	0.3827	1.755	0.009	328 43.2	21 54.9	208 47.2	13 55.1	1.12882	1.30185	4.18	0.6218
21	0.3854	1.766	+0.005	328 45.1	21 55.0	207 52.0	13 51.5	1.13047	1.30238	4.07	0.6093
0)22	0.3881	+1.776	0.000	328 48.1	21 55.2	206 57.0	13 47.8	1.13149	1.30289	−3.95	−0.5964
23	0.3909	1.786	−0.006	328 54.8	21 55.7	206 2.1	13 44.1	1.13200	1.30339	3.83	0.5830
24	0.3936	1.797	0.012	329 6.7	21 56.4	205 7.4	13 40.5	1.13218	1.30388	3.71	0.5691
25	0.3964	1.808	0.016	329 25.0	21 57.7	204 12.8	13 36.9	1.13242	1.30435	3.58	0.5546
26	0.3991	1.818	0.017	329 48.7	21 59.2	203 18.4	13 33.2	1.13308	1.30482	3.46	0.5394
27	0.4018	+1.829	−0.014	330 15.3	22 1.0	202 24.1	13 29.6	1.13444	1.30527	−3.34	−0.5236
28	0.4046	1.840	−0.008	330 41.6	22 2.8	201 29.9	13 26.0	1.13661	1.30570	3.21	0.5070
29	0.4073	1.850	+0.001	331 4.2	22 4.3	200 35.9	13 22.4	1.13951	1.30613	3.09	0.4897
30	0.4100	1.861	0.009	331 21.0	22 5.4	199 41.9	13 18.8	1.14283	1.30653	2.96	0.4715
31	0.4128	1.872	0.016	331 31.2	22 6.1	198 48.1	13 15.2	1.14620	1.30691	2.83	0.4524
ne 1	0.4155	+1.883	+0.019	331 35.6	22 6.4	197 54.4	13 11.6	1.14922	1.30729	−2.71	−0.4324
2	0.4183	1.894	0.019	331 36.6	22 6.4	197 0.8	13 8.1	1.15166	1.30764	2.58	0.4112
3	0.4210	1.906	0.016	331 36.9	22 6.5	196 7.3	13 4.5	1.15339	1.30799	2.45	0.3888
4	0.4237	1.917	0.010	331 38.8	22 6.6	195 13.9	13 0.9	1.15448	1.30832	2.32	0.3651
h 5	0.4265	1.928	+0.003	331 44.4	22 7.0	194 20.5	12 57.4	1.15509	1.30863	2.19	0.3399
.0) 6	0.4292	+1.939	−0.003	331 54.4	22 7.6	193 27.3	12 53.8	1.15550	1.30892	−2.06	−0.3130
7	0.4320	1.950	0.008	332 8.6	22 8.6	192 34.1	12 50.3	1.15596	1.30919	1.92	0.2842
8	0.4347	1.962	0.011	332 26.1	22 9.7	191 41.1	12 46.7	1.15667	1.30945	1.79	0.2532
9	0.4374	1.973	0.011	332 45.4	22 11.0	190 48.0	12 43.2	1.15782	1.30969	1.66	0.2197
10	0.4402	1.984	0.010	333 4.6	22 12.3	189 55.1	12 39.7	1.15943	1.30991	1.52	0.1833
11	0.4429	+1.996	−0.007	333 22.6	22 13.5	189 2.2	12 36.1	1.16152	1.31011	−1.39	−0.1435
12	0.4456	2.007	−0.002	333 38.0	22 14.5	188 9.4	12 32.6	1.16403	1.31030	1.26	0.0995
13	0.4484	2.019	+0.003	333 49.7	22 15.3	187 16.6	12 29.1	1.16678	1.31047	1.12	0.0504
14	0.4511	2.030	0.007	333 57.3	22 15.8	186 23.9	12 25.6	1.16965	1.31062	0.99	9.9949
15	0.4538	2.042	0.009	334 0.9	22 16.1	185 31.2	12 22.1	1.17243	1.31074	0.85	9.9311
16	0.4566	+2.053	+0.010	334 1.2	22 16.1	184 38.5	12 18.6	1.17491	1.31086	−0.72	−9.8563
17	0.4593	2.065	0.007	334 0.1	22 16.0	183 45.9	12 15.1	1.17689	1.31095	0.58	9.7656
18	0.4621	2.076	+0.002	333 59.5	22 16.0	182 53.4	12 11.6	1.17833	1.31101	0.45	9.6508
19	0.4648	2.088	−0.004	334 1.4	22 16.1	182 0.8	12 8.1	1.17928	1.31106	0.31	9.4941
20	0.4675	2.099	0.010	334 8.1	22 16.5	181 8.3	12 4.6	1.17993	1.31110	0.18	9.2464
h 21	0.4703	+2.111	−0.016	334 20.1	22 17.3	180 15.8	12 1.1	1.18054	1.31111	−0.04	−8.6101
18.0)22	0.4730	2.122	0.018	334 36.9	22 18.5	179 23.3	11 57.6	1.18147	1.31111	+0.10	+8.9770
23	0.4758	2.134	0.016	334 56.8	22 19.8	178 30.8	11 54.1	1.18298	1.31110	0.23	9.3625
24	0.4785	2.145	0.011	335 16.8	22 21.1	177 38.3	11 50.6	1.18520	1.31105	0.37	9.5633
25	0.4812	2.157	−0.003	335 34.2	22 22.3	176 45.8	11 47.1	1.18808	1.31099	0.50	9.7000
26	0.4840	+2.169	+0.005	335 46.5	22 23.1	175 53.3	11 43.6	1.19137	1.31091	+0.64	+9.8037
27	0.4867	2.180	0.013	335 53.1	22 23.5	175 0.8	11 40.1	1.19479	1.31081	0.77	9.8873
28	0.4894	2.192	0.018	335 54.3	22 23.6	174 8.2	11 36.5	1.19797	1.31070	0.91	9.9572
29	0.4922	2.203	0.019	335 51.8	22 23.5	173 15.6	11 33.0	1.20060	1.31056	1.04	0.0173
30	0.4949	2.214	0.017	335 48.3	22 23.2	172 23.0	11 29.5	1.20263	1.31040	1.18	0.0700
July 1	0.4977	+2.226	+0.012	335 46.0	22 23.1	171 30.4	11 26.0	1.20404	1.31023	+1.31	+0.1169
2	0.5004	+2.237	+0.005	335 46.6	22 23.1	170 37.7	11 22.5	1.20496	1.31004	+1.44	+0.1591

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	*f*	*f′*	*G*		*H*		Log *g*.	Log *h*.	*i*	Log
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
July 1	0.4977	+2.226	+0.012	335 46.0	22 23.1	171 30.4	11 26.0	1.20404	1.31023	+1.31	+0.1
2	0.5004	2.237	+0.005	335 46.6	22 23.1	170 37.7	11 22.5	1.20496	1.31004	1.44	0.1
3	0.5031	2.249	−0.001	335 51.1	22 23.4	169 44.9	11 19.0	1.20564	1.30983	1.58	0.1
4	0.5059	2.260	0.006	335 59.6	22 24.0	168 52.1	11 15.5	1.20631	1.30960	1.71	0.2
5	0.5086	2.271	0.010	336 11.1	22 24.7	167 59.2	11 11.9	1.20716	1.30936	1.84	0.2
h 6	0.5114	+2.283	−0.011	336 24.5	22 25.6	167 6.3	11 8.4	1.20839	1.30909	+1.97	+0.2
(19.0) 7	0.5141	2.294	0.010	336 38.1	22 26.5	166 13.3	11 4.9	1.20997	1.30881	2.10	0.3
8	0.5168	2.305	0.007	336 50.5	22 27.4	165 20.2	11 1.3	1.21198	1.30852	2.23	0.3
9	0.5196	2.316	−0.003	337 0.7	22 28.0	164 27.0	10 57.8	1.21433	1.30820	2.36	0.37
10	0.5223	2.327	+0.002	337 7.9	22 28.5	163 33.7	10 54.2	1.21692	1.30787	2.49	0.3
11	0.5250	+2.338	+0.006	337 11.4	22 28.8	162 40.4	10 50.7	1.21959	1.30752	+2.62	+0.4
12	0.5278	2.349	0.009	337 11.4	22 28.8	161 47.0	10 47.1	1.22222	1.30716	2.75	0.4
13	0.5305	2.360	0.010	337 8.5	22 28.6	160 53.5	10 43.6	1.22457	1.30679	2.88	0.4
14	0.5332	2.371	0.009	337 3.9	22 28.3	159 59.8	10 40.0	1.22654	1.30639	3.00	0.47
15	0.5360	2.382	+0.005	336 59.3	22 28.0	159 6.1	10 36.4	1.22802	1.30598	3.13	0.4
16	0.5387	+2.393	−0.001	336 56.7	22 27.8	158 12.3	10 32.8	1.22905	1.30555	+3.26	+0.51
17	0.5415	2.404	0.008	336 57.9	22 27.9	157 18.3	10 29.2	1.22972	1.30511	3.38	0.5
18	0.5442	2.414	0.014	337 3.4	22 28.2	156 24.3	10 25.6	1.23028	1.30466	3.50	0.54
19	0.5469	2.425	0.017	337 13.5	22 28.9	155 30.1	10 22.0	1.23102	1.30420	3.62	0.5
20	0.5497	2.435	0.017	337 26.9	22 29.8	154 35.8	10 18.4	1.23222	1.30373	3.74	0.57
h 21	0.5524	+2.446	−0.013	337 41.1	22 30.7	153 41.4	10 14.8	1.23400	1.30324	+3.86	+0.5
(20.0) 22	0.5552	2.457	−0.007	337 53.6	22 31.6	152 46.9	10 11.1	1.23638	1.30274	3.98	0.6
23	0.5579	2.466	+0.002	338 2.3	22 32.2	151 52.2	10 7.5	1.23921	1.30222	4.10	0.61
24	0.5606	2.476	0.009	338 5.8	22 32.4	150 57.4	10 3.8	1.24220	1.30169	4.22	0.6
25	0.5634	2.487	0.015	338 4.4	22 32.3	150 2.4	10 0.2	1.24501	1.30116	4.33	0.63
26	0.5661	+2.497	+0.018	337 59.6	22 32.0	149 7.3	9 56.5	1.24749	1.30061	+4.45	+0.64
27	0.5688	2.507	0.017	337 52.9	22 31.5	148 12.0	9 52.8	1.24939	1.30006	4.56	0.65
28	0.5716	2.517	0.013	337 47.2	22 31.1	147 16.6	9 49.1	1.25071	1.29949	4.67	0.66
29	0.5743	2.527	+0.007	337 44.0	22 30.9	146 21.0	9 45.4	1.25156	1.29892	4.78	0.679
30	0.5771	2.536	0.000	337 44.2	22 31.0	145 25.3	9 41.7	1.25211	1.29834	4.89	0.689
31	0.5798	+2.546	−0.005	337 48.1	22 31.2	144 29.4	9 38.0	1.25259	1.29775	+5.00	+0.6991
Aug. 1	0.5825	2.556	0.009	337 55.2	22 31.7	143 33.3	9 34.2	1.25320	1.29716	5.11	0.7082
2	0.5853	2.565	0.011	338 4.1	22 32.3	142 37.1	9 30.5	1.25406	1.29656	5.21	0.7171
3	0.5880	2.575	0.010	338 13.7	22 32.9	141 40.6	9 26.7	1.25528	1.29595	5.32	0.7257
4	0.5908	2.584	0.008	338 22.6	22 33.5	140 44.0	9 22.9	1.25684	1.29534	5.42	0.7340
h 5	0.5935	+2.594	−0.004	338 29.6	22 34.0	139 47.2	9 19.1	1.25871	1.29472	+5.52	+0.7420
(21.0) 6	0.5962	2.603	+0.001	338 34.1	22 34.3	138 50.2	9 15.3	1.26081	1.29410	5.62	0.7497
7	0.5990	2.612	0.005	338 35.7	22 34.4	137 53.1	9 11.5	1.26302	1.29347	5.72	0.7572
8	0.6017	2.621	0.009	338 34.1	22 34.3	136 55.8	9 7.7	1.26521	1.29284	5.81	0.7645
9	0.6044	2.630	0.011	338 29.9	22 34.0	135 58.2	9 3.9	1.26718	1.29223	5.91	0.7715
10	0.6072	+2.639	+0.010	338 23.8	22 33.6	135 0.5	9 0.0	1.26886	1.29160	+6.00	+0.7783
11	0.6099	2.647	0.007	338 17.4	22 33.2	134 2.7	8 56.2	1.27011	1.29097	6.09	0.7848
12	0.6126	2.656	+0.002	338 12.4	22 32.8	133 4.6	8 52.3	1.27092	1.29034	6.18	0.7912
13	0.6153	2.665	−0.005	338 10.4	22 32.7	132 6.3	8 48.4	1.27140	1.28971	6.27	0.7973
14	0.6181	2.673	0.011	338 12.4	22 32.8	131 7.8	8 44.5	1.27168	1.28909	6.36	0.8033
15	0.6209	+2.682	−0.015	338 18.6	22 33.2	130 9.2	8 40.6	1.27202	1.28847	+6.44	+0.8090
16	0.6236	+2.690	−0.017	338 28.3	22 33.9	129 10.4	8 36.7	1.27270	1.28785	+6.52	+0.8146

FOR WASHINGTON MEAN MIDNIGHT.

ar Day. idereal lour.)	r	f	f'	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
g. 16	0.6236	+2.690	−0.017	338 28.3	22 33.9	129 10.4	8 36.7	1.27270	1.28785	+6.52	+0.8146
17	0.6263	2.698	0.014	338 39.3	22 34.6	128 11.4	8 32.8	1.27386	1.28725	6.61	0.8199
18	0.6291	2.707	0.009	338 49.9	22 35.3	127 12.2	8 28.8	1.27556	1.28664	6.68	0.8251
19	0.6318	2.715	−0.001	338 57.4	22 35.8	126 12.8	8 24.8	1.27769	1.28603	6.76	0.8301
20	0.6346	2.723	+0.007	339 0.8	22 36.1	125 13.2	8 20.9	1.28011	1.28543	6.84	0.8349
h 21	0.6373	+2.731	+0.013	338 59.5	22 36.0	124 13.5	8 16.9	1.28246	1.28484	+6.91	+0.8395
.0) 22	0.6400	2.739	0.017	338 54.6	22 35.6	123 13.6	8 12.9	1.28450	1.28426	6.98	0.8440
23	0.6428	2.746	0.017	338 47.6	22 35.2	122 13.5	8 8.9	1.28606	1.28369	7.05	0.8483
24	0.6455	2.754	0.014	338 41.0	22 34.7	121 13.2	8 4.9	1.28712	1.28312	7.12	0.8524
25	0.6482	2.762	0.008	338 36.2	22 34.4	120 12.7	8 0.8	1.28769	1.28257	7.18	0.8564
26	0.6510	+2.769	+0.002	338 34.7	22 34.3	119 12.0	7 56.8	1.28794	1.28202	+7.25	+0.8603
27	0.6537	2.777	−0.004	338 36.8	22 34.5	118 11.2	7 52.7	1.28808	1.28149	7.31	0.8639
28	0.6565	2.784	0.009	338 42.1	22 34.8	117 10.2	7 48.7	1.28829	1.28097	7.37	0.8675
29	0.6592	2.792	0.011	338 49.6	22 35.3	116 9.0	7 44.6	1.28872	1.28047	7.43	0.8708
30	0.6619	2.799	0.011	338 58.2	22 35.9	115 7.7	7 40.5	1.28944	1.27997	7.48	0.8741
31	0.6647	+2.806	−0.009	339 6.4	22 36.4	114 6.1	7 36.4	1.29048	1.27950	+7.54	+0.8772
pt. 1	0.6674	2.814	0.006	339 13.3	22 36.9	113 4.4	7 32.3	1.29181	1.27903	7.59	0.8801
2	0.6702	2.821	−0.001	339 18.1	22 37.2	112 2.5	7 28.2	1.29337	1.27857	7.64	0.8829
3	0.6729	2.828	+0.004	339 20.3	22 37.3	111 0.5	7 24.0	1.29508	1.27814	7.68	0.8855
4	0.6756	2.835	0.008	339 19.7	22 37.2	109 58.4	7 19.9	1.29676	1.27773	7.73	0.8881
h 5	0.6784	+2.842	+0.010	339 16.6	22 37.1	108 56.0	7 15.7	1.29835	1.27733	+7.77	+0.8904
.0) 6	0.6811	2.849	0.010	339 11.8	22 36.8	107 53.5	7 11.6	1.29968	1.27695	7.81	0.8927
7	0.6838	2.855	0.008	339 6.3	22 36.4	106 50.9	7 7.4	1.30064	1.27659	7.85	0.8948
8	0.6866	2.862	+0.004	339 1.8	22 36.1	105 48.2	7 3.2	1.30123	1.27625	7.88	0.8968
9	0.6893	2.869	−0.003	338 59.6	22 36.0	104 45.3	6 59.0	1.30146	1.27593	7.92	0.8986
10	0.6920	+2.876	−0.009	339 1.0	22 36.1	103 42.3	6 54.8	1.30147	1.27563	+7.95	+0.9004
11	0.6948	2.882	0.014	339 6.5	22 36.4	102 39.1	6 50.6	1.30149	1.27534	7.98	0.9019
12	0.6975	2.889	0.016	339 15.5	22 37.0	101 35.9	6 46.4	1.30172	1.27507	8.00	0.9034
13	0.7003	2.896	0.015	339 26.8	22 37.8	100 32.6	6 42.2	1.30236	1.27483	8.03	0.9047
14	0.7030	2.902	0.010	339 38.1	22 38.5	99 29.2	6 38.0	1.30353	1.27462	8.05	0.9059
15	0.7057	+2.909	−0.003	339 47.2	22 39.1	98 25.6	6 33.7	1.30514	1.27442	+8.07	+0.9070
16	0.7085	2.915	+0.005	339 52.7	22 39.5	97 22.0	6 29.5	1.30701	1.27425	8.09	0.9079
17	0.7112	2.922	0.012	339 54.0	22 39.6	96 18.4	6 25.2	1.30895	1.27410	8.11	0.9088
18	0.7140	2.928	0.016	339 51.6	22 39.4	95 14.6	6 21.0	1.31070	1.27397	8.12	0.9094
19	0.7167	2.935	0.017	339 46.7	22 39.1	94 10.8	6 16.7	1.31201	1.27387	8.13	0.9100
h 20	0.7194	+2.941	+0.015	339 41.5	22 38.8	93 6.9	6 12.5	1.31284	1.27379	+8.14	+0.9104
.0) 21	0.7222	2.948	0.010	339 37.8	22 38.5	92 3.0	6 8.2	1.31323	1.27373	8.14	0.9107
22	0.7249	2.954	+0.003	339 36.9	22 38.5	90 59.0	6 3.9	1.31325	1.27369	8.15	0.9109
23	0.7276	2.960	−0.003	339 39.7	22 38.6	89 55.0	5 59.7	1.31314	1.27368	8.15	0.9109
24	0.7304	2.967	0.008	339 45.7	22 39.0	88 50.9	5 55.4	1.31307	1.27370	8.14	0.9109
25	0.7331	+2.973	−0.011	339 54.4	22 39.6	87 46.9	5 51.1	1.31317	1.27374	+8.14	+0.9107
26	0.7359	2.980	0.012	340 4.3	22 40.3	86 42.8	5 46.8	1.31358	1.27379	8.14	0.9104
27	0.7386	2.986	0.010	340 14.4	22 41.0	85 38.6	5 42.6	1.31429	1.27387	8.13	0.9099
28	0.7413	2.993	0.007	340 23.4	22 41.6	84 34.5	5 38.3	1.31529	1.27398	8.12	0.9093
29	0.7441	2.999	−0.002	340 30.6	22 42.0	83 30.3	5 34.0	1.31654	1.27412	8.10	0.9086
30	0.7468	+3.006	+0.002	340 35.4	22 42.4	82 26.2	5 29.7	1.31791	1.27428	+8.09	+0.9078
Oct. 1	0.7496	+3.012	+0.006	340 37.7	22 42.5	81 22.1	5 25.5	1.31935	1.27446	+8.07	+0.9068

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f In Time.	f′ In Time.	G In Arc.	G In Time.	H In Arc.	H In Time.	Log g.	Log h.	i	Log
		y	s	s	° ′	h m	° ′	h m			″	
Oct.	1	0.7496	+3.012	+0.006	340 37.7	22 42.5	81 22.1	5 25.5	1.31935	1.27446	+8.07	+0.9
	2	0.7523	3.019	0.009	340 37.5	22 42.5	80 18.0	5 21.2	1.32067	1.27465	8.05	0.9
	3	0.7550	3.025	0.010	340 35.5	22 42.4	79 13.9	5 16.9	1.32184	1.27488	8.03	0.9
	4	0.7578	3.032	0.008	340 32.8	22 42.2	78 9.8	5 12.7	1.32269	1.27514	8.00	0.9
h	5	0.7605	3.039	+0.004	340 30.5	22 42.0	77 5.7	5 8.4	1.32320	1.27540	7.97	0.9
(1.0)	6	0.7632	+3.045	−0.001	340 30.1	22 42.0	76 1.7	5 4.1	1.32339	1.27569	+7.94	+0.8
	7	0.7660	3.052	0.007	340 32.9	22 42.2	74 57.8	4 59.9	1.32335	1.27601	7.91	0.8
	8	0.7687	3.059	0.012	340 39.6	22 42.6	73 53.9	4 55.6	1.32328	1.27634	7.88	0.8
	9	0.7714	3.066	0.015	340 49.9	22 43.3	72 50.1	4 51.3	1.32336	1.27669	7.84	0.8
	10	0.7742	3.072	0.015	341 2.7	22 44.2	71 46.4	4 47.1	1.32380	1.27706	7.80	0.8
	11	0.7769	+3.079	−0.011	341 16.2	22 45.1	70 42.7	4 42.8	1.32474	1.27746	+7.76	+0.8
	12	0.7797	3.086	−0.005	341 28.2	22 45.9	69 39.1	4 38.6	1.32614	1.27788	7.71	0.8
	13	0.7824	3.093	+0.003	341 37.2	22 46.5	68 35.6	4 34.4	1.32788	1.27831	7.67	0.8
	14	0.7851	3.100	0.011	341 42.0	22 46.8	67 32.3	4 30.2	1.32970	1.27876	7.62	0.8
	15	0.7879	3.107	0.016	341 43.1	22 46.9	66 29.0	4 25.9	1.33142	1.27923	7.57	0.87
	16	0.7906	+3.115	+0.018	341 41.4	22 46.8	65 25.8	4 21.7	1.33277	1.27971	+7.51	+0.87
	17	0.7934	3.122	0.017	341 38.8	22 46.6	64 22.7	4 17.5	1.33369	1.28021	7.46	0.87
	18	0.7961	3.129	0.012	341 37.2	22 46.5	63 19.8	4 13.3	1.33413	1.28072	7.40	0.86
	19	0.7988	3.137	+0.006	341 38.2	22 46.5	62 17.0	4 9.1	1.33426	1.28125	7.34	0.86
h	20	0.8016	3.144	−0.001	341 42.4	22 46.8	61 14.2	4 4.9	1.33418	1.28180	7.28	0.86
(2.0)	21	0.8043	+3.152	−0.007	341 50.0	22 47.3	60 11.6	4 0.8	1.33412	1.28235	+7.21	+0.8
	22	0.8070	3.159	0.010	342 0.2	22 48.0	59 9.1	3 56.6	1.33422	1.28292	7.14	0.85
	23	0.8098	3.167	0.012	342 12.1	22 48.8	58 6.8	3 52.5	1.33462	1.28350	7.08	0.84
	24	0.8125	3.175	0.011	342 24.3	22 49.6	57 4.7	3 48.3	1.33533	1.28409	7.00	0.845
	25	0.8153	3.182	0.008	342 35.4	22 50.4	56 2.6	3 44.2	1.33635	1.28469	6.93	0.840
	26	0.8180	+3.190	−0.004	342 45.3	22 51.0	55 0.7	3 40.0	1.33760	1.28530	+6.86	+0.836
	27	0.8207	3.198	+0.001	342 52.6	22 51.5	53 58.9	3 35.9	1.33901	1.28591	6.78	0.831
	28	0.8235	3.207	0.005	342 57.6	22 51.8	52 57.2	3 31.8	1.34050	1.28654	6.70	0.825
	29	0.8262	3.215	0.008	343 0.1	22 52.0	51 55.7	3 27.7	1.34192	1.28717	6.62	0.8206
	30	0.8290	3.223	0.009	343 0.6	22 52.0	50 54.4	3 23.6	1.34318	1.28780	6.53	0.8150
	31	0.8317	+3.232	+0.008	343 0.3	22 52.0	49 53.2	3 19.5	1.34419	1.28844	+6.45	+0.8092
Nov.	1	0.8344	3.240	+0.005	342 59.9	22 52.0	48 52.1	3 15.5	1.34490	1.28909	6.36	0.8033
	2	0.8372	3.249	0.000	343 1.0	22 52.1	47 51.2	3 11.4	1.34532	1.28974	6.27	0.7971
	3	0.8399	3.257	−0.006	343 4.8	22 52.3	46 50.4	3 7.4	1.34552	1.29040	6.18	0.7907
	4	0.8426	3.266	0.012	343 12.2	22 52.8	45 49.8	3 3.3	1.34565	1.29105	6.08	0.7840
h	5	0.8454	+3.275	−0.016	343 23.0	22 53.4	44 49.2	2 59.3	1.34593	1.29171	+5.98	+0.7771
(3.0)	6	0.8481	3.284	0.016	343 36.4	22 54.4	43 48.9	2 55.3	1.34651	1.29237	5.89	0.7700
	7	0.8508	3.293	0.014	343 50.9	22 55.4	42 48.8	2 51.3	1.34757	1.29303	5.79	0.7626
	8	0.8536	3.302	−0.008	344 4.4	22 56.3	41 48.7	2 47.3	1.34907	1.29368	5.69	0.7549
	9	0.8563	3.311	0.000	344 15.4	22 57.0	40 48.8	2 43.3	1.35095	1.29433	5.58	0.7460
	10	0.8591	+3.321	+0.008	344 22.4	22 57.4	39 49.1	2 39.3	1.35299	1.29498	+5.48	+0.7387
	11	0.8618	3.330	0.015	344 25.7	22 57.7	38 49.6	2 35.3	1.35492	1.29563	5.37	0.7301
	12	0.8645	3.340	0.019	344 25.7	22 57.7	37 50.2	2 31.3	1.35659	1.29626	5.26	0.7213
	13	0.8673	3.349	0.018	344 24.6	22 57.6	36 50.9	2 27.4	1.35790	1.29690	5.15	0.7121
	14	0.8700	3.359	0.015	344 23.8	22 57.4	35 51.8	2 23.5	1.35874	1.29753	5.04	0.7026
	15	0.8728	+3.369	+0.009	344 24.9	22 57.5	34 52.9	2 19.5	1.35918	1.29816	+4.93	+0.6927
	16	0.8755	+3.379	+0.002	344 29.1	22 57.9	33 54.1	2 15.6	1.35944	1.29877	+4.81	+0.6825

FOR WASHINGTON MEAN MIDNIGHT.

r Day. ereal our.)	τ	f	f′	G	G	H	H	Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
. 16	0.8755	+3.379	+0.002	344 29.1	22 57.9	33 54.1	2 15.6	1.35944	1.29877	+4.81	+0.6825
17	0.8782	3.389	−0.004	344 36.4	22 58.4	32 55.4	2 11.7	1.35967	1.29937	4.70	0.6718
18	0.8810	3.399	0.009	344 46.5	22 59.1	31 56.8	2 7.8	1.36002	1.29996	4.58	0.6608
19	0.8837	3.409	0.011	344 58.1	22 59.9	30 58.4	2 3.9	1.36065	1.30055	4.46	0.6493
20	0.8864	3.420	0.011	345 10.3	23 0.7	30 0.2	2 0.0	1.36160	1.30113	4.34	0.6374
) 21	0.8892	+3.430	−0.008	345 21.7	23 1.4	29 2.1	1 56.1	1.36285	1.30170	+4.22	+0.6250
22	0.8919	3.440	−0.005	345 31.4	23 2.1	28 4.1	1 52.3	1.36431	1.30226	4.09	0.6121
23	0.8947	3.451	0.000	345 39.1	23 2.6	27 6.2	1 48.4	1.36596	1.30280	3.97	0.5986
24	0.8974	3.462	+0.004	345 44.2	23 2.9	26 8.4	1 44.6	1.36766	1.30333	3.84	0.5846
25	0.9002	3.472	0.008	345 47.1	23 3.1	25 10.8	1 40.7	1.36935	1.30384	3.72	0.5700
26	0.9029	+3.483	+0.009	345 47.9	23 3.2	24 13.2	1 36.9	1.37088	1.30434	+3.59	+0.5547
27	0.9056	3.494	0.009	345 47.5	23 3.2	23 15.8	1 33.1	1.37219	1.30484	3.46	0.5387
28	0.9084	3.505	0.006	345 46.9	23 3.1	22 18.5	1 29.2	1.37323	1.30531	3.33	0.5219
29	0.9111	3.516	+0.001	345 47.2	23 3.1	21 21.3	1 25.4	1.37399	1.30577	3.19	0.5043
30	0.9138	3.527	−0.005	345 49.6	23 3.3	20 24.1	1 21.6	1.37452	1.30620	3.06	0.4858
c. 1	0.9166	+3.538	−0.011	345 55.0	23 3.7	19 27.1	1 17.8	1.37497	1.30663	+2.93	+0.4664
2	0.9193	3.550	0.016	346 3.6	23 4.2	18 30.2	1 14.0	1.37551	1.30704	2.79	0.4458
3	0.9220	3.561	0.018	346 14.9	23 5.0	17 33.3	1 10.2	1.37631	1.30743	2.66	0.4242
4	0.9248	3.572	0.016	346 27.4	23 5.8	16 36.5	1 6.4	1.37751	1.30781	2.52	0.4012
5	0.9275	3.584	0.011	346 39.4	23 6.6	15 39.8	1 2.7	1.37916	1.30816	2.38	0.3768
0) 6	0.9302	+3.595	−0.004	346 49.2	23 7.3	14 43.2	0 58.9	1.38117	1.30850	.24	+0.3507
7	0.9330	3.607	+0.005	346 55.7	23 7.7	13 46.6	0 55.1	1.38342	1.30882	2.10	0.3229
8	0.9357	3.618	0.013	346 58.3	23 7.9	12 50.1	0 51.3	1.38563	1.30911	1.96	0.2930
9	0.9385	3.630	0.018	346 57.8	23 7.9	11 53.7	0 47.6	1.38762	1.30938	1.82	0.2608
10	0.9412	3.642	0.019	346 55.5	23 7.7	10 57.3	0 43.8	1.38923	1.30965	1.68	0.2257
11	0.9439	+3.654	+0.017	346 53.0	23 7.5	10 0.9	0 40.1	1.39043	1.30989	+1.54	+0.1875
12	0.9467	3.665	0.012	346 52.1	23 7.5	9 4.7	0 36.3	1.39126	1.31010	1.40	0.1454
13	0.9494	3.677	+0.005	346 53.6	23 7.6	8 8.5	0 32.6	1.39182	1.31030	1.26	0.0987
14	0.9522	3.689	−0.002	346 58.2	23 7.9	7 12.3	0 28.8	1.39231	1.31047	1.11	0.0461
15	0.9549	3.701	0.007	347 5.3	23 8.4	6 16.1	0 25.1	1.39289	1.31063	0.97	9.9861
16	0.9576	+3.713	−0.010	347 14.2	23 8.9	5 20.0	0 21.3	1.39369	1.31076	+0.83	+9.9163
17	0.9604	3.725	0.010	347 23.6	23 9.6	4 23.9	0 17.6	1.39476	1.31088	0.68	9.8329
18	0.9631	3.736	0.009	347 32.4	23 10.2	3 27.8	0 13.9	1.39610	1.31098	0.54	9.7294
19	0.9658	3.748	0.005	347 39.9	23 10.7	2 31.8	0 10.1	1.39771	1.31104	0.39	9.5931
20	0.9686	3.760	−0.001	347 45.3	23 11.0	1 35.8	0 6.4	1.39942	1.31109	0.25	9.3931
h .0) 21	0.9713	+3.772	+0.004	347 48.7	23 11.2	0 39.7	0 2.6	1.40121	1.31111	+0.10	+9.0107
22	0.9741	3.784	0.007	347 49.4	23 11.3	359 43.6	23 58.9	1.40300	1.31111	−0.04	−8.6260
23	0.9768	3.796	0.010	347 48.3	23 11.2	358 47.6	23 55.2	1.40463	1.31110	0.19	9.2719
24	0.9795	3.808	0.010	347 45.9	23 11.1	357 51.5	23 51.4	1.40610	1.31107	0.33	9.5208
25	0.9823	3.820	0.008	347 43.1	23 10.9	356 55.4	23 47.7	1.40730	1.31100	0.48	9.6780
26	0.9850	+3.832	+0.003	347 40.8	23 10.7	355 59.3	23 44.0	1.40824	1.31092	−0.62	−9.7931
27	0.9878	3.844	−0.003	347 40.0	23 10.7	355 3.1	23 40.2	1.40891	1.31081	0.76	9.8838
28	0.9905	3.856	0.009	347 41.8	23 10.8	354 6.9	23 36.5	1.40948	1.31069	0.91	9.9588
29	0.9932	3.868	0.015	347 46.4	23 11.1	353 10.7	23 32.7	1.41007	1.31055	1.05	0.0226
30	0.9960	3.880	0.018	347 53.6	23 11.6	352 14.4	23 29.0	1.41084	1.31038	1.20	0.0780
31	0.9987	+3.892	−0.018	348 2.3	23 12.2	351 18.1	23 25.2	1.41194	1.31019	−1.34	−0.1271
32	1.0014	+3.903	−0.014	348 11.0	23 12.7	350 21.7	23 21.4	1.41344	1.30998	−1.48	−0.1711

FOR WASHINGTON SIDEREAL TWELVE HOURS.

Mean Solar Date.	Log A_1.	Log B_1.	Log C.	Log D.	f	G_1	H	Log g_1.	Log h.	L
					s	° ′	° ′			
Jan. 0.72	+9.2573	−0.8651	−0.5110	+1.3045	+0.557	296 19	350 52	0.9126	1.3101	−0
10.70	9.3405	0.8683	0.8100	1.2838	0.674	300 44	341 26	0.9340	1.3070	0
20.67	9.4068	0.8745	0.9761	1.2475	0.786	304 20	331 50	0.9576	1.3022	0
30.64	9.4602	0.8826	1.0853	1.1928	0.888	307 10	322 1	0.9811	1.2962	0
Feb. 9.61	9.5034	0.8910	1.1611	1.1145	0.981	309 23	311 56	1.0029	1.2896	0
19.59	+9.5389	−0.8985	−1.2137	+1.0023	+1.065	311 13	301 34	1.0221	1.2833	−0
Mar. 1.56	9.5685	0.9040	1.2483	0.8323	1.139	312 48	290 59	1.0384	1.2781	0
11.53	9.5940	0.9066	1.2678	+0.5247	1.208	314 18	280 14	1.0519	1.2748	0
21.50	9.6171	0.9057	1.2736	−9.2669	1.274	315 53	269 26	1.0630	1.2737	0
31.48	9.6390	0.9012	1.2665	0.5670	1.340	317 37	258 42	1.0725	1.2750	0
Apr. 10.45	+9.6608	−0.8934	−1.2461	−0.8492	+1.409	319 33	248 9	1.0814	1.2785	−0
20.42	9.6832	0.8827	1.2114	1.0095	1.484	321 42	237 52	1.0905	1.2836	0
30.40	9.7066	0.8700	1.1601	1.1161	1.565	323 59	227 54	1.1006	1.2897	0
May 10.37	9.7310	0.8562	1.0879	1.1909	1.655	326 21	218 16	1.1126	1.2960	0
20.34	9.7561	0.8425	0.9864	1.2439	1.753	328 40	208 56	1.1266	1.3018	0
30.31	+9.7815	−0.8302	−0.8377	−1.2798	+1.859	330 50	199 52	1.1424	1.3065	−0
June 9.28	9.8068	0.8204	0.5898	1.3016	1.971	332 46	190 59	1.1598	1.3096	0.
19.26	9.8312	0.8139	−9.9005	1.3107	2.085	334 23	182 14	1.1782	1.3110	−9.
29.23	9.8546	0.8112	+0.3647	1.3078	2.200	335 42	173 30	1.1969	1.3106	+0.
July 9.20	9.8763	0.8123	0.7293	1.2926	2.313	336 42	164 43	1.2152	1.3083	0.
19.18	+9.8962	−0.8166	+0.9171	−1.2644	+2.422	337 27	155 48	1.2327	1.3044	+0.
29.15	9.9141	0.8232	1.0389	1.2211	2.524	337 58	146 41	1.2490	1.2991	0.
Aug. 8.12	9.9300	0.8310	1.1245	1.1592	2.618	338 20	137 17	1.2638	1.2931	0.
18.09	9.9441	0.8387	1.1857	1.0723	2.703	338 37	127 36	1.2771	1.2869	0.
28.07	9.9564	0.8451	1.2287	0.9473	2.781	338 53	117 37	1.2886	1.2812	0.
Sept. 7.04	+9.9674	−0.8491	+1.2566	−0.7508	+2.852	339 12	107 20	1.2987	1.2768	+0.
17.01	9.9774	0.8500	1.2711	−0.3491	2.919	339 36	96 49	1.3076	1.2742	0.
26.98	9.9869	0.8471	1.2729	+0.0958	2.983	340 7	86 12	1.3156	1.2738	0.
Oct. 6.96	9.9963	0.8402	1.2618	0.6732	3.048	340 48	75 32	1.3232	1.2758	0.
16.93	0.0061	0.8294	1.2371	0.9061	3.118	341 38	64 59	1.3308	1.2799	0.
26.90	+0.0166	−0.8151	+1.1967	+1.0484	+3.194	342 35	54 36	1.3390	1.2855	+0.
Nov. 5.88	0.0279	0.7985	1.1371	1.1456	3.278	343 36	44 26	1.3479	1.2920	0.
15.85	0.0402	0.7806	1.0519	1.2142	3.372	344 39	34 32	1.3580	1.2984	0.
25.82	0.0533	0.7633	0.9278	1.2617	3.476	345 39	24 52	1.3691	1.3040	0.
Dec. 5.79	0.0670	0.7482	0.7320	1.2924	3.587	346 32	15 23	1.3811	1.3083	0.
15.77	+0.0809	−0.7371	+0.3314	+1.3083	+3.704	347 16	6 1	1.3937	1.3107	+0.9
25.74	0.0947	0.7311	−0.0711	1.3102	3.823	347 49	356 42	1.4065	1.3110	−9.7
35.71	+0.1079	−0.7306	−0.6501	+1.2985	+3.941	348 11	347 20	1.4192	1.3092	−0.28

E = +0ˢ.002.

The above numbers give the same reductions from mean to apparent place as are employed in computing the apparent places of the fixed stars, given on pages 287 to 486, from the mean places, given on pages 233 to 250. In order to render exact interpolation possible through intervals of ten days, all short period terms have been omitted.

FOR WASHINGTON MEAN MIDNIGHT.

te.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω
	″	″		″	″		″	″		″	″
0	+0.02	−0.10	Feb. 15	+0.11	+0.10	Apr. 1	−0.24	+0.02	May 17	+0.05	−0.08
1	0.10	0.07	16	0.00	0.10	2	0.21	−0.04	18	0.12	0.06
2	0.16	−0.04	17	−0.10	0.08	3	0.13	0.08	19	0.15	−0.02
3	0.18	+0.01	18	0.17	0.05	4	−0.02	0.11	20	0.14	+0.03
4	0.15	0.06	19	0.21	+0.01	5	+0.11	0.11	21	+0.09	0.07
5	+0.07	0.09	20	0.21	−0.03	6	0.22	0.08	22	0.00	0.10
6	−0.03	0.11	21	0.18	0.07	7	0.29	−0.04	23	−0.10	0.10
7	0.14	0.10	22	0.12	0.09	8	0.31	+0.01	24	0.20	0.09
8	0.23	0.07	23	−0.04	0.10	9	0.26	0.06	25	0.26	+0.05
9	0.27	+0.02	24	+0.05	0.09	10	0.18	0.09	26	0.27	0.00
10	−0.24	−0.04	25	+0.12	−0.06	11	+0.07	+0.10	27	−0.22	−0.05
11	0.17	0.08	26	0.17	−0.02	12	−0.04	0.09	28	0.12	0.09
12	−0.05	0.11	27	0.17	+0.03	13	0.13	0.07	29	−0.01	0.11
13	+0.09	0.11	28	0.13	0.07	14	0.19	+0.03	30	+0.15	0.10
14	0.20	0.08	Mar. 1	+0.05	0.10	15	0.24	−0.01	31	0.26	0.07
15	0.28	−0.04	2	−0.05	0.11	16	0.20	0.05	June 1	0.31	−0.02
16	0.30	+0.01	3	0.15	0.09	17	0.15	0.08	2	0.31	+0.03
17	0.26	0.06	4	0.22	+0.05	18	0.09	0.10	3	0.26	0.07
18	0.19	0.09	5	0.24	0.00	19	−0.01	0.10	4	0.16	0.10
19	+0.08	0.10	6	0.20	−0.05	20	+0.07	0.08	5	+0.05	0.10
20	−0.02	+0.10	7	−0.11	−0.09	21	+0.12	−0.05	6	−0.05	+0.09
21	0.12	0.07	8	+0.02	0.11	22	0.15	0.00	7	0.13	0.06
22	0.18	+0.04	9	0.14	0.10	23	0.13	+0.04	8	0.18	+0.01
23	0.21	0.00	10	0.24	0.07	24	+0.07	0.08	9	0.19	−0.03
24	0.20	−0.04	11	0.29	−0.02	25	−0.02	0.10	10	0.16	0.06
25	0.16	0.08	12	0.29	+0.03	26	0.12	0.10	11	0.11	0.09
26	0.09	0.10	13	0.23	0.07	27	0.21	0.08	12	−0.03	0.10
27	−0.01	0.10	14	0.14	0.10	28	0.25	+0.03	13	+0.04	0.09
28	+0.08	0.08	15	+0.03	0.10	29	0.24	−0.02	14	0.11	0.07
29	0.15	−0.05	16	−0.07	0.09	30	0.18	0.07	15	0.15	−0.03
30	+0.18	0.00	17	−0.15	+0.06	May 1	−0.06	−0.10	16	+0.16	+0.02
31	0.17	+0.04	18	0.20	+0.02	2	+0.07	0.11	17	0.12	0.06
b. 1	0.11	0.08	19	0.21	−0.02	3	0.20	0.09	18	+0.04	0.09
2	+0.02	0.10	20	0.19	0.06	4	0.29	−0.05	19	−0.06	0.10
3	−0.09	0.10	21	0.14	0.09	5	0.32	0.00	20	0.17	0.09
4	0.19	0.08	22	−0.07	0.10	6	0.30	+0.05	21	0.25	0.06
5	0.25	+0.03	23	+0.02	0.09	7	0.22	0.08	22	0.29	+0.01
6	0.25	−0.02	24	0.09	0.07	8	0.12	0.10	23	0.26	−0.04
7	0.19	0.07	25	0.14	−0.03	9	+0.01	0.10	24	0.18	0.08
8	−0.08	0.10	26	0.16	+0.01	10	−0.09	0.08	25	−0.06	0.11
9	+0.05	−0.11	27	+0.13	+0.06	11	−0.16	+0.04	26	+0.08	−0.10
10	0.17	0.09	28	+0.06	0.09	12	0.20	0.00	27	0.20	0.08
11	0.25	0.05	29	−0.03	0.11	13	0.20	−0.04	28	0.29	−0.04
12	0.29	−0.01	30	0.13	0.10	14	0.16	0.07	29	0.31	+0.02
13	0.27	+0.04	31	0.21	0.06	15	0.10	0.09	30	0.27	0.06
14	0.20	0.08	Apr. 1	0.24	+0.02	16	−0.02	0.10	July 1	0.19	0.09
15	+0.11	+0.10	2	−0.21	−0.04	17	+0.05	−0.08	2	+0.09	+0.1

FOR WASHINGTON SIDEREAL TWELVE HOURS.

Mean Solar Date.	Log A_1.	Log B_1.	Log C.	Log D.	f	G_1	H	Log g_1.	Log k.	Log
					s	° ′	° ′			
Jan. 0.72	+9.2573	−0.8651	−0.5110	+1.3045	+0.557	296 19	350 52	0.9126	1.3101	−0.148
10.70	9.3405	0.8683	0.8100	1.2838	0.674	300 44	341 26	0.9340	1.3070	0.447
20.67	9.4068	0.8745	0.9761	1.2475	0.786	304 20	331 50	0.9576	1.3022	0.613
30.64	9.4602	0.8826	1.0853	1.1928	0.888	307 10	322 1	0.9811	1.2962	0.722
Feb. 9.61	9.5034	0.8910	1.1611	1.1145	0.981	309 23	311 56	1.0029	1.2896	0.798
19.59	+9.5389	−0.8985	−1.2137	+1.0023	+1.065	311 13	301 34	1.0221	1.2833	−0.851
Mar. 1.56	9.5685	0.9040	1.2483	0.8323	1.139	312 48	290 59	1.0384	1.2781	0.885
11.53	9.5940	0.9066	1.2678	+0.5247	1.208	314 18	280 14	1.0519	1.2748	0.905
21.50	9.6171	0.9057	1.2736	−9.2669	1.274	315 53	269 26	1.0630	1.2737	0.910
31.48	9.6390	0.9012	1.2665	0.5670	1.340	317 37	258 42	1.0725	1.2750	0.903
Apr. 10.45	+9.6608	−0.8934	−1.2461	−0.8492	+1.409	319 33	248 9	1.0814	1.2785	−0.883
20.42	9.6832	0.8827	1.2114	1.0095	1.484	321 42	237 52	1.0905	1.2836	0.848
30.40	9.7066	0.8700	1.1601	1.1161	1.565	323 59	227 54	1.1006	1.2897	0.797
May 10.37	9.7310	0.8562	1.0879	1.1909	1.655	326 21	218 16	1.1126	1.2960	0.725
20.34	9.7561	0.8425	0.9864	1.2439	1.753	328 40	208 56	1.1266	1.3018	0.623
30.31	+9.7815	−0.8302	−0.8377	−1.2798	+1.859	330 50	199 52	1.1424	1.3065	−0.475
June 9.28	9.8068	0.8204	0.5898	1.3016	1.971	332 46	190 59	1.1598	1.3096	0.227
19.26	9.8312	0.8139	−9.9005	1.3107	2.085	334 23	182 14	1.1782	1.3110	−9.537
29.23	9.8546	0.8112	+0.3647	1.3078	2.200	335 42	173 30	1.1969	1.3106	+0.00
July 9.20	9.8763	0.8123	0.7293	1.2926	2.313	336 42	164 43	1.2152	1.3083	0.366
19.18	+9.8962	−0.8166	+0.9171	−1.2644	+2.422	337 27	155 48	1.2327	1.3044	+0.554
29.15	9.9141	0.8232	1.0389	1.2211	2.524	337 58	146 41	1.2490	1.2991	0.676
Aug. 8.12	9.9300	0.8310	1.1245	1.1592	2.618	338 20	137 17	1.2638	1.2931	0.761
18.09	9.9441	0.8387	1.1857	1.0723	2.703	338 37	127 36	1.2771	1.2869	0.823
28.07	9.9564	0.8451	1.2287	0.9473	2.781	338 53	117 37	1.2886	1.2812	0.865
Sept. 7.04	+9.9674	−0.8491	+1.2566	−0.7508	+2.852	339 12	107 20	1.2987	1.2768	+0.893
17.01	9.9774	0.8500	1.2711	−0.3491	2.919	339 36	96 49	1.3076	1.2742	0.908
26.98	9.9869	0.8471	1.2729	+0.0958	2.983	340 7	86 12	1.3156	1.2738	0.910
Oct. 6.96	9.9963	0.8402	1.2618	0.6732	3.048	340 48	75 32	1.3232	1.2758	0.899
16.93	0.0061	0.8294	1.2371	0.9061	3.118	341 38	64 59	1.3308	1.2799	0.874
26.90	+0.0166	−0.8151	+1.1967	+1.0484	+3.194	342 35	54 36	1.3390	1.2855	+0.834
Nov. 5.88	0.0279	0.7985	1.1371	1.1456	3.278	343 36	44 26	1.3479	1.2920	0.774
15.85	0.0402	0.7806	1.0519	1.2142	3.372	344 39	34 32	1.3580	1.2984	0.689
25.82	0.0533	0.7633	0.9278	1.2617	3.476	345 39	24 52	1.3691	1.3040	0.565
Dec. 5.79	0.0670	0.7482	0.7320	1.2924	3.587	346 32	15 23	1.3811	1.3083	0.369
15.77	+0.0809	−0.7371	+0.3314	+1.3083	+3.704	347 16	6 1	1.3937	1.3107	+0.968
25.74	0.0947	0.7311	−0.0711	1.3102	3.823	347 49	356 42	1.4065	1.3110	−9.708
35.71	+0.1079	−0.7306	−0.6501	+1.2985	+3.941	348 11	347 20	1.4192	1.3092	−0.287

$E = +0^{s}.002.$

The above numbers give the same reductions from mean to apparent place as are employed in computing the apparent places of the fixed stars, given on pages 287 to 486, from the mean places, given on pages 233 to 250. In order to render exact interpolation ssible through intervals of ten days, all short period terms have been omitted.

FOR WASHINGTON MEAN MIDNIGHT.

ate.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$	Date.	$\delta''\psi$	$\delta''\omega$
	″	″		″	″		″	″		″	″
0	+0.02	−0.10	Feb. 15	+0.11	+0.10	Apr. 1	−0.24	+0.02	May 17	+0.05	−0.08
1	0.10	0.07	16	0.00	0.10	2	0.21	−0.04	18	0.12	0.06
2	0.16	−0.04	17	−0.10	0.08	3	0.13	0.08	19	0.15	−0.02
3	0.18	+0.01	18	0.17	0.05	4	−0.02	0.11	20	0.14	+0.03
4	0.15	0.06	19	0.21	+0.01	5	+0.11	0.11	21	+0.09	0.07
5	+0.07	0.09	20	0.21	−0.03	6	0.22	0.08	22	0.00	0.10
6	−0.03	0.11	21	0.18	0.07	7	0.29	−0.04	23	−0.10	0.10
7	0.14	0.10	22	0.12	0.09	8	0.31	+0.01	24	0.20	0.09
8	0.23	0.07	23	−0.04	0.10	9	0.26	0.06	25	0.26	+0.05
9	0.27	+0.02	24	+0.05	0.09	10	0.18	0.09	26	0.27	0.00
10	−0.24	−0.04	25	+0.12	−0.06	11	+0.07	+0.10	27	−0.22	−0.05
11	0.17	0.08	26	0.17	−0.02	12	−0.04	0.09	28	0.12	0.09
12	−0.05	0.11	27	0.17	+0.03	13	0.13	0.07	29	−0.01	0.11
13	+0.09	0.11	28	0.13	0.07	14	0.19	+0.03	30	+0.15	0.10
14	0.20	0.08	Mar. 1	+0.05	0.10	15	0.24	−0.01	31	0.26	0.07
15	0.28	−0.04	2	−0.05	0.11	16	0.20	0.05	June 1	0.31	−0.02
16	0.30	+0.01	3	0.15	0.09	17	0.15	0.08	2	0.31	+0.03
17	0.26	0.06	4	0.22	+0.05	18	0.09	0.10	3	0.26	0.07
18	0.19	0.09	5	0.24	0.00	19	−0.01	0.10	4	0.16	0.10
19	+0.08	0.10	6	0.20	−0.05	20	+0.07	0.08	5	+0.05	0.10
20	−0.02	+0.10	7	−0.11	−0.09	21	+0.12	−0.05	6	−0.05	+0.09
21	0.12	0.07	8	+0.02	0.11	22	0.15	0.00	7	0.13	0.06
22	0.18	+0.04	9	0.14	0.10	23	0.13	+0.04	8	0.18	+0.01
23	0.21	0.00	10	0.24	0.07	24	+0.07	0.08	9	0.19	−0.03
24	0.20	−0.04	11	0.29	−0.02	25	−0.02	0.10	10	0.16	0.06
25	0.16	0.08	12	0.29	+0.03	26	0.12	0.10	11	0.11	0.09
26	0.09	0.10	13	0.23	0.07	27	0.21	0.08	12	−0.03	0.10
27	−0.01	0.10	14	0.14	0.10	28	0.25	+0.03	13	+0.04	0.09
28	+0.08	0.08	15	+0.03	0.10	29	0.24	−0.02	14	0.11	0.07
29	0.15	−0.05	16	−0.07	0.09	30	0.18	0.07	15	0.15	−0.03
30	+0.18	0.00	17	−0.15	+0.06	May 1	−0.06	−0.10	16	+0.16	+0.02
31	0.17	+0.04	18	0.20	+0.02	2	+0.07	0.11	17	0.12	0.06
eb. 1	0.11	0.08	19	0.21	−0.02	3	0.20	0.09	18	+0.04	0.09
2	+0.02	0.10	20	0.19	0.06	4	0.29	−0.05	19	−0.06	0.10
3	−0.09	0.10	21	0.14	0.09	5	0.32	0.00	20	0.17	0.09
4	0.19	0.08	22	−0.07	0.10	6	0.30	+0.05	21	0.25	0.06
5	0.25	+0.03	23	+0.02	0.09	7	0.22	0.08	22	0.29	+0.01
6	0.25	−0.02	24	0.09	0.07	8	0.12	0.10	23	0.26	−0.04
7	0.19	0.07	25	0.14	−0.03	9	+0.01	0.10	24	0.18	0.08
8	−0.08	0.10	26	0.16	+0.01	10	−0.09	0.08	25	−0.06	0.11
9	+0.05	−0.11	27	+0.13	+0.06	11	−0.16	+0.04	26	+0.08	−0.10
10	0.17	0.09	28	+0.06	0.09	12	0.20	0.00	27	0.20	0.08
11	0.25	0.05	29	−0.03	0.11	13	0.20	−0.04	28	0.29	−0.04
12	0.29	−0.01	30	0.13	0.10	14	0.16	0.07	29	0.31	+0.02
13	0.27	+0.04	31	0.21	0.06	15	0.10	0.09	30	0.27	0.06
14	0.20	0.08	Apr. 1	0.24	+0.02	16	−0.02	0.10	July 1	0.19	0.09
15	+0.11	+0.10	2	−0.21	−0.04	17	+0.05	−0.08	2	+0.09	+0.10

FOR WASHINGTON MEAN MIDNIGHT.

Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω	Date.	δ″ψ
	″	″		″	″		″	″		″
July 1	+0.19	+0.09	Aug. 16	−0.27	0.00	Oct. 1	+0.10	−0.07	Nov. 16	+0.03
2	+0.09	0.10	17	0.23	−0.05	2	0.14	−0.04	17	−0.07
3	−0.02	0.09	18	0.14	0.09	3	0.16	+0.01	18	0.14
4	0.11	0.07	19	−0.02	0.11	4	0.13	0.05	19	0.18
5	0.16	+0.03	20	+0.11	0.10	5	+0.07	0.08	20	0.17
6	0.18	−0.01	21	0.22	0.07	6	−0.02	0.10	21	0.14
7	0.16	0.05	22	0.27	−0.02	7	0.12	0.10	22	−0.07
8	0.12	0.08	23	0.27	+0.03	8	0.20	0.07	23	0.00
9	−0.05	0.10	24	0.22	0.08	9	0.25	+0.03	24	+0.07
10	+0.03	0.09	25	0.13	0.10	10	0.25	−0.02	25	0.12
11	+0.10	−0.07	26	+0.03	+0.10	11	−0.19	−0.07	26	+0.15
12	0.15	−0.04	27	−0.07	0.08	12	−0.08	0.10	27	0.14
13	0.17	0.00	28	0.14	0.05	13	+0.05	0.11	28	0.10
14	0.15	+0.05	29	0.18	+0.01	14	0.17	0.09	29	+0.02
15	+0.08	0.08	30	0.18	−0.03	15	0.26	−0.05	30	−0.08
16	−0.02	0.10	31	0.15	0.07	16	0.30	0.00	Dec. 1	0.18
17	0.12	0.10	Sept. 1	0.09	0.09	17	0.27	+0.05	2	0.26
18	0.22	0.07	2	−0.02	0.10	18	0.20	0.09	3	0.29
19	0.28	+0.03	3	+0.06	0.09	19	+0.10	0.10	4	0.26
20	0.28	−0.02	4	0.12	0.06	20	−0.01	0.10	5	0.18
21	−0.22	−0.07	5	+0.16	−0.02	21	−0.11	+0.07	6	−0.06
22	−0.11	0.10	6	0.17	+0.02	22	0.17	+0.04	7	+0.08
23	+0.02	0.11	7	0.13	0.06	23	0.19	−0.01	8	0.21
24	0.15	0.09	8	+0.06	0.09	24	0.17	0.05	9	0.29
25	0.25	−0.05	9	−0.04	0.10	25	0.13	0.08	10	0.31
26	0.29	0.00	10	0.14	0.09	26	−0.06	0.09	11	0.27
27	0.27	+0.05	11	0.22	0.06	27	+0.01	0.09	12	0.19
28	0.21	0.08	12	0.26	+0.01	28	0.08	0.08	13	+0.08
29	0.11	0.10	13	0.24	−0.04	29	0.13	0.05	14	−0.03
30	+0.01	0.10	14	0.16	0.08	30	0.15	−0.01	15	0.11
31	−0.09	+0.08	15	−0.05	−0.11	31	+0.14	+0.03	16	−0.16
Aug. 1	0.15	+0.04	16	+0.08	0.10	Nov. 1	+0.08	0.07	17	0.17
2	0.18	0.00	17	0.19	0.08	2	0.00	0.10	18	0.14
3	0.17	−0.04	18	0.27	−0.03	3	−0.10	0.10	19	0.08
4	0.13	0.07	19	0.28	+0.02	4	0.19	0.08	20	−0.01
5	−0.07	0.09	20	0.24	0.06	5	0.26	+0.05	21	+0.06
6	+0.01	0.09	21	0.16	0.09	6	0.27	0.00	22	0.12
7	0.08	0.08	22	+0.05	0.10	7	0.22	−0.05	23	0.16
8	0.14	0.05	23	−0.05	0.09	8	−0.12	0.09	24	0.16
9	0.17	−0.01	24	0.13	0.06	9	+0.01	0.11	25	0.12
10	+0.16	+0.03	25	−0.18	+0.02	10	+0.14	−0.10	26	+0.06
11	0.11	0.07	26	0.19	−0.02	11	0.25	0.06	27	−0.04
12	+0.03	0.10	27	0.16	0.07	12	0.30	−0.02	28	0.15
13	−0.08	0.10	28	0.11	0.08	13	0.30	+0.03	29	0.24
14	0.18	0.09	29	−0.04	0.09	14	0.24	0.08	30	0.29
15	0.25	+0.05	30	+0.03	0.09	15	0.14	0.10	31	0.29
16	−0.27	0.00	Oct. 1	+0.10	−0.07	16	+0.03	+0.10	32	−0.23

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
Piscium	4.7	0	0	59.112	+ 3.0714	− 6	10	59.04	+20.136
Andromedæ (*Alpheratz*)	2.2	0	3	59.450	3.0960	+28	37	16.23	19.880
Cassiopeiæ	2.4	0	4	38.056	3.1851	+58	40	51.55	19.861
Phœnicis	3.9	0	5	5.987	3.0512	−46	12	59.41	19.848
Andromedæ	5.1	0	5	53.898	3.1098	+45	35	57.38	20.034
Pegasi	2.9	0	8	51.420	+ 3.0865	+14	42	39.81	+20.021
Andromedæ	4.5	0	13	52.995	3.1276	+36	18	50.41	19.962
Ceti	3.8	0	15	5.845	3.0569	− 9	17	42.12	19.973
Tucanæ	4.3	0	15	39.189	3.1477	−65	22	26.29	21.171
Piscium	6.0	0	21	2.687	3.0744	+ 1	28	8.31	19.938
Hydri	2.9	0	21	18.226	+ 3.2000	−77	43	58.65	+20.277
Phœnicis	2.4	0	22	5.172	2.9725	−42	46	3.30	19.550
Ceti	6.0	0	25	42.071	3.0622	− 4	25	36.49	19.919
Ceti †	5.2	0	30	52.341	3.0871	− 4	3	38.03	19.847
Cassiopeiæ	3.7	0	32	13.732	3.3288	+53	25	45.39	19.841
Andromedæ	4.4	0	32	20.224	+ 3.1977	+33	15	5.76	+19.847
ε Andromedæ	4.5	0	34	3.624	3.1644	+28	51	1.40	19.571
δ Andromedæ	3.5	0	34	46.744	3.2021	+30	23	45.13	19.718
α Cassiopeiæ (*Schedir*) †	*var.*	0	35	40.497	3.3869	+56	4	16.87	19.771
μ Phœnicis	4.6	0	37	18.605	2.8393	−46	33	6.68	19.749
β Ceti	2.2	0	39	19.419	+ 3.0125	−18	27	10.44	+19.793
ο Cassiopeiæ	4.7	0	39	58.953	3.3314	+47	49	9.82	19.735
ι Cassiopeiæ	5.6	0	40	0.695	3.9060	+74	31	25.22	19.715
ζ Andromedæ	4.3	0	42	49.797	3.1748	+23	48	17.90	19.618
η Cassiopeiæ †	3.6	0	43	56.963	3.6136	+57	21	57.15	19.202
δ Piscium	4.6	0	44	16.251	+ 3.1101	+ 7	7	21.73	+19.629
λ Hydri	5.0	0	45	39.057	2.1010	−75	23	8.87	19.649
20 Ceti	4.9	0	48	39.747	3.0642	− 1	36	19.65	19.592
γ Cassiopeiæ	2.2	0	51	34.034	3.5980	+60	15	24.17	19.535
μ Andromedæ	3.9	0	52	1.817	3.3211	+38	2	18.68	19.561
α Sculptoris	4.4	0	54	30.589	+ 2.8904	−29	49	0.63	+19.468
43 H. Cephei	4.5	0	56	54.030	7.6192	+85	48	6.45	19.427
ε Piscium	4.4	0	58	31.808	3.1112	+ 7	25	57.90	19.421
β Phœnicis †	3.4	1	2	17.447	2.6798	−47	10	26.62	19.286
μ Cassiopeiæ	5.3	1	2	36.265	3.9699	+54	30	14.24	17.747
η Ceti	3.6	1	4	18.827	+ 3.0175	−10	37	56.92	+19.136
β Andromedæ	2.4	1	4	58.060	3.3508	+35	10	12.60	19.129
τ Piscium	4.7	1	6	58.496	3.2972	+29	38	19.22	19.167
ζ Piscium †	5.6	1	9	17.333	3.1319	+ 7	7	34.20	19.084
κ Tucanæ †	5.0	1	12	53.231	2.0395	−69	19	39.52	19.129
f Piscium	5.3	1	13	24.803	+ 3.0926	+ 3	10	1.65	+19.000
υ Piscium	4.7	1	14	47.437	3.2908	+26	49	3.41	18.979
θ Ceti	3.8	1	19	46.449	2.9978	− 8	37	17.93	18.629
δ Cassiopeiæ	2.8	1	20	14.640	3.9006	+59	47	38.69	18.793
γ Phœnicis	3.4	1	24	40.499	2.6076	−43	45	13.17	18.468
38 Cassiopeiæ	6.0	1	24	52.980	+ 4.4156	+69	49	39.72	+18.614
η Piscium	3.7	1	26	55.924	3.2059	+14	54	28.83	18.618
α Ursæ Min. (*Polaris*) †	2.1	1	29	15.60*	+28.5356	+88	51	6.49	+18.547

13 Ceti, dup. 5^{m}.5, 6^{m}.2, 0″.3
α Cassiop., var. irreg. 2^{m}.2, 2^{m}.8
η Cassiop. comp. 7^{m}.6, 4″ s. pr.

β Phœnicis, dup. 4^{m}.1, 4^{m}.1, 1″.
ζ Piscium, star 6^{m}.5, 24″ n. f.

κ Tucanæ, comp. 7^{m}, 6″ n.
α Ursæ Min., star 9^{m}, 18″ s. pr.

WASHINGTON, JANUARY $0^{d}.732$

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation
		h m s	s	° ′ ″	″
40 Cassiopeiæ	5.5	1 31 41.838	+4.7333	+72 36 26.78	+18.46
υ Andromedæ	4.2	1 31 48.127	3.5100	+40 58 50.71	18.08
π Piscium	5.6	1 32 35.397	3.1766	+11 42 25.42	18.46
υ Persei	3.8	1 32 46.020	3.6676	+48 11 52.66	18.30
α Eridani (*Achernar*)	0.6	1 34 32.979	2.2364	−57 40 6.31	18.32
ω Cassiopeiæ	5.5	1 36 1.604	+4.4015	+67 36 49.20	+18.31
ν Piscium	4.7	1 37 0.378	3.1197	+ 5 3 28.40	18.28
φ Persei	4.2	1 38 19.473	3.7444	+50 15 39.68	18.21
τ Ceti	3.6	1 40 7.122	2.7866	−16 23 4.87	19.0
ο Piscium	4.5	1 40 54.186	3.1650	+ 8 43 49.10	18.17
ε Sculptoris †	5.4	1 41 39.682	+2.8046	−25 28 36.93	+18.05
4 Octántis (G.)	5.6	1 42 9.88*	−3.7794	−85 11 57.70	18.11
ζ Ceti	3.9	1 47 15.863	+2.9601	−10 45 16.15	17.86
α Trianguli	3.6	1 48 13.918	3.4134	+29 9 54.88	17.60
ε Cassiopeiæ	3.4	1 48 15.916	4.2844	+63 15 7.54	17.83
ξ Piscium	4.8	1 49 9.215	+3.1038	+ 2 46 6.08	+17.83
β Arietis	2.7	1 49 56.440	3.3083	+20 23 34.70	17.67
ψ Phœnicis	4.4	1 50 14.194	2.4036	−46 43 8.20	17.66
υ Ceti	4.2	1 55 59.966	2.8257	−21 29 21.17	17.52
α Hydri	3.0	1 56 5.081	1.8818	−61 58 59.49	17.55
50 Cassiopeiæ	4.1	1 56 8.901	+5.0610	+72 0 38.42	+17.54
γ Andromedæ *pr.*	2.3	1 58 40.520	3.6712	+41 55 20.73	17.36
γ Anrdomedæ *seq.*	5.1	$\Delta\alpha$ + 0.890	. . . .	$\Delta\delta$ + 4.66	. . . .
α Arietis	2.2	2 2 22.676	3.3761	+23 3 39.78	17.11
β Trianguli	3.1	2 4 28.842	3.5615	+34 35 8.76	17.11
55 Cassiopeiæ	6.2	2 7 47.612	+4.6684	+66 7 36.26	+17.007
6 Persei	5.4	2 7 56.608	3.9734	+50 40 17.60	16.835
ξ^1 Ceti	4.5	2 8 29.556	3.1769	+ 8 26 54.17	16.961
μ Fornacis	5.2	2 9 9.631	2.6378	−31 7 20.88	16.923
γ Trianguli	4.1	2 12 15.373	3.5584	+33 27 16.74	16.747
67 Ceti	5.7	2 12 44.552	+2.9906	− 6 48 48.36	+16.666
φ Eridani	3.8	2 13 28.273	2.1412	−51 54 19.30	16.712
ο Ceti (*Mira*) †	*var.*	2 15 3.092	3.0291	− 3 21 46.70	16.436
κ Fornacis	5.4	2 18 39.156	2.7448	−24 12 8.11	16.411
δ Hydri	4.3	2 20 13.900	1.0584	−69 2 45.34	16.428
ι Cassiopeiæ †	4.6	2 22 2.701	+4.9029	+67 1 15.85	+16.327
ξ^2 Ceti	4.3	2 23 38.244	3.1864	+ 8 4 46.74	16.229
σ Ceti	4.8	2 28 3.433	2.8415	−15 37 1.26	15.904
36 H. Cassiopeiæ	5.3	2 29 55.347	5.6383	+72 26 50.86	15.925
ν Ceti	5.0	2 31 24.676	+3.1451	+ 5 13 22.74	15.809
μ Hydri	5.3	2 33 26.416	−1.3511	−79 28 49.47	+15.680
ν Arietis	5.4	2 33 59.203	+3.4020	+21 35 39.96	15.667
δ Ceti	4.0	2 35 7.461	3.0731	− 0 2 15.01	15.631
ε Hydri	4.3	2 38 16.634	0.9138	−68 37 51.66	15.458
θ Persei	4.2	2 38 23.193	4.0833	+48 52 11.05	15.359
γ Ceti *seq.* †	3.7	2 38 53.664	+3.1059	+ 2 52 41.43	+15.267
π Ceti	4.4	2 40 4.561	2.8537	−14 13 5.18	15.340
μ Ceti	4.4	2 40 20.674	+3.2394	+ 9 45 21.47	+15.311

ε Sculptoris, comp. 9^{m}, 5″ n. f.
ο Ceti, var., 331^{d}, $1^{m}.7$–$9^{m}.6$, star 9^{m} f. 8^{s}

ι Cassiop., triple, 7^{m}, 8^{m}, 2″, 8″

γ Ceti, comp. $6^{m}.2$, 2″.7 pr.

WASHINGTON, JANUARY $0^{d}.732$.

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
Persei . . . †	3.9	2	44	29.228	+4.3576	+55	32	36.93	+15.089
Arietis . . .	3.7	2	44	58.582	3.5248	+26	54	39.24	14.961
Fornacis . . .	4.5	2	45	31.992	2.5121	−32	45	44.94	15.196
Arietis . . .	5.5	2	46	47.812	3.3080	+14	43	56.45	14.933
Eridani . . .	4.8	2	47	10.893	2.7200	−21	21	13.46	14.928
Persei . . .	4.1	2	48	13.337	+4.2364	+52	24	55.69	+14.880
Eridani . . .	4.0	2	52	16.469	2.9302	− 9	14	8.95	14.430
Arietis (*mean*) . . †	4.6	2	54	20.884	3.4254	+21	0	3.66	14.510
H. Cephei . . .	5.7	2	54	43.904	7.8484	+79	5	3.53	14.506
Eridani . . . †	3.4	2	55	2.411	2.2767	−40	38	41.34	14.502
Ceti . . .	2.8	2	57	50.056	+3.1332	+ 3	45	24.85	+14.230
Persei . . .	3.1	2	58	37.879	4.3280	+53	10	28.24	14.254
Eridani . . .	4.2	2	58	38.655	2.6449	−23	57	25.18	14.214
Persei . . . †	*var.*	2	59	43.446	3.8353	+38	30	41.80	14.076
Horologii . . .	5.2	3	1	36.362	1.4077	−60	4	0.91	14.021
Hydri . . .	5.5	3	2	4.123	+0.1002	−72	14	3.81	+14.060
Persei . (*Algol*) †	*var.*	3	2	37.936	3.8934	+40	37	44.41	14.009
Arietis . . .	4.5	3	6	45.936	3.4261	+19	24	21.70	13.751
Eridani . . . †	4.0	3	8	27.562	2.5467	−29	19	18.00	14.278
H. Cephei . . .	5.5	3	9	29.353	7.5006	+77	25	26.39	13.520
Arietis . . .	5.0	3	10	0.743	+3.4436	+20	43	48.35	+13.460
Horologii (G.) . . †	5.7	3	10	23.763	1.5148	−57	38	22.62	13.511
Eridani . . .	4.9	3	11	42.203	2.9124	− 9	8	5.10	13.486
τ Arietis . . .	5.2	3	16	19.010	3.4593	+20	50	28.80	13.097
e Eridani . . .	4.3	3	16	31.960	+2.3980	−43	23	39.34	13.873
ι Hydri . . .	5.5	3	18	3.138	−1.5535	−77	41	57.79	+13.055
α Persei . . .	1.9	3	18	14.796	+4.2690	+49	33	34.51	12.974
o Tauri . . .	3.8	3	20	14.212	3.2254	+ 8	43	49.74	12.795
2 H. Camelopardalis .	4.4	3	22	10.563	4.8372	+59	38	42.66	12.740
ξ Tauri . . .	3.8	3	22	33.631	3.2484	+ 9	26	12.97	12.666
f Tauri . . .	4.3	3	26	10.686	+3.3090	+12	38	46.18	+12.469
ε Eridani . . . †	3.8	3	28	55.491	2.8252	− 9	44	42.81	12.304
τ^{5} Eridani . . .	4.3	3	30	1.905	2.6483	−21	55	2.76	12.162
δ Persei . . .	3.1	3	36	51.984	4.2599	+47	31	0.31	11.685
δ Eridani . . .	3.7	3	39	10.548	2.8730	−10	3	2.13	12.287
ν Persei . . .	3.9	3	39	24.843	+4.0669	+42	18	39.87	+11.540
5 H. Camelopardalis .	4.7	3	41	21.890	6.2840	+71	4	17.87	11.343
η Tauri . (*Alcyone*) †	3.0	3	42	25.719	3.5616	+23	50	35.18	11.273
τ^{6} Eridani . . .	4.3	3	43	11.433	2.5806	−23	29	58.26	10.786
g Eridani . . .	4.2	3	46	16.434	+2.2451	−36	27	24.91	11.016
γ Hydri . . .	3.2	3	48	32.442	−0.9652	−74	29	58.93	+10.995
ζ Persei . . .	2.9	3	48	47.105	+3.7656	+31	37	55.55	10.846
9 H. Camelopardalis . †	5.2	3	49	52.744	5.0940	+60	51	39.62	10.762
ε Persei . . . †	3.0	3	52	8.747	4.0192	+39	45	55.06	10.585
ξ Persei . . .	4.0	3	53	26.756	3.8868	+35	32	50.68	10.498
γ Eridani . . .	3.2	3	54	3.793	+2.7984	−13	44	58.63	+10.359
λ Tauri . . . †	*var.*	3	55	58.159	3.3215	+12	15	3.56	10.315
δ Reticuli . . .	4.4	3	57	23.686	+0.9409	−61	38	22.80	+10.217

Persei, star $8^{m}.5$, 28″ n. pr.
Arietis, dup., $5^{m}.2$, $5^{m}.6$, 1″.2
Eridani, comp. $4^{m}.4$, f. 8″
Persei, var. irreg., $3^{m}.4$–$4^{m}.2$

β Persei, var. $2^{d}.87$, $2^{m}.1$–$3^{m}.2$
12 Eridani, comp. 7^{m}, 1″.4 n. pr.
38 Horologii, remarkable purplish red star.
ε Eridani, comp. 9^{m}, s. 7″

η Tauri, quad., comps. $6^{m}.3$, $7^{m}.6$, $8^{m}.2$, 117″, 181″, 190″
9 H. Camelop., comp. 8^{m}, 1″.9 n. f.
ε Persei, comp. 8^{m}, 8″.6 n. f.
λ Tauri, var., $3^{d}.95$, $3^{m}.3$–$4^{m}.2$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		τ	f	f′	G		H		Log g.	Log h.	i	Lo
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Oct.	1	0.7496	+3.012	+0.006	340 37.7	22 42.5	81 22.1	5 25.5	1.31935	1.27446	+8.07	+0.9
	2	0.7523	3.019	0.009	340 37.5	22 42.5	80 18.0	5 21.2	1.32067	1.27465	8.05	0.9
	3	0.7550	3.025	0.010	340 35.5	22 42.4	79 13.9	5 16.9	1.32184	1.27488	8.03	0.9
	4	0.7578	3.032	0.008	340 32.8	22 42.2	78 9.8	5 12.7	1.32269	1.27514	8.00	0.9
h	5	0.7605	3.039	+0.004	340 30.5	22 42.0	77 5.7	5 8.4	1.32320	1.27540	7.97	0.9
(1.0)	6	0.7632	+3.045	−0.001	340 30.1	22 42.0	76 1.7	5 4.1	1.32339	1.27569	+7.94	+0.8
	7	0.7660	3.052	0.007	340 32.9	22 42.2	74 57.8	4 59.9	1.32335	1.27601	7.91	0.8
	8	0.7687	3.059	0.012	340 39.6	22 42.6	73 53.9	4 55.6	1.32328	1.27634	7.88	0.8
	9	0.7714	3.066	0.015	340 49.9	22 43.3	72 50.1	4 51.3	1.32336	1.27669	7.84	0.8
	10	0.7742	3.072	0.015	341 2.7	22 44.2	71 46.4	4 47.1	1.32380	1.27706	7.80	0.8
	11	0.7769	+3.079	−0.011	341 16.2	22 45.1	70 42.7	4 42.8	1.32474	1.27746	+7.76	+0.8
	12	0.7797	3.086	−0.005	341 28.2	22 45.9	69 39.1	4 38.6	1.32614	1.27788	7.71	0.8
	13	0.7824	3.093	+0.003	341 37.2	22 46.5	68 35.6	4 34.4	1.32788	1.27831	7.67	0.8
	14	0.7851	3.100	0.011	341 42.0	22 46.8	67 32.3	4 30.2	1.32970	1.27876	7.62	0.8
	15	0.7879	3.107	0.016	341 43.1	22 46.9	66 29.0	4 25.9	1.33142	1.27923	7.57	0.87
	16	0.7906	+3.115	+0.018	341 41.4	22 46.8	65 25.8	4 21.7	1.33277	1.27971	+7.51	+0.87
	17	0.7934	3.122	0.017	341 38.8	22 46.6	64 22.7	4 17.5	1.33369	1.28021	7.46	0.87
	18	0.7961	3.129	0.012	341 37.2	22 46.5	63 19.8	4 13.3	1.33413	1.28072	7.40	0.86
	19	0.7988	3.137	+0.006	341 38.2	22 46.5	62 17.0	4 9.1	1.33426	1.28125	7.34	0.86
h	20	0.8016	3.144	−0.001	341 42.4	22 46.8	61 14.2	4 4.9	1.33418	1.28180	7.28	0.86
(2.0)	21	0.8043	+3.152	−0.007	341 50.0	22 47.3	60 11.6	4 0.8	1.33412	1.28235	+7.21	+0.8
	22	0.8070	3.159	0.010	342 0.2	22 48.0	59 9.1	3 56.6	1.33422	1.28292	7.14	0.8
	23	0.8098	3.167	0.012	342 12.1	22 48.8	58 6.8	3 52.5	1.33462	1.28350	7.08	0.8
	24	0.8125	3.175	0.011	342 24.3	22 49.6	57 4.7	3 48.3	1.33533	1.28409	7.00	0.8
	25	0.8153	3.182	0.008	342 35.4	22 50.4	56 2.6	3 44.2	1.33635	1.28469	6.93	0.8
	26	0.8180	+3.190	−0.004	342 45.3	22 51.0	55 0.7	3 40.0	1.33760	1.28530	+6.86	+0.8
	27	0.8207	3.198	+0.001	342 52.6	22 51.5	53 58.9	3 35.9	1.33901	1.28591	6.78	0.8
	28	0.8235	3.207	0.005	342 57.6	22 51.8	52 57.2	3 31.8	1.34050	1.28654	6.70	0.8
	29	0.8262	3.215	0.008	343 0.1	22 52.0	51 55.7	3 27.7	1.34192	1.28717	6.62	0.8
	30	0.8290	3.223	0.009	343 0.6	22 52.0	50 54.4	3 23.6	1.34318	1.28780	6.53	0.81
	31	0.8317	+3.232	+0.008	343 0.3	22 52.0	49 53.2	3 19.5	1.34419	1.28844	+6.45	+0.80
Nov.	1	0.8344	3.240	+0.005	342 59.9	22 52.0	48 52.1	3 15.5	1.34490	1.28909	6.36	0.80
	2	0.8372	3.249	0.000	343 1.0	22 52.1	47 51.2	3 11.4	1.34532	1.28974	6.27	0.79
	3	0.8399	3.257	−0.006	343 4.8	22 52.3	46 50.4	3 7.4	1.34552	1.29040	6.18	0.79
	4	0.8426	3.266	0.012	343 12.2	22 52.8	45 49.8	3 3.3	1.34565	1.29105	6.08	0.78
h	5	0.8454	+3.275	−0.016	343 23.0	22 53.4	44 49.2	2 59.3	1.34593	1.29171	+5.98	+0.77
(3.0)	6	0.8481	3.284	0.016	343 36.4	22 54.4	43 48.9	2 55.3	1.34651	1.29237	5.89	0.77
	7	0.8508	3.293	0.014	343 50.9	22 55.4	42 48.8	2 51.3	1.34757	1.29303	5.79	0.76
	8	0.8536	3.302	−0.008	344 4.4	22 56.3	41 48.7	2 47.3	1.34907	1.29368	5.69	0.75
	9	0.8563	3.311	0.000	344 15.4	22 57.0	40 48.8	2 43.3	1.35095	1.29433	5.58	0.74
	10	0.8591	+3.321	+0.008	344 22.4	22 57.4	39 49.1	2 39.3	1.35299	1.29498	+5.48	+0.73
	11	0.8618	3.330	0.015	344 25.7	22 57.7	38 49.6	2 35.3	1.35492	1.29563	5.37	0.73
	12	0.8645	3.340	0.019	344 25.7	22 57.7	37 50.2	2 31.3	1.35659	1.29626	5.26	0.72
	13	0.8673	3.349	0.018	344 24.6	22 57.6	36 50.9	2 27.4	1.35790	1.29690	5.15	0.71
	14	0.8700	3.359	0.015	344 23.8	22 57.4	35 51.8	2 23.5	1.35874	1.29753	5.04	0.70
	15	0.8728	+3.369	+0.009	344 24.9	22 57.5	34 52.9	2 19.5	1.35918	1.29816	+4.93	+0.69
	16	0.8755	+3.379	+0.002	344 29.1	22 57.9	33 54.1	2 15.6	1.35944	1.29877	+4.81	+0.68

FOR WASHINGTON MEAN MIDNIGHT.

Day. ereal ur.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
. 16	0.8755	+3.379	+0.002	344 29.1	22 57.9	33 54.1	2 15.6	1.35944	1.29877	+4.81	+0.6825
17	0.8782	3.389	−0.004	344 36.4	22 58.4	32 55.4	2 11.7	1.35967	1.29937	4.70	0.6718
18	0.8810	3.399	0.009	344 46.5	22 59.1	31 56.8	2 7.8	1.36002	1.29996	4.58	0.6608
19	0.8837	3.409	0.011	344 58.1	22 59.9	30 58.4	2 3.9	1.36065	1.30055	4.46	0.6493
20	0.8864	3.420	0.011	345 10.3	23 0.7	30 0.2	2 0.0	1.36160	1.30113	4.34	0.6374
) 21	0.8892	+3.430	−0.008	345 21.7	23 1.4	29 2.1	1 56.1	1.36285	1.30170	+4.22	+0.6250
22	0.8919	3.440	−0.005	345 31.4	23 2.1	28 4.1	1 52.3	1.36431	1.30226	4.09	0.6121
23	0.8947	3.451	0.000	345 39.1	23 2.6	27 6.2	1 48.4	1.36596	1.30280	3.97	0.5986
24	0.8974	3.462	+0.004	345 44.2	23 2.9	26 8.4	1 44.6	1.36766	1.30333	3.84	0.5846
25	0.9002	3.472	0.008	345 47.1	23 3.1	25 10.8	1 40.7	1.36935	1.30384	3.72	0.5700
26	0.9029	+3.483	+0.009	345 47.9	23 3.2	24 13.2	1 36.9	1.37088	1.30434	+3.59	+0.5547
27	0.9056	3.494	0.009	345 47.5	23 3.2	23 15.8	1 33.1	1.37219	1.30484	3.46	0.5387
28	0.9084	3.505	0.006	345 46.9	23 3.1	22 18.5	1 29.2	1.37323	1.30531	3.33	0.5219
29	0.9111	3.516	+0.001	345 47.2	23 3.1	21 21.3	1 25.4	1.37399	1.30577	3.19	0.5043
30	0.9138	3.527	−0.005	345 49.6	23 3.3	20 24.1	1 21.6	1.37452	1.30620	3.06	0.4858
c. 1	0.9166	+3.538	−0.011	345 55.0	23 3.7	19 27.1	1 17.8	1.37497	1.30663	+2.93	+0.4664
2	0.9193	3.550	0.016	346 3.6	23 4.2	18 30.2	1 14.0	1.37551	1.30704	2.79	0.4458
3	0.9220	3.561	0.018	346 14.9	23 5.0	17 33.3	1 10.2	1.37631	1.30743	2.66	0.4242
4	0.9248	3.572	0.016	346 27.4	23 5.8	16 36.5	1 6.4	1.37751	1.30781	2.52	0.4012
5	0.9275	3.584	0.011	346 39.4	23 6.6	15 39.8	1 2.7	1.37916	1.30816	2.38	0.3768
0) 6	0.9302	+3.595	−0.004	346 49.2	23 7.3	14 43.2	0 58.9	1.38117	1.30850	+2.24	+0.3507
7	0.9330	3.607	+0.005	346 55.7	23 7.7	13 46.6	0 55.1	1.38342	1.30882	2.10	0.3229
8	0.9357	3.618	0.013	346 58.3	23 7.9	12 50.1	0 51.3	1.38563	1.30911	1.96	0.2930
9	0.9385	3.630	0.018	346 57.8	23 7.9	11 53.7	0 47.6	1.38762	1.30938	1.82	0.2608
10	0.9412	3.642	0.019	346 55.5	23 7.7	10 57.3	0 43.8	1.38923	1.30965	1.68	0.2257
11	0.9439	+3.654	+0.017	346 53.0	23 7.5	10 0.9	0 40.1	1.39043	1.30989	+1.54	+0.1875
12	0.9467	3.665	0.012	346 52.1	23 7.5	9 4.7	0 36.3	1.39126	1.31010	1.40	0.1454
13	0.9494	3.677	+0.005	346 53.6	23 7.6	8 8.5	0 32.6	1.39182	1.31030	1.26	0.0987
14	0.9522	3.689	−0.002	346 58.2	23 7.9	7 12.3	0 28.8	1.39231	1.31047	1.11	0.0461
15	0.9549	3.701	0.007	347 5.3	23 8.4	6 16.1	0 25.1	1.39289	1.31063	0.97	9.9861
16	0.9576	+3.713	−0.010	347 14.2	23 8.9	5 20.0	0 21.3	1.39369	1.31076	+0.83	+9.9163
17	0.9604	3.725	0.010	347 23.6	23 9.6	4 23.9	0 17.6	1.39476	1.31088	0.68	9.8329
18	0.9631	3.736	0.009	347 32.4	23 10.2	3 27.8	0 13.9	1.39610	1.31098	0.54	9.7294
19	0.9658	3.748	0.005	347 39.9	23 10.7	2 31.8	0 10.1	1.39771	1.31104	0.39	9.5931
h 20	0.9686	3.760	−0.001	347 45.3	23 11.0	1 35.8	0 6.4	1.39942	1.31109	0.25	9.3931
3.0) 21	0.9713	+3.772	+0.004	347 48.7	23 11.2	0 39.7	0 2.6	1.40121	1.31111	+0.10	+9.0107
22	0.9741	3.784	0.007	347 49.4	23 11.3	359 43.6	23 58.9	1.40300	1.31111	−0.04	−8.6260
23	0.9768	3.796	0.010	347 48.3	23 11.2	358 47.6	23 55.2	1.40463	1.31110	0.19	9.2719
24	0.9795	3.808	0.010	347 45.9	23 11.1	357 51.5	23 51.4	1.40610	1.31107	0.33	9.5208
25	0.9823	3.820	0.008	347 43.1	23 10.9	356 55.4	23 47.7	1.40730	1.31100	0.48	9.6780
26	0.9850	+3.832	+0.003	347 40.8	23 10.7	355 59.3	23 44.0	1.40824	1.31092	−0.62	−9.7931
27	0.9878	3.844	−0.003	347 40.0	23 10.7	355 3.1	23 40.2	1.40891	1.31081	0.76	9.8838
28	0.9905	3.856	0.009	347 41.8	23 10.8	354 6.9	23 36.5	1.40948	1.31069	0.91	9.9588
29	0.9932	3.868	0.015	347 46.4	23 11.1	353 10.7	23 32.7	1.41007	1.31055	1.05	0.0226
30	0.9960	3.880	0.018	347 53.6	23 11.6	352 14.4	23 29.0	1.41084	1.31038	1.20	0.0780
31	0.9987	+3.892	−0.018	348 2.3	23 12.2	351 18.1	23 25.2	1.41194	1.31019	−1.34	−0.1271
32	1.0014	+3.903	−0.014	348 11.0	23 12.7	350 21.7	23 21.4	1.41344	1.30998	−1.48	−0.1711

FOR WASHINGTON SIDEREAL TWELVE HOURS.

Mean Solar Date.	Log A_1.	Log B_1.	Log C.	Log D.	f	G_1	H	Log g_1.	Log h.	Log
					s	° ′	° ′			
Jan. 0.72	+9.2573	−0.8651	−0.5110	+1.3045	+0.557	296 19	350 52	0.9126	1.3101	−0.14
10.70	9.3405	0.8683	0.8100	1.2838	0.674	300 44	341 26	0.9340	1.3070	0.44
20.67	9.4068	0.8745	0.9761	1.2475	0.786	304 20	331 50	0.9576	1.3022	0.61
30.64	9.4602	0.8826	1.0853	1.1928	0.888	307 10	322 1	0.9811	1.2962	0.72
Feb. 9.61	9.5034	0.8910	1.1611	1.1145	0.981	309 23	311 56	1.0029	1.2896	0.79
19.59	+9.5389	−0.8985	−1.2137	+1.0023	+1.065	311 13	301 34	1.0221	1.2833	−0.85
Mar. 1.56	9.5685	0.9040	1.2483	0.8323	1.139	312 48	290 59	1.0384	1.2781	0.88
11.53	9.5940	0.9066	1.2678	+0.5247	1.208	314 18	280 14	1.0519	1.2748	0.90
21.50	9.6171	0.9057	1.2736	−9.2669	1.274	315 53	269 26	1.0630	1.2737	0.91
31.48	9.6390	0.9012	1.2665	0.5670	1.340	317 37	258 42	1.0725	1.2750	0.90
Apr. 10.45	+9.6608	−0.8934	−1.2461	−0.8492	+1.409	319 33	248 9	1.0814	1.2785	−0.88
20.42	9.6832	0.8827	1.2114	1.0095	1.484	321 42	237 52	1.0905	1.2836	0.84
30.40	9.7066	0.8700	1.1601	1.1161	1.565	323 59	227 54	1.1006	1.2897	0.79
May 10.37	9.7310	0.8562	1.0879	1.1909	1.655	326 21	218 16	1.1126	1.2960	0.72
20.34	9.7561	0.8425	0.9864	1.2439	1.753	328 40	208 56	1.1266	1.3018	0.62
30.31	+9.7815	−0.8302	−0.8377	−1.2798	+1.859	330 50	199 52	1.1424	1.3065	−0.47
June 9.28	9.8068	0.8204	0.5898	1.3016	1.971	332 46	190 59	1.1598	1.3096	0.227
19.26	9.8312	0.8139	−9.9005	1.3107	2.085	334 23	182 14	1.1782	1.3110	−9.537
29.23	9.8546	0.8112	+0.3647	1.3078	2.200	335 42	173 30	1.1969	1.3106	+0.00
July 9.20	9.8763	0.8123	0.7293	1.2926	2.313	336 42	164 43	1.2152	1.3083	0.36
19.18	+9.8962	−0.8166	+0.9171	−1.2644	+2.422	337 27	155 48	1.2327	1.3044	+0.55
29.15	9.9141	0.8232	1.0389	1.2211	2.524	337 58	146 41	1.2490	1.2991	0.67
Aug. 8.12	9.9300	0.8310	1.1245	1.1592	2.618	338 20	137 17	1.2638	1.2931	0.761
18.09	9.9441	0.8387	1.1857	1.0723	2.703	338 37	127 36	1.2771	1.2869	0.82
28.07	9.9564	0.8451	1.2287	0.9473	2.781	338 53	117 37	1.2886	1.2812	0.86
Sept. 7.04	+9.9674	−0.8491	+1.2566	−0.7508	+2.852	339 12	107 20	1.2987	1.2768	+0.89
17.01	9.9774	0.8500	1.2711	−0.3491	2.919	339 36	96 49	1.3076	1.2742	0.90
26.98	9.9869	0.8471	1.2729	+0.0958	2.983	340 7	86 12	1.3156	1.2738	0.910
Oct. 6.96	9.9963	0.8402	1.2618	0.6732	3.048	340 48	75 32	1.3232	1.2758	0.89
16.93	0.0061	0.8294	1.2371	0.9061	3.118	341 38	64 59	1.3308	1.2799	0.874
26.90	+0.0166	−0.8151	+1.1967	+1.0484	+3.194	342 35	54 36	1.3390	1.2855	+0.834
Nov. 5.88	0.0279	0.7985	1.1371	1.1456	3.278	343 36	44 26	1.3479	1.2920	0.774
15.85	0.0402	0.7806	1.0519	1.2142	3.372	344 39	34 32	1.3580	1.2984	0.68
25.82	0.0533	0.7633	0.9278	1.2617	3.476	345 39	24 52	1.3691	1.3040	0.565
Dec. 5.79	0.0670	0.7482	0.7320	1.2924	3.587	346 32	15 23	1.3811	1.3083	0.369
15.77	+0.0809	−0.7371	+0.3314	+1.3083	+3.704	347 16	6 1	1.3937	1.3107	+0.96
25.74	0.0947	0.7311	−0.0711	1.3102	3.823	347 49	356 42	1.4065	1.3110	−9.70
35.71	+0.1079	−0.7306	−0.6501	+1.2985	+3.941	348 11	347 20	1.4192	1.3092	−0.28

$E = +0^{s}.002.$

The above numbers give the same reductions from mean to apparent place as are employed in computing the apparent places of the fixed stars, given on pages 287 to 486, from the mean places, given on pages 233 to 250. In order to render exact interpolation possible through intervals of ten days, all short period terms have been omitted.

FOR WASHINGTON MEAN MIDNIGHT.

ate.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω
	″	″		″	″		″	″		″	″
0	+0.02	−0.10	Feb. 15	+0.11	+0.10	Apr. 1	−0.24	+0.02	May 17	+0.05	−0.08
1	0.10	0.07	16	0.00	0.10	2	0.21	−0.04	18	0.12	0.06
2	0.16	−0.04	17	−0.10	0.08	3	0.13	0.08	19	0.15	−0.02
3	0.18	+0.01	18	0.17	0.05	4	−0.02	0.11	20	0.14	+0.03
4	0.15	0.06	19	0.21	+0.01	5	+0.11	0.11	21	+0.09	0.07
5	+0.07	0.09	20	0.21	−0.03	6	0.22	0.08	22	0.00	0.10
6	−0.03	0.11	21	0.18	0.07	7	0.29	−0.04	23	−0.10	0.10
7	0.14	0.10	22	0.12	0.09	8	0.31	+0.01	24	0.20	0.09
8	0.23	0.07	23	−0.04	0.10	9	0.26	0.06	25	0.26	+0.05
9	0.27	+0.02	24	+0.05	0.09	10	0.18	0.09	26	0.27	0.00
10	−0.24	−0.04	25	+0.12	−0.06	11	+0.07	+0.10	27	−0.22	−0.05
11	0.17	0.08	26	0.17	−0.02	12	−0.04	0.09	28	0.12	0.09
12	−0.05	0.11	27	0.17	+0.03	13	0.13	0.07	29	−0.01	0.11
13	+0.09	0.11	28	0.13	0.07	14	0.19	+0.03	30	+0.15	0.10
14	0.20	0.08	Mar. 1	+0.05	0.10	15	0.24	−0.01	31	0.26	0.07
15	0.28	−0.04	2	−0.05	0.11	16	0.20	0.05	June 1	0.31	−0.02
16	0.30	+0.01	3	0.15	0.09	17	0.15	0.08	2	0.31	+0.03
17	0.26	0.06	4	0.22	+0.05	18	0.09	0.10	3	0.26	0.07
18	0.19	0.09	5	0.24	0.00	19	−0.01	0.10	4	0.16	0.10
19	+0.08	0.10	6	0.20	−0.05	20	+0.07	0.08	5	+0.05	0.10
20	−0.02	+0.10	7	−0.11	−0.09	21	+0.12	−0.05	6	−0.05	+0.09
21	0.12	0.07	8	+0.02	0.11	22	0.15	0.00	7	0.13	0.06
22	0.18	+0.04	9	0.14	0.10	23	0.13	+0.04	8	0.18	+0.01
23	0.21	0.00	10	0.24	0.07	24	+0.07	0.08	9	0.19	−0.03
24	0.20	−0.04	11	0.29	−0.02	25	−0.02	0.10	10	0.16	0.06
25	0.16	0.08	12	0.29	+0.03	26	0.12	0.10	11	0.11	0.09
26	0.09	0.10	13	0.23	0.07	27	0.21	0.08	12	−0.03	0.10
27	−0.01	0.10	14	0.14	0.10	28	0.25	+0.03	13	+0.04	0.09
28	+0.08	0.08	15	+0.03	0.10	29	0.24	−0.02	14	0.11	0.07
29	0.15	−0.05	16	−0.07	0.09	30	0.18	0.07	15	0.15	−0.03
30	+0.18	0.00	17	−0.15	+0.06	May 1	−0.06	−0.10	16	+0.16	+0.02
31	0.17	+0.04	18	0.20	+0.02	2	+0.07	0.11	17	0.12	0.06
eb. 1	0.11	0.08	19	0.21	−0.02	3	0.20	0.09	18	+0.04	0.09
2	+0.02	0.10	20	0.19	0.06	4	0.29	−0.05	19	−0.06	0.10
3	−0.09	0.10	21	0.14	0.09	5	0.32	0.00	20	0.17	0.09
4	0.19	0.08	22	−0.07	0.10	6	0.30	+0.05	21	0.25	0.06
5	0.25	+0.03	23	+0.02	0.09	7	0.22	0.08	22	0.29	+0.01
6	0.25	−0.02	24	0.09	0.07	8	0.12	0.10	23	0.26	−0.04
7	0.19	0.07	25	0.14	−0.03	9	+0.01	0.10	24	0.18	0.08
8	−0.08	0.10	26	0.16	+0.01	10	−0.09	0.08	25	−0.06	0.11
9	+0.05	−0.11	27	+0.13	+0.06	11	−0.16	+0.04	26	+0.08	−0.10
10	0.17	0.09	28	+0.06	0.09	12	0.20	0.00	27	0.20	0.08
11	0.25	0.05	29	−0.03	0.11	13	0.20	−0.04	28	0.29	−0.04
12	0.29	−0.01	30	0.13	0.10	14	0.16	0.07	29	0.31	+0.02
13	0.27	+0.04	31	0.21	0.06	15	0.10	0.09	30	0.27	0.06
14	0.20	0.08	Apr. 1	0.24	+0.02	16	−0.02	0.10	July 1	0.19	0.09
15	+0.11	+0.10	2	−0.21	−0.04	17	+0.05	−0.08	2	+0.09	+0.10

FOR WASHINGTON MEAN MIDNIGHT.

Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″
	″	″		″	″		″	″		″	
July 1	+0.19	+0.09	Aug. 16	−0.27	0.00	Oct. 1	+0.10	−0.07	Nov. 16	+0.03	+0.
2	+0.09	0.10	17	0.23	−0.05	2	0.14	−0.04	17	−0.07	0.
3	−0.02	0.09	18	0.14	0.09	3	0.16	+0.01	18	0.14	0.
4	0.11	0.07	19	−0.02	0.11	4	0.13	0.05	19	0.18	+0.
5	0.16	+0.03	20	+0.11	0.10	5	+0.07	0.08	20	0.17	−0.
6	0.18	−0.01	21	0.22	0.07	6	−0.02	0.10	21	0.14	0.
7	0.16	0.05	22	0.27	−0.02	7	0.12	0.10	22	−0.07	0.
8	0.12	0.08	23	0.27	+0.03	8	0.20	0.07	23	0.00	0.
9	−0.05	0.10	24	0.22	0.08	9	0.25	+0.03	24	+0.07	0.
10	+0.03	0.09	25	0.13	0.10	10	0.25	−0.02	25	0.12	0.
11	+0.10	−0.07	26	+0.03	+0.10	11	−0.19	−0.07	26	+0.15	−0.
12	0.15	−0.04	27	−0.07	0.08	12	−0.08	0.10	27	0.14	+0.
13	0.17	0.00	28	0.14	0.05	13	+0.05	0.11	28	0.10	0.
14	0.15	+0.05	29	0.18	+0.01	14	0.17	0.09	29	+0.02	0.
15	+0.08	0.08	30	0.18	−0.03	15	0.26	−0.05	30	−0.08	0.
16	−0.02	0.10	31	0.15	0.07	16	0.30	0.00	Dec. 1	0.18	0.
17	0.12	0.10	Sept. 1	0.09	0.09	17	0.27	+0.05	2	0.26	0.
18	0.22	0.07	2	−0.02	0.10	18	0.20	0.09	3	0.29	+0.
19	0.28	+0.03	3	+0.06	0.09	19	+0.10	0.10	4	0.26	−0.
20	0.28	−0.02	4	0.12	0.06	20	−0.01	0.10	5	0.18	0.
21	−0.22	−0.07	5	+0.16	−0.02	21	−0.11	+0.07	6	−0.06	−0.
22	−0.11	0.10	6	0.17	+0.02	22	0.17	+0.04	7	+0.08	0.
23	+0.02	0.11	7	0.13	0.06	23	0.19	−0.01	8	0.21	0.
24	0.15	0.09	8	+0.06	0.09	24	0.17	0.05	9	0.29	−0.
25	0.25	−0.05	9	−0.04	0.10	25	0.13	0.08	10	0.31	+0.
26	0.29	0.00	10	0.14	0.09	26	−0.06	0.09	11	0.27	0.
27	0.27	+0.05	11	0.22	0.06	27	+0.01	0.09	12	0.19	0.
28	0.21	0.08	12	0.26	+0.01	28	0.08	0.08	13	+0.08	0.
29	0.11	0.10	13	0.24	−0.04	29	0.13	0.05	14	−0.03	0.
30	+0.01	0.10	14	0.16	0.08	30	0.15	−0.01	15	0.11	0.
31	−0.09	+0.08	15	−0.05	−0.11	31	+0.14	+0.03	16	−0.16	+0.
Aug. 1	0.15	+0.04	16	+0.08	0.10	Nov. 1	+0.08	0.07	17	0.17	−0.
2	0.18	0.00	17	0.19	0.08	2	0.00	0.10	18	0.14	0.
3	0.17	−0.04	18	0.27	−0.03	3	−0.10	0.10	19	0.08	0.
4	0.13	0.07	19	0.28	+0.02	4	0.19	0.08	20	−0.01	0.
5	−0.07	0.09	20	0.24	0.06	5	0.26	+0.05	21	+0.06	0.
6	+0.01	0.09	21	0.16	0.09	6	0.27	0.00	22	0.12	0.
7	0.08	0.08	22	+0.05	0.10	7	0.22	−0.05	23	0.16	−0.
8	0.14	0.05	23	−0.05	0.09	8	−0.12	0.09	24	0.16	+0.
9	0.17	−0.01	24	0.13	0.06	9	+0.01	0.11	25	0.12	0.
10	+0.16	+0.03	25	−0.18	+0.02	10	+0.14	−0.10	26	+0.06	+0.0
11	0.11	0.07	26	0.19	−0.02	11	0.25	0.06	27	−0.04	0.1
12	+0.03	0.10	27	0.16	0.07	12	0.30	−0.02	28	0.15	0.1
13	−0.08	0.10	28	0.11	0.08	13	0.30	+0.03	29	0.24	0.0
14	0.18	0.09	29	−0.04	0.09	14	0.24	0.08	30	0.29	+0.0
15	0.25	+0.05	30	+0.03	0.09	15	0.14	0.10	31	0.29	−0.0
16	−0.27	0.00	Oct. 1	+0.10	−0.07	16	+0.03	+0.10	32	−0.23	−0.0

WASHINGTON, JANUARY $0^{d}.732$.

Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
Piscium	4.7	0	0	59.112	+ 3.0714	− 6	10	59.04	+20.136
Andromedæ (*Alpheratz*)	2.2	0	3	59.450	3.0960	+28	37	16.23	19.880
Cassiopeiæ	2.4	0	4	38.056	3.1851	+58	40	51.55	19.861
Phœnicis	3.9	0	5	5.987	3.0512	−46	12	59.41	19.848
Andromedæ	5.1	0	5	53.898	3.1098	+45	35	57.38	20.034
Pegasi	2.9	0	8	51.420	+ 3.0865	+14	42	39.81	+20.021
Andromedæ	4.5	0	13	52.995	3.1276	+36	18	50.41	19.962
ι Ceti	3.8	0	15	5.845	3.0569	− 9	17	42.12	19.973
Tucanæ	4.3	0	15	39.189	3.1477	−65	22	26.29	21.171
Piscium	6.0	0	21	2.687	3.0744	+ 1	28	8.31	19.938
β Hydri	2.9	0	21	18.226	+ 3.2000	−77	43	58.65	+20.277
α Phœnicis	2.4	0	22	5.172	2.9725	−42	46	3.30	19.550
2 Ceti	6.0	0	25	42.071	3.0622	− 4	25	36.49	19.919
3 Ceti †	5.2	0	30	52.341	3.0871	− 4	3	38.03	19.847
Cassiopeiæ	3.7	0	32	13.732	3.3288	+53	25	45.39	19.841
π Andromedæ	4.4	0	32	20.224	+ 3.1977	+33	15	5.76	+19.847
ε Andromedæ	4.5	0	34	3.624	3.1644	+28	51	1.40	19.571
δ Andromedæ	3.5	0	34	46.744	3.2021	+30	23	45.13	19.718
α Cassiopeiæ (*Schedir*) †	*var.*	0	35	40.497	3.3869	+56	4	16.87	19.771
μ Phœnicis	4.6	0	37	18.605	2.8393	−46	33	6.68	19.749
β Ceti	2.2	0	39	19.419	+ 3.0125	−18	27	10.44	+19.793
o Cassiopeiæ	4.7	0	39	58.953	3.3314	+47	49	9.82	19.735
1 Cassiopeiæ	5.6	0	40	0.695	3.9060	+74	31	25.22	19.715
ζ Andromedæ	4.3	0	42	49.797	3.1748	+23	48	17.90	19.618
η Cassiopeiæ †	3.6	0	43	56.963	3.6136	+57	21	57.15	19.202
δ Piscium	4.6	0	44	16.251	+ 3.1101	+ 7	7	21.73	+19.629
λ Hydri	5.0	0	45	39.057	2.1010	−75	23	8.87	19.649
20 Ceti	4.9	0	48	39.747	3.0642	− 1	36	19.65	19.592
γ Cassiopeiæ	2.2	0	51	34.034	3.5980	+60	15	24.17	19.535
μ Andromedæ	3.9	0	52	1.817	3.3211	+38	2	18.68	19.561
α Sculptoris	4.4	0	54	30.589	+ 2.8904	−29	49	0.63	+19.468
43 H. Cephei	4.5	0	56	54.030	7.6192	+85	48	6.45	19.427
ε Piscium	4.4	0	58	31.808	3.1112	+ 7	25	57.90	19.421
β Phœnicis †	3.4	1	2	17.447	2.6798	−47	10	26.62	19.286
μ Cassiopeiæ	5.3	1	2	36.265	3.9699	+54	30	14.24	17.747
η Ceti	3.6	1	4	18.827	+ 3.0175	−10	37	56.92	+19.136
β Andromedæ	2.4	1	4	58.060	3.3508	+35	10	12.60	19.129
τ Piscium	4.7	1	6	58.496	3.2972	+29	38	19.22	19.167
ζ Piscium †	5.6	1	9	17.333	3.1319	+ 7	7	34.20	19.084
κ Tucanæ †	5.0	1	12	53.231	2.0395	−69	19	39.52	19.129
f Piscium	5.3	1	13	24.803	+ 3.0926	+ 3	10	1.65	+19.000
υ Piscium	4.7	1	14	47.437	3.2908	+26	49	3.41	18.979
θ Ceti	3.8	1	19	46.449	2.9978	− 8	37	17.93	18.629
δ Cassiopeiæ	2.8	1	20	14.640	3.9006	+59	47	38.69	18.793
γ Phœnicis	3.4	1	24	40.499	2.6076	−43	45	13.17	18.468
38 Cassiopeiæ	6.0	1	24	52.980	+ 4.4156	+69	49	39.72	+18.614
η Piscium	3.7	1	26	55.924	3.2059	+14	54	28.83	18.618
α Ursæ Min. (*Polaris*) †	2.1	1	29	15.60*	+28.5356	+88	51	6.49	+18.547

13 Ceti, dup. $5^{m}.5$, $6^{m}.2$, $0''.3$
α Cassiop., var. irreg. $2^{m}.2$, $2^{m}.8$
η Cassiop. comp. $7^{m}.6$, $4''$ s. pr.

β Phœnicis, dup. $4^{m}.1$, $4^{m}.1$, $1''$.
ζ Piscium, star $6^{m}.5$, $24''$ n. f.

κ Tucanæ, comp. 7^{m}, $6''$ n.
α Ursæ Min., star 9^{m}, $18''$ s. pr.

WASHINGTON, JANUARY $0^d.732$.

Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
40 Cassiopeiæ	5.5	1 31 41.838	+4.7333	+72 36 26.78	+18.461
υ Andromedæ	4.2	1 31 48.127	3.5100	+40 58 50.71	18.08
π Piscium	5.6	1 32 35.397	3.1766	+11 42 25.42	18.46
υ Persei	3.8	1 32 46.020	3.6676	+48 11 52.66	18.30
α Eridani (*Achernar*)	0.6	1 34 32.979	2.2364	−57 40 6.31	18.313
ω Cassiopeiæ	5.5	1 36 1.604	+4.4015	+67 36 49.20	+18.31
ν Piscium	4.7	1 37 0.378	3.1197	+ 5 3 28.40	18.28
φ Persei	4.2	1 38 19.473	3.7444	+50 15 39.68	18.21
τ Ceti	3.6	1 40 7.122	2.7866	−16 23 4.87	19.00
ο Piscium	4.5	1 40 54.186	3.1650	+ 8 43 49.10	18.179
ε Sculptoris . †	5.4	1 41 39.682	+2.8046	−25 28 36.93	+18.05
4 Octántis (G.)	5.6	1 42 9.88*	−3.7794	−85 11 57.70	18.11
ζ Ceti	3.9	1 47 15.863	+2.9601	−10 45 16.15	17.863
α Trianguli	3.6	1 48 13.918	3.4134	+29 9 54.88	17.60
ε Cassiopeiæ	3.4	1 48 15.916	4.2844	+63 15 7.54	17.83
ξ Piscium	4.8	1 49 9.215	+3.1038	+ 2 46 6.08	+17.83
β Arietis	2.7	1 49 56.440	3.3083	+20 23 34.70	17.67
ψ Phœnicis	4.4	1 50 14.194	2.4036	−46 43 8.20	17.667
υ Ceti	4.2	1 55 59.966	2.8257	−21 29 21.17	17.52
α Hydri	3.0	1 56 5.081	1.8818	−61 58 59.49	17.555
50 Cassiopeiæ	4.1	1 56 8.901	+5.0610	+72 0 38.42	+17.54
γ Andromedæ *pr.*	2.3	1 58 40.520	3.6712	+41 55 20.73	17.367
γ Anrdomedæ *seq.*	5.1	$\Delta\alpha$ + 0.890	. . . .	$\Delta\delta$ + 4.66	. . . .
α Arietis	2.2	2 2 22.676	3.3761	+23 3 39.78	17.111
β Trianguli	3.1	2 4 28.842	3.5615	+34 35 8.76	17.116
55 Cassiopeiæ	6.2	2 7 47.612	+4.6684	+66 7 36.26	+17.007
6 Persei	5.4	2 7 56.608	3.9734	+50 40 17.60	16.835
ξ^1 Ceti	4.5	2 8 29.556	3.1769	+ 8 26 54.17	16.961
μ Fornacis	5.2	2 9 9.631	2.6378	−31 7 20.88	16.923
γ Trianguli	4.1	2 12 15.373	3.5584	+33 27 16.74	16.747
67 Ceti	5.7	2 12 44.552	+2.9906	− 6 48 48.36	+16.666
φ Eridani	3.8	2 13 28.273	2.1412	−51 54 19.30	16.712
ο Ceti (*Mira*) †	*var.*	2 15 3.092	3.0291	− 3 21 46.70	16.436
κ Fornacis	5.4	2 18 39.156	2.7448	−24 12 8.11	16.411
δ Hydri	4.3	2 20 13.900	1.0584	−69 2 45.34	16.428
ι Cassiopeiæ . †	4.6	2 22 2.701	+4.9029	+67 1 15.85	+16.327
ξ^2 Ceti	4.3	2 23 38.244	3.1864	+ 8 4 46.74	16.229
σ Ceti	4.8	2 28 3.433	2.8415	−15 37 1.26	15.904
36 H. Cassiopeiæ	5.3	2 29 55.347	5.6383	+72 26 50.86	15.925
ν Ceti	5.0	2 31 24.676	+3.1451	+ 5 13 22.74	15.809
μ Hydri	5.3	2 33 26.416	−1.3511	−79 28 49.47	+15.680
ν Arietis	5.4	2 33 59.203	+3.4020	+21 35 39.96	15.667
δ Ceti	4.0	2 35 7.461	3.0731	− 0 2 15.01	15.631
ε Hydri	4.3	2 38 16.634	0.9138	−68 37 51.66	15.458
θ Persei	4.2	2 38 23.193	4.0833	+48 52 11.05	15.359
γ Ceti *seq.* . †	3.7	2 38 53.664	+3.1059	+ 2 52 41.43	+15.267
π Ceti	4.4	2 40 4.561	2.8537	−14 13 5.18	15.340
μ Ceti	4.4	2 40 20.674	+3.2394	+ 9 45 21.47	+15.311

ε Sculptoris, comp. 9^m, 5″ n. f.
ο Ceti, var., 331^d, $1^m.7$–$9^m.6$, star 9^m f. 8^s

ι Cassiop., triple, 7^m, 8^m, 2″, 8″

γ Ceti, comp. $6^m.2$, 2″.7 pr.

WASHINGTON, JANUARY 0d.732.

Name of Star.		Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
			h	m	s	s	°	′	″	″
Persei	†	3.9	2	44	29.228	+4.3576	+55	32	36.93	+15.089
Arietis		3.7	2	44	58.582	3.5248	+26	54	39.24	14.961
Fornacis		4.5	2	45	31.992	2.5121	−32	45	44.94	15.196
Arietis		5.5	2	46	47.812	3.3080	+14	43	56.45	14.933
Eridani		4.8	2	47	10.893	2.7200	−21	21	13.46	14.928
Persei		4.1	2	48	13.337	+4.2364	+52	24	55.69	+14.880
Eridani		4.0	2	52	16.469	2.9302	− 9	14	8.95	14.430
Arietis (*mean*)	†	4.6	2	54	20.884	3.4254	+21	0	3.66	14.510
H. Cephei		5.7	2	54	43.904	7.8484	+79	5	3.53	14.506
Eridani	†	3.4	2	55	2.411	2.2767	−40	38	41.34	14.502
Ceti		2.8	2	57	50.056	+3.1332	+ 3	45	24.85	+14.230
Persei		3.1	2	58	37.879	4.3280	+53	10	28.24	14.254
Eridani		4.2	2	58	38.655	2.6449	−23	57	25.18	14.214
Persei	†	*var.*	2	59	43.446	3.8353	+38	30	41.80	14.076
Horologii		5.2	3	1	36.362	1.4077	−60	4	0.91	14.021
Hydri		5.5	3	2	4.123	+0.1002	−72	14	3.81	+14.060
Persei (*Algol*)	†	*var.*	3	2	37.936	3.8934	+40	37	44.41	14.009
Arietis		4.5	3	6	45.936	3.4261	+19	24	21.70	13.751
Eridani	†	4.0	3	8	27.562	2.5467	−29	19	18.00	14.278
H. Cephei		5.5	3	9	29.353	7.5006	+77	25	26.39	13.520
Arietis		5.0	3	10	0.743	+3.4436	+20	43	48.35	+13.460
Horologii (G.)	†	5.7	3	10	23.763	1.5148	−57	38	22.62	13.511
Eridani		4.9	3	11	42.203	2.9124	− 9	8	5.10	13.486
τ Arietis		5.2	3	16	19.010	3.4593	+20	50	28.80	13.097
Eridani		4.3	3	16	31.960	+2.3980	−43	23	39.34	13.873
ι Hydri		5.5	3	18	3.138	−1.5535	−77	41	57.79	+13.055
α Persei		1.9	3	18	14.796	+4.2690	+49	33	34.51	12.974
ο Tauri		3.8	3	20	14.212	3.2254	+ 8	43	49.74	12.795
2 H. Camelopardalis		4.4	3	22	10.563	4.8372	+59	38	42.66	12.740
ξ Tauri		3.8	3	22	33.631	3.2484	+ 9	26	12.97	12.666
f Tauri		4.3	3	26	10.686	+3.3090	+12	38	46.18	+12.469
ε Eridani	†	3.8	3	28	55.491	2.8252	− 9	44	42.81	12.304
τ^5 Eridani		4.3	3	30	1.905	2.6483	−21	55	2.76	12.162
δ Persei		3.1	3	36	51.984	4.2599	+47	31	0.31	11.685
δ Eridani		3.7	3	39	10.548	2.8730	−10	3	2.13	12.287
ν Persei		3.9	3	39	24.843	+4.0669	+42	18	39.87	+11.540
5 H. Camelopardalis		4.7	3	41	21.890	6.2840	+71	4	17.87	11.343
η Tauri (*Alcyone*)	†	3.0	3	42	25.719	3.5616	+23	50	35.18	11.273
τ^6 Eridani		4.3	3	43	11.433	2.5806	−23	29	58.26	10.786
g Eridani		4.2	3	46	16.434	+2.2451	−36	27	24.91	11.016
γ Hydri		3.2	3	48	32.442	−0.9652	−74	29	58.93	+10.995
ζ Persei		2.9	3	48	47.105	+3.7656	+31	37	55.55	10.846
9 H. Camelopardalis	†	5.2	3	49	52.744	5.0940	+60	51	39.62	10.762
ε Persei	†	3.0	3	52	8.747	4.0192	+39	45	55.06	10.585
ξ Persei		4.0	3	53	26.756	3.8868	+35	32	50.68	10.498
γ Eridani		3.2	3	54	3.793	+2.7984	−13	44	58.63	+10.359
λ Tauri	†	*var.*	3	55	58.159	3.3215	+12	15	3.56	10.315
δ Reticuli		4.4	3	57	23.686	+0.9409	−61	38	22.80	+10.217

Persei, star $8^m.5$, 28″ n. pr.
Arietis, dup., $5^m.2$, $5^m.6$, 1″.2
Eridani, comp. $4^m.4$, f. 8″
Persei, var. irreg., $3^m.4$–$4^m.2$

β Persei, var. $2^d.87$, $2^m.1$–$3^m.2$
12 Eridani, comp. 7^m, 1″.4 n. pr.
38 Horologii, remarkable purplish red star.
ε Eridani, comp. 9^m, s. 7″

η Tauri, quad., comps. $6^m.3$, $7^m.6$, $8^m.2$, 117″, 181″, 190″
9 H. Camelop., comp. 8^m, 1″.9 n. f.
ε Persei, comp. 8^m, 8″.6 n. f.
λ Tauri, var., $3^d.95$, $3^m.3$–$4^m.2$

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)	τ	f	f′	G		H		Log g.	Log h.	i	Log
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
July 1	0.4977	+2.226	+0.012	335 46.0	22 23.1	171 30.4	11 26.0	1.20404	1.31023	+1.31	+0.11
2	0.5004	2.237	+0.005	335 46.6	22 23.1	170 37.7	11 22.5	1.20496	1.31004	1.44	0.15
3	0.5031	2.249	−0.001	335 51.1	22 23.4	169 44.9	11 19.0	1.20564	1.30983	1.58	0.19
4	0.5059	2.260	0.006	335 59.6	22 24.0	168 52.1	11 15.5	1.20631	1.30960	1.71	0.23
5	0.5086	2.271	0.010	336 11.1	22 24.7	167 59.2	11 11.9	1.20716	1.30936	1.84	0.26
h 6	0.5114	+2.283	−0.011	336 24.5	22 25.6	167 6.3	11 8.4	1.20839	1.30909	+1.97	+0.29
(19.0) 7	0.5141	2.294	0.010	336 38.1	22 26.5	166 13.3	11 4.9	1.20997	1.30881	2.10	0.3
8	0.5168	2.305	0.007	336 50.5	22 27.4	165 20.2	11 1.3	1.21198	1.30852	2.23	0.34
9	0.5196	2.316	−0.003	337 0.7	22 28.0	164 27.0	10 57.8	1.21433	1.30820	2.36	0.37
10	0.5223	2.327	+0.002	337 7.9	22 28.5	163 33.7	10 54.2	1.21692	1.30787	2.49	0.39
11	0.5250	+2.338	+0.006	337 11.4	22 28.8	162 40.4	10 50.7	1.21959	1.30752	+2.62	+0.41
12	0.5278	2.349	0.009	337 11.4	22 28.8	161 47.0	10 47.1	1.22222	1.30716	2.75	0.43
13	0.5305	2.360	0.010	337 8.5	22 28.6	160 53.5	10 43.6	1.22457	1.30679	2.88	0.45
14	0.5332	2.371	0.009	337 3.9	22 28.3	159 59.8	10 40.0	1.22654	1.30639	3.00	0.477
15	0.5360	2.382	+0.005	336 59.3	22 28.0	159 6.1	10 36.4	1.22802	1.30598	3.13	0.495
16	0.5387	+2.393	−0.001	336 56.7	22 27.8	158 12.3	10 32.8	1.22905	1.30555	+3.26	+0.51
17	0.5415	2.404	0.008	336 57.9	22 27.9	157 18.3	10 29.2	1.22972	1.30511	3.38	0.5
18	0.5442	2.414	0.014	337 3.4	22 28.2	156 24.3	10 25.6	1.23028	1.30466	3.50	0.544
19	0.5469	2.425	0.017	337 13.5	22 28.9	155 30.1	10 22.0	1.23102	1.30420	3.62	0.559
20	0.5497	2.435	0.017	337 26.9	22 29.8	154 35.8	10 18.4	1.23222	1.30373	3.74	0.573
h 21	0.5524	+2.446	−0.013	337 41.1	22 30.7	153 41.4	10 14.8	1.23400	1.30324	+3.86	+0.58
(20.0) 22	0.5552	2.457	−0.007	337 53.6	22 31.6	152 46.9	10 11.1	1.23638	1.30274	3.98	0.600
23	0.5579	2.466	+0.002	338 2.3	22 32.2	151 52.2	10 7.5	1.23921	1.30222	4.10	0.6130
24	0.5606	2.476	0.009	338 5.8	22 32.4	150 57.4	10 3.8	1.24220	1.30169	4.22	0.6251
25	0.5634	2.487	0.015	338 4.4	22 32.3	150 2.4	10 0.2	1.24501	1.30116	4.33	0.6369
26	0.5661	+2.497	+0.018	337 59.6	22 32.0	149 7.3	9 56.5	1.24749	1.30061	+4.45	+0.6482
27	0.5688	2.507	0.017	337 52.9	22 31.5	148 12.0	9 52.8	1.24939	1.30006	4.56	0.6591
28	0.5716	2.517	0.013	337 47.2	22 31.1	147 16.6	9 49.1	1.25071	1.29949	4.67	0.6696
29	0.5743	2.527	+0.007	337 44.0	22 30.9	146 21.0	9 45.4	1.25156	1.29892	4.78	0.6798
30	0.5771	2.536	0.000	337 44.2	22 31.0	145 25.3	9 41.7	1.25211	1.29834	4.89	0.6896
31	0.5798	+2.546	−0.005	337 48.1	22 31.2	144 29.4	9 38.0	1.25259	1.29775	+5.00	+0.6991
Aug. 1	0.5825	2.556	0.009	337 55.2	22 31.7	143 33.3	9 34.2	1.25320	1.29716	5.11	0.7082
2	0.5853	2.565	0.011	338 4.1	22 32.3	142 37.1	9 30.5	1.25406	1.29656	5.21	0.7171
3	0.5880	2.575	0.010	338 13.7	22 32.9	141 40.6	9 26.7	1.25528	1.29595	5.32	0.7257
4	0.5908	2.584	0.008	338 22.6	22 33.5	140 44.0	9 22.9	1.25684	1.29534	5.42	0.7340
h 5	0.5935	+2.594	−0.004	338 29.6	22 34.0	139 47.2	9 19.1	1.25871	1.29472	+5.52	+0.7420
(21.0) 6	0.5962	2.603	+0.001	338 34.1	22 34.3	138 50.2	9 15.3	1.26081	1.29410	5.62	0.7497
7	0.5990	2.612	0.005	338 35.7	22 34.4	137 53.1	9 11.5	1.26302	1.29347	5.72	0.7572
8	0.6017	2.621	0.009	338 34.1	22 34.3	136 55.8	9 7.7	1.26521	1.29284	5.81	0.7645
9	0.6044	2.630	0.011	338 29.9	22 34.0	135 58.2	9 3.9	1.26718	1.29223	5.91	0.7715
10	0.6072	+2.639	+0.010	338 23.8	22 33.6	135 0.5	9 0.0	1.26886	1.29160	+6.00	+0.7783
11	0.6099	2.647	0.007	338 17.4	22 33.2	134 2.7	8 56.2	1.27011	1.29097	6.09	0.7848
12	0.6126	2.656	+0.002	338 12.4	22 32.8	133 4.6	8 52.3	1.27092	1.29034	6.18	0.7912
13	0.6153	2.665	−0.005	338 10.4	22 32.7	132 6.3	8 48.4	1.27140	1.28971	6.27	0.7973
14	0.6181	2.673	0.011	338 12.4	22 32.8	131 7.8	8 44.5	1.27168	1.28909	6.36	0.8033
15	0.6209	+2.682	−0.015	338 18.6	22 33.2	130 9.2	8 40.6	1.27202	1.28847	+6.44	+0.8090
16	0.6236	+2.690	−0.017	338 28.3	22 33.9	129 10.4	8 36.7	1.27270	1.28785	+6.52	+0.8146

FOR WASHINGTON MEAN MIDNIGHT.

r Day. idereal our.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
g. 16	0.6236	+2.690	−0.017	338 28.3	22 33.9	129 10.4	8 36.7	1.27270	1.28785	+6.52	+0.8146
17	0.6263	2.698	0.014	338 39.3	22 34.6	128 11.4	8 32.8	1.27386	1.28725	6.61	0.8199
18	0.6291	2.707	0.009	338 49.9	22 35.3	127 12.2	8 28.8	1.27556	1.28664	6.68	0.8251
19	0.6318	2.715	−0.001	338 57.4	22 35.8	126 12.8	8 24.8	1.27769	1.28603	6.76	0.8301
20	0.6346	2.723	+0.007	339 0.8	22 36.1	125 13.2	8 20.9	1.28011	1.28543	6.84	0.8349
h 21	0.6373	+2.731	+0.013	338 59.5	22 36.0	124 13.5	8 16.9	1.28246	1.28484	+6.91	+0.8395
1.0) 22	0.6400	2.739	0.017	338 54.6	22 35.6	123 13.6	8 12.9	1.28450	1.28426	6.98	0.8440
23	0.6428	2.746	0.017	338 47.6	22 35.2	122 13.5	8 8.9	1.28606	1.28369	7.05	0.8483
24	0.6455	2.754	0.014	338 41.0	22 34.7	121 13.2	8 4.9	1.28712	1.28312	7.12	0.8524
25	0.6482	2.762	0.008	338 36.2	22 34.4	120 12.7	8 0.8	1.28769	1.28257	7.18	0.8564
26	0.6510	+2.769	+0.002	338 34.7	22 34.3	119 12.0	7 56.8	1.28794	1.28202	+7.25	+0.8603
27	0.6537	2.777	−0.004	338 36.8	22 34.5	118 11.2	7 52.7	1.28808	1.28149	7.31	0.8639
28	0.6565	2.784	0.009	338 42.1	22 34.8	117 10.2	7 48.7	1.28829	1.28097	7.37	0.8675
29	0.6592	2.792	0.011	338 49.6	22 35.3	116 9.0	7 44.6	1.28872	1.28047	7.43	0.8708
30	0.6619	2.799	0.011	338 58.2	22 35.9	115 7.7	7 40.5	1.28944	1.27997	7.48	0.8741
31	0.6647	+2.806	−0.009	339 6.4	22 36.4	114 6.1	7 36.4	1.29048	1.27950	+7.54	+0.8772
ept. 1	0.6674	2.814	0.006	339 13.3	22 36.9	113 4.4	7 32.3	1.29181	1.27903	7.59	0.8801
2	0.6702	2.821	−0.001	339 18.1	22 37.2	112 2.5	7 28.2	1.29337	1.27857	7.64	0.8829
3	0.6729	2.828	+0.004	339 20.3	22 37.3	111 0.5	7 24.0	1.29508	1.27814	7.68	0.8855
4	0.6756	2.835	0.008	339 19.7	22 37.2	109 58.4	7 19.9	1.29676	1.27773	7.73	0.8881
h 5	0.6784	+2.842	+0.010	339 16.6	22 37.1	108 56.0	7 15.7	1.29835	1.27733	+7.77	+0.8904
3.0) 6	0.6811	2.849	0.010	339 11.8	22 36.8	107 53.5	7 11.6	1.29968	1.27695	7.81	0.8927
7	0.6838	2.855	0.008	339 6.3	22 36.4	106 50.9	7 7.4	1.30064	1.27659	7.85	0.8948
8	0.6866	2.862	+0.004	339 1.8	22 36.1	105 48.2	7 3.2	1.30123	1.27625	7.88	0.8968
9	0.6893	2.869	−0.003	338 59.6	22 36.0	104 45.3	6 59.0	1.30146	1.27593	7.92	0.8986
10	0.6920	+2.876	−0.009	339 1.0	22 36.1	103 42.3	6 54.8	1.30147	1.27563	+7.95	+0.9004
11	0.6948	2.882	0.014	339 6.5	22 36.4	102 39.1	6 50.6	1.30149	1.27534	7.98	0.9019
12	0.6975	2.889	0.016	339 15.5	22 37.0	101 35.9	6 46.4	1.30172	1.27507	8.00	0.9034
13	0.7003	2.896	0.015	339 26.8	22 37.8	100 32.6	6 42.2	1.30236	1.27483	8.03	0.9047
14	0.7030	2.902	0.010	339 38.1	22 38.5	99 29.2	6 38.0	1.30353	1.27462	8.05	0.9059
15	0.7057	+2.909	−0.003	339 47.2	22 39.1	98 25.6	6 33.7	1.30514	1.27442	+8.07	+0.9070
16	0.7085	2.915	+0.005	339 52.7	22 39.5	97 22.0	6 29.5	1.30701	1.27425	8.09	0.9079
17	0.7112	2.922	0.012	339 54.0	22 39.6	96 18.4	6 25.2	1.30895	1.27410	8.11	0.9088
18	0.7140	2.928	0.016	339 51.6	22 39.4	95 14.6	6 21.0	1.31070	1.27397	8.12	0.9094
19	0.7167	2.935	0.017	339 46.7	22 39.1	94 10.8	6 16.7	1.31201	1.27387	8.13	0.9100
h 20	0.7194	+2.941	+0.015	339 41.5	22 38.8	93 6.9	6 12.5	1.31284	1.27379	+8.14	+0.9104
(0.0) 21	0.7222	2.948	0.010	339 37.8	22 38.5	92 3.0	6 8.2	1.31323	1.27373	8.14	0.9107
22	0.7249	2.954	+0.003	339 36.9	22 38.5	90 59.0	6 3.9	1.31325	1.27369	8.15	0.9109
23	0.7276	2.960	−0.003	339 39.7	22 38.6	89 55.0	5 59.7	1.31314	1.27368	8.15	0.9109
24	0.7304	2.967	0.008	339 45.7	22 39.0	88 50.9	5 55.4	1.31307	1.27370	8.14	0.9109
25	0.7331	+2.973	−0.011	339 54.4	22 39.6	87 46.9	5 51.1	1.31317	1.27374	+8.14	+0.9107
26	0.7359	2.980	0.012	340 4.3	22 40.3	86 42.8	5 46.8	1.31358	1.27379	8.14	0.9104
27	0.7386	2.986	0.010	340 14.4	22 41.0	85 38.6	5 42.6	1.31429	1.27387	8.13	0.9099
28	0.7413	2.993	0.007	340 23.4	22 41.6	84 34.5	5 38.3	1.31529	1.27398	8.12	0.9093
29	0.7441	2.999	−0.002	340 30.6	22 42.0	83 30.3	5 34.0	1.31654	1.27412	8.10	0.9086
30	0.7468	+3.006	+0.002	340 35.4	22 42.4	82 26.2	5 29.7	1.31791	1.27428	+8.09	+0.9078
Oct. 1	0.7496	+3.012	+0.006	340 37.7	22 42.5	81 22.1	5 25.5	1.31935	1.27446	+8.07	+0.9068

FOR WASHINGTON MEAN MIDNIGHT.

Solar Day. (Sidereal Hour.)		r	f	f′	G		H		Log g.	Log h.	i	Log
			In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
		y	s	s	° ′	h m	° ′	h m			″	
Oct.	1	0.7496	+3.012	+0.006	340 37.7	22 42.5	81 22.1	5 25.5	1.31935	1.27446	+8.07	+0.90
	2	0.7523	3.019	0.009	340 37.5	22 42.5	80 18.0	5 21.2	1.32067	1.27465	8.05	0.90
	3	0.7550	3.025	0.010	340 35.5	22 42.4	79 13.9	5 16.9	1.32184	1.27488	8.03	0.90
	4	0.7578	3.032	0.008	340 32.8	22 42.2	78 9.8	5 12.7	1.32269	1.27514	8.00	0.90
h	5	0.7605	3.039	+0.004	340 30.5	22 42.0	77 5.7	5 8.4	1.32320	1.27540	7.97	0.90
(1.0)	6	0.7632	+3.045	−0.001	340 30.1	22 42.0	76 1.7	5 4.1	1.32339	1.27569	+7.94	+0.8
	7	0.7660	3.052	0.007	340 32.9	22 42.2	74 57.8	4 59.9	1.32335	1.27601	7.91	0.8
	8	0.7687	3.059	0.012	340 39.6	22 42.6	73 53.9	4 55.6	1.32328	1.27634	7.88	0.8
	9	0.7714	3.066	0.015	340 49.9	22 43.3	72 50.1	4 51.3	1.32336	1.27669	7.84	0.8
	10	0.7742	3.072	0.015	341 2.7	22 44.2	71 46.4	4 47.1	1.32380	1.27706	7.80	0.8
	11	0.7769	+3.079	−0.011	341 16.2	22 45.1	70 42.7	4 42.8	1.32474	1.27746	+7.76	+0.88
	12	0.7797	3.086	−0.005	341 28.2	22 45.9	69 39.1	4 38.6	1.32614	1.27788	7.71	0.88
	13	0.7824	3.093	+0.003	341 37.2	22 46.5	68 35.6	4 34.4	1.32788	1.27831	7.67	0.88
	14	0.7851	3.100	0.011	341 42.0	22 46.8	67 32.3	4 30.2	1.32970	1.27876	7.62	0.88
	15	0.7879	3.107	0.016	341 43.1	22 46.9	66 29.0	4 25.9	1.33142	1.27923	7.57	0.87
	16	0.7906	+3.115	+0.018	341 41.4	22 46.8	65 25.8	4 21.7	1.33277	1.27971	+7.51	+0.87
	17	0.7934	3.122	0.017	341 38.8	22 46.6	64 22.7	4 17.5	1.33369	1.28021	7.46	0.87
	18	0.7961	3.129	0.012	341 37.2	22 46.5	63 19.8	4 13.3	1.33413	1.28072	7.40	0.86
	19	0.7988	3.137	+0.006	341 38.2	22 46.5	62 17.0	4 9.1	1.33426	1.28125	7.34	0.86
h	20	0.8016	3.144	−0.001	341 42.4	22 46.8	61 14.2	4 4.9	1.33418	1.28180	7.28	0.86
(2.0)	21	0.8043	+3.152	−0.007	341 50.0	22 47.3	60 11.6	4 0.8	1.33412	1.28235	+7.21	+0.8
	22	0.8070	3.159	0.010	342 0.2	22 48.0	59 9.1	3 56.6	1.33422	1.28292	7.14	0.85
	23	0.8098	3.167	0.012	342 12.1	22 48.8	58 6.8	3 52.5	1.33462	1.28350	7.08	0.84
	24	0.8125	3.175	0.011	342 24.3	22 49.6	57 4.7	3 48.3	1.33533	1.28409	7.00	0.845
	25	0.8153	3.182	0.008	342 35.4	22 50.4	56 2.6	3 44.2	1.33635	1.28469	6.93	0.84
	26	0.8180	+3.190	−0.004	342 45.3	22 51.0	55 0.7	3 40.0	1.33760	1.28530	+6.86	+0.836
	27	0.8207	3.198	+0.001	342 52.6	22 51.5	53 58.9	3 35.9	1.33901	1.28591	6.78	0.831
	28	0.8235	3.207	0.005	342 57.6	22 51.8	52 57.2	3 31.8	1.34050	1.28654	6.70	0.825
	29	0.8262	3.215	0.008	343 0.1	22 52.0	51 55.7	3 27.7	1.34192	1.28717	6.62	0.820
	30	0.8290	3.223	0.009	343 0.6	22 52.0	50 54.4	3 23.6	1.34318	1.28780	6.53	0.815
	31	0.8317	+3.232	+0.008	343 0.3	22 52.0	49 53.2	3 19.5	1.34419	1.28844	+6.45	+0.809
Nov.	1	0.8344	3.240	+0.005	342 59.9	22 52.0	48 52.1	3 15.5	1.34490	1.28909	6.36	0.803
	2	0.8372	3.249	0.000	343 1.0	22 52.1	47 51.2	3 11.4	1.34532	1.28974	6.27	0.797
	3	0.8399	3.257	−0.006	343 4.8	22 52.3	46 50.4	3 7.4	1.34552	1.29040	6.18	0.790
	4	0.8426	3.266	0.012	343 12.2	22 52.8	45 49.8	3 3.3	1.34565	1.29105	6.08	0.784
h	5	0.8454	+3.275	−0.016	343 23.0	22 53.4	44 49.2	2 59.3	1.34593	1.29171	+5.98	+0.777
(3.0)	6	0.8481	3.284	0.016	343 36.4	22 54.4	43 48.9	2 55.3	1.34651	1.29237	5.89	0.770
	7	0.8508	3.293	0.014	343 50.9	22 55.4	42 48.8	2 51.3	1.34757	1.29303	5.79	0.7626
	8	0.8536	3.302	−0.008	344 4.4	22 56.3	41 48.7	2 47.3	1.34907	1.29368	5.69	0.7549
	9	0.8563	3.311	0.000	344 15.4	22 57.0	40 48.8	2 43.3	1.35095	1.29433	5.58	0.7469
	10	0.8591	+3.321	+0.008	344 22.4	22 57.4	39 49.1	2 39.3	1.35299	1.29498	+5.48	+0.7387
	11	0.8618	3.330	0.015	344 25.7	22 57.7	38 49.6	2 35.3	1.35492	1.29563	5.37	0.7301
	12	0.8645	3.340	0.019	344 25.7	22 57.7	37 50.2	2 31.3	1.35659	1.29626	5.26	0.7213
	13	0.8673	3.349	0.018	344 24.6	22 57.6	36 50.9	2 27.4	1.35790	1.29690	5.15	0.7121
	14	0.8700	3.359	0.015	344 23.8	22 57.4	35 51.8	2 23.5	1.35874	1.29753	5.04	0.7026
	15	0.8728	+3.369	+0.009	344 24.9	22 57.5	34 52.9	2 19.5	1.35918	1.29816	+4.93	+0.6927
	16	0.8755	+3.379	+0.002	344 29.1	22 57.9	33 54.1	2 15.6	1.35944	1.29877	+4.81	+0.6825

FOR WASHINGTON MEAN MIDNIGHT.

Day. ereal ur.)	τ	f	f′	G		H		Log g.	Log h.	i	Log i.
		In Time.	In Time.	In Arc.	In Time.	In Arc.	In Time.				
	y	s	s	° ′	h m	° ′	h m			″	
. 16	0.8755	+3.379	+0.002	344 29.1	22 57.9	33 54.1	2 15.6	1.35944	1.29877	+4.81	+0.6825
17	0.8782	3.389	−0.004	344 36.4	22 58.4	32 55.4	2 11.7	1.35967	1.29937	4.70	0.6718
18	0.8810	3.399	0.009	344 46.5	22 59.1	31 56.8	2 7.8	1.36002	1.29996	4.58	0.6608
19	0.8837	3.409	0.011	344 58.1	22 59.9	30 58.4	2 3.9	1.36065	1.30055	4.46	0.6493
20	0.8864	3.420	0.011	345 10.3	23 0.7	30 0.2	2 0.0	1.36160	1.30113	4.34	0.6374
) 21	0.8892	+3.430	−0.008	345 21.7	23 1.4	29 2.1	1 56.1	1.36285	1.30170	+4.22	+0.6250
22	0.8919	3.440	−0.005	345 31.4	23 2.1	28 4.1	1 52.3	1.36431	1.30226	4.09	0.6121
23	0.8947	3.451	0.000	345 39.1	23 2.6	27 6.2	1 48.4	1.36596	1.30280	3.97	0.5986
24	0.8974	3.462	+0.004	345 44.2	23 2.9	26 8.4	1 44.6	1.36766	1.30333	3.84	0.5846
25	0.9002	3.472	0.008	345 47.1	23 3.1	25 10.8	1 40.7	1.36935	1.30384	3.72	0.5700
26	0.9029	+3.483	+0.009	345 47.9	23 3.2	24 13.2	1 36.9	1.37088	1.30434	+3.59	+0.5547
27	0.9056	3.494	0.009	345 47.5	23 3.2	23 15.8	1 33.1	1.37219	1.30484	3.46	0.5387
28	0.9084	3.505	0.006	345 46.9	23 3.1	22 18.5	1 29.2	1.37323	1.30531	3.33	0.5219
29	0.9111	3.516	+0.001	345 47.2	23 3.1	21 21.3	1 25.4	1.37399	1.30577	3.19	0.5043
30	0.9138	3.527	−0.005	345 49.6	23 3.3	20 24.1	1 21.6	1.37452	1.30620	3.06	0.4858
c. 1	0.9166	+3.538	−0.011	345 55.0	23 3.7	19 27.1	1 17.8	1.37497	1.30663	+2.93	+0.4664
2	0.9193	3.550	0.016	346 3.6	23 4.2	18 30.2	1 14.0	1.37551	1.30704	2.79	0.4458
3	0.9220	3.561	0.018	346 14.9	23 5.0	17 33.3	1 10.2	1.37631	1.30743	2.66	0.4242
4	0.9248	3.572	0.016	346 27.4	23 5.8	16 36.5	1 6.4	1.37751	1.30781	2.52	0.4012
5	0.9275	3.584	0.011	346 39.4	23 6.6	15 39.8	1 2.7	1.37916	1.30816	2.38	0.3768
0) 6	0.9302	+3.595	−0.004	346 49.2	23 7.3	14 43.2	0 58.9	1.38117	1.30850	+2.24	+0.3507
7	0.9330	3.607	+0.005	346 55.7	23 7.7	13 46.6	0 55.1	1.38342	1.30882	2.10	0.3229
8	0.9357	3.618	0.013	346 58.3	23 7.9	12 50.1	0 51.3	1.38563	1.30911	1.96	0.2930
9	0.9385	3.630	0.018	346 57.8	23 7.9	11 53.7	0 47.6	1.38762	1.30938	1.82	0.2608
10	0.9412	3.642	0.019	346 55.5	23 7.7	10 57.3	0 43.8	1.38923	1.30965	1.68	0.2257
11	0.9439	+3.654	+0.017	346 53.0	23 7.5	10 0.9	0 40.1	1.39043	1.30989	+1.54	+0.1875
12	0.9467	3.665	0.012	346 52.1	23 7.5	9 4.7	0 36.3	1.39126	1.31010	1.40	0.1454
13	0.9494	3.677	+0.005	346 53.6	23 7.6	8 8.5	0 32.6	1.39182	1.31030	1.26	0.0987
14	0.9522	3.689	−0.002	346 58.2	23 7.9	7 12.3	0 28.8	1.39231	1.31047	1.11	0.0461
15	0.9549	3.701	0.007	347 5.3	23 8.4	6 16.1	0 25.1	1.39289	1.31063	0.97	9.9861
16	0.9576	+3.713	−0.010	347 14.2	23 8.9	5 20.0	0 21.3	1.39369	1.31076	+0.83	+9.9163
17	0.9604	3.725	0.010	347 23.6	23 9.6	4 23.9	0 17.6	1.39476	1.31088	0.68	9.8329
18	0.9631	3.736	0.009	347 32.4	23 10.2	3 27.8	0 13.9	1.39610	1.31098	0.54	9.7294
19	0.9658	3.748	0.005	347 39.9	23 10.7	2 31.8	0 10.1	1.39771	1.31104	0.39	9.5931
20	0.9686	3.760	−0.001	347 45.3	23 11.0	1 35.8	0 6.4	1.39942	1.31109	0.25	9.3931
h .0) 21	0.9713	+3.772	+0.004	347 48.7	23 11.2	0 39.7	0 2.6	1.40121	1.31111	+0.10	+9.0107
22	0.9741	3.784	0.007	347 49.4	23 11.3	359 43.6	23 58.9	1.40300	1.31111	−0.04	−8.6260
23	0.9768	3.796	0.010	347 48.3	23 11.2	358 47.6	23 55.2	1.40463	1.31110	0.19	9.2719
24	0.9795	3.808	0.010	347 45.9	23 11.1	357 51.5	23 51.4	1.40610	1.31107	0.33	9.5208
25	0.9823	3.820	0.008	347 43.1	23 10.9	356 55.4	23 47.7	1.40730	1.31100	0.48	9.6780
26	0.9850	+3.832	+0.003	347 40.8	23 10.7	355 59.3	23 44.0	1.40824	1.31092	−0.62	−9.7931
27	0.9878	3.844	−0.003	347 40.0	23 10.7	355 3.1	23 40.2	1.40891	1.31081	0.76	9.8838
28	0.9905	3.856	0.009	347 41.8	23 10.8	354 6.9	23 36.5	1.40948	1.31069	0.91	9.9588
29	0.9932	3.868	0.015	347 46.4	23 11.1	353 10.7	23 32.7	1.41007	1.31055	1.05	0.0226
30	0.9960	3.880	0.018	347 53.6	23 11.6	352 14.4	23 29.0	1.41084	1.31038	1.20	0.0780
31	0.9987	+3.892	−0.018	348 2.3	23 12.2	351 18.1	23 25.2	1.41194	1.31019	−1.34	−0.1271
32	1.0014	+3.903	−0.014	348 11.0	23 12.7	350 21.7	23 21.4	1.41344	1.30998	−1.48	−0.1711

FOR WASHINGTON SIDEREAL TWELVE HOURS.

Mean Solar Date.	Log A_1.	Log B_1.	Log C.	Log D.	f	G_1	H	Log g_1.	Log h.	Log
					s	° ′	° ′			
Jan. 0.72	+9.2573	−0.8651	−0.5110	+1.3045	+0.557	296 19	350 52	0.9126	1.3101	−0.14
10.70	9.3405	0.8683	0.8100	1.2838	0.674	300 44	341 26	0.9340	1.3070	0.44
20.67	9.4068	0.8745	0.9761	1.2475	0.786	304 20	331 50	0.9576	1.3022	0.61
30.64	9.4602	0.8826	1.0853	1.1928	0.888	307 10	322 1	0.9811	1.2962	0.72
Feb. 9.61	9.5034	0.8910	1.1611	1.1145	0.981	309 23	311 56	1.0029	1.2896	0.79
19.59	+9.5389	−0.8985	−1.2137	+1.0023	+1.065	311 13	301 34	1.0221	1.2833	−0.85
Mar. 1.56	9.5685	0.9040	1.2483	0.8323	1.139	312 48	290 59	1.0384	1.2781	0.88
11.53	9.5940	0.9066	1.2678	+0.5247	1.208	314 18	280 14	1.0519	1.2748	0.90
21.50	9.6171	0.9057	1.2736	−9.2669	1.274	315 53	269 26	1.0630	1.2737	0.91
31.48	9.6390	0.9012	1.2665	0.5670	1.340	317 37	258 42	1.0725	1.2750	0.90
Apr. 10.45	+9.6608	−0.8934	−1.2461	−0.8492	+1.409	319 33	248 9	1.0814	1.2785	−0.88
20.42	9.6832	0.8827	1.2114	1.0095	1.484	321 42	237 52	1.0905	1.2836	0.84
30.40	9.7066	0.8700	1.1601	1.1161	1.565	323 59	227 54	1.1006	1.2897	0.79
May 10.37	9.7310	0.8562	1.0879	1.1909	1.655	326 21	218 16	1.1126	1.2960	0.72
20.34	9.7561	0.8425	0.9864	1.2439	1.753	328 40	208 56	1.1266	1.3018	0.62
30.31	+9.7815	−0.8302	−0.8377	−1.2798	+1.859	330 50	199 52	1.1424	1.3065	−0.47
June 9.28	9.8068	0.8204	0.5898	1.3016	1.971	332 46	190 59	1.1598	1.3096	0.22
19.26	9.8312	0.8139	−9.9005	1.3107	2.085	334 23	182 14	1.1782	1.3110	−9.53
29.23	9.8546	0.8112	+0.3647	1.3078	2.200	335 42	173 30	1.1969	1.3106	+0.00
July 9.20	9.8763	0.8123	0.7293	1.2926	2.313	336 42	164 43	1.2152	1.3083	0.36
19.18	+9.8962	−0.8166	+0.9171	−1.2644	+2.422	337 27	155 48	1.2327	1.3044	+0.55
29.15	9.9141	0.8232	1.0389	1.2211	2.524	337 58	146 41	1.2490	1.2991	0.67
Aug. 8.12	9.9300	0.8310	1.1245	1.1592	2.618	338 20	137 17	1.2638	1.2931	0.76
18.09	9.9441	0.8387	1.1857	1.0723	2.703	338 37	127 36	1.2771	1.2869	0.82
28.07	9.9564	0.8451	1.2287	0.9473	2.781	338 53	117 37	1.2886	1.2812	0.86
Sept. 7.04	+9.9674	−0.8491	+1.2566	−0.7508	+2.852	339 12	107 20	1.2987	1.2768	+0.89
17.01	9.9774	0.8500	1.2711	−0.3491	2.919	339 36	96 49	1.3076	1.2742	0.90
26.98	9.9869	0.8471	1.2729	+0.0958	2.983	340 7	86 12	1.3156	1.2738	0.91
Oct. 6.96	9.9963	0.8402	1.2618	0.6732	3.048	340 48	75 32	1.3232	1.2758	0.89
16.93	0.0061	0.8294	1.2371	0.9061	3.118	341 38	64 59	1.3308	1.2799	0.87
26.90	+0.0166	−0.8151	+1.1967	+1.0484	+3.194	342 35	54 36	1.3390	1.2855	+0.83
Nov. 5.88	0.0279	0.7985	1.1371	1.1456	3.278	343 36	44 26	1.3479	1.2920	0.77
15.85	0.0402	0.7806	1.0519	1.2142	3.372	344 39	34 32	1.3580	1.2984	0.68
25.82	0.0533	0.7633	0.9278	1.2617	3.476	345 39	24 52	1.3691	1.3040	0.56
Dec. 5.79	0.0670	0.7482	0.7320	1.2924	3.587	346 32	15 23	1.3811	1.3083	0.36
15.77	+0.0809	−0.7371	+0.3314	+1.3083	+3.704	347 16	6 1	1.3937	1.3107	+0.96
25.74	0.0947	0.7311	−0.0711	1.3102	3.823	347 49	356 42	1.4065	1.3110	−9.70
35.71	+0.1079	−0.7306	−0.6501	+1.2985	+3.941	348 11	347 20	1.4192	1.3092	−0.28

E= $+0^{s}.002$.

The above numbers give the same reductions from mean to apparent place as are employed in computing the apparent places of the fixed stars, given on pages 287 to 486, from the mean places, given on pages 233 to 250. In order to render exact interpolation possible through intervals of ten days, all short period terms have been omitted.

FOR WASHINGTON MEAN MIDNIGHT.

ate.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω
	″	″		″	″		″	″		″	″
0	+0.02	−0.10	Feb. 15	+0.11	+0.10	Apr. 1	−0.24	+0.02	May 17	+0.05	−0.08
1	0.10	0.07	16	0.00	0.10	2	0.21	−0.04	18	0.12	0.06
2	0.16	−0.04	17	−0.10	0.08	3	0.13	0.08	19	0.15	−0.02
3	0.18	+0.01	18	0.17	0.05	4	−0.02	0.11	20	0.14	+0.03
4	0.15	0.06	19	0.21	+0.01	5	+0.11	0.11	21	+0.09	0.07
5	+0.07	0.09	20	0.21	−0.03	6	0.22	0.08	22	0.00	0.10
6	−0.03	0.11	21	0.18	0.07	7	0.29	−0.04	23	−0.10	0.10
7	0.14	0.10	22	0.12	0.09	8	0.31	+0.01	24	0.20	0.09
8	0.23	0.07	23	−0.04	0.10	9	0.26	0.06	25	0.26	+0.05
9	0.27	+0.02	24	+0.05	0.09	10	0.18	0.09	26	0.27	0.00
10	−0.24	−0.04	25	+0.12	−0.06	11	+0.07	+0.10	27	−0.22	−0.05
11	0.17	0.08	26	0.17	−0.02	12	−0.04	0.09	28	0.12	0.09
12	−0.05	0.11	27	0.17	+0.03	13	0.13	0.07	29	−0.01	0.11
13	+0.09	0.11	28	0.13	0.07	14	0.19	+0.03	30	+0.15	0.10
14	0.20	0.08	Mar. 1	+0.05	0.10	15	0.24	−0.01	31	0.26	0.07
15	0.28	−0.04	2	−0.05	0.11	16	0.20	0.05	June 1	0.31	−0.02
16	0.30	+0.01	3	0.15	0.09	17	0.15	0.08	2	0.31	+0.03
17	0.26	0.06	4	0.22	+0.05	18	0.09	0.10	3	0.26	0.07
18	0.19	0.09	5	0.24	0.00	19	−0.01	0.10	4	0.16	0.10
19	+0.08	0.10	6	0.20	−0.05	20	+0.07	0.08	5	+0.05	0.10
20	−0.02	+0.10	7	−0.11	−0.09	21	+0.12	−0.05	6	−0.05	+0.09
21	0.12	0.07	8	+0.02	0.11	22	0.15	0.00	7	0.13	0.06
22	0.18	+0.04	9	0.14	0.10	23	0.13	+0.04	8	0.18	+0.01
23	0.21	0.00	10	0.24	0.07	24	+0.07	0.08	9	0.19	−0.03
24	0.20	−0.04	11	0.29	−0.02	25	−0.02	0.10	10	0.16	0.06
25	0.16	0.08	12	0.29	+0.03	26	0.12	0.10	11	0.11	0.09
26	0.09	0.10	13	0.23	0.07	27	0.21	0.08	12	−0.03	0.10
27	−0.01	0.10	14	0.14	0.10	28	0.25	+0.03	13	+0.04	0.09
28	+0.08	0.08	15	+0.03	0.10	29	0.24	−0.02	14	0.11	0.07
29	0.15	−0.05	16	−0.07	0.09	30	0.18	0.07	15	0.15	−0.03
30	+0.18	0.00	17	−0.15	+0.06	May 1	−0.06	−0.10	16	+0.16	+0.02
31	0.17	+0.04	18	0.20	+0.02	2	+0.07	0.11	17	0.12	0.06
eb. 1	0.11	0.08	19	0.21	−0.02	3	0.20	0.09	18	+0.04	0.09
2	+0.02	0.10	20	0.19	0.06	4	0.29	−0.05	19	−0.06	0.10
3	−0.09	0.10	21	0.14	0.09	5	0.32	0.00	20	0.17	0.09
4	0.19	0.08	22	−0.07	0.10	6	0.30	+0.05	21	0.25	0.06
5	0.25	+0.03	23	+0.02	0.09	7	0.22	0.08	22	0.29	+0.01
6	0.25	−0.02	24	0.09	0.07	8	0.12	0.10	23	0.26	−0.04
7	0.19	0.07	25	0.14	−0.03	9	+0.01	0.10	24	0.18	0.08
8	−0.08	0.10	26	0.16	+0.01	10	−0.09	0.08	25	−0.06	0.11
9	+0.05	−0.11	27	+0.13	+0.06	11	−0.16	+0.04	26	+0.08	−0.10
10	0.17	0.09	28	+0.06	0.09	12	0.20	0.00	27	0.20	0.08
11	0.25	0.05	29	−0.03	0.11	13	0.20	−0.04	28	0.29	−0.04
12	0.29	−0.01	30	0.13	0.10	14	0.16	0.07	29	0.31	+0.02
13	0.27	+0.04	31	0.21	0.06	15	0.10	0.09	30	0.27	0.06
14	0.20	0.08	Apr. 1	0.24	+0.02	16	−0.02	0.10	July 1	0.19	0.09
15	+0.11	+0.10	2	−0.21	−0.04	17	+0.05	−0.08	2	+0.09	+0.10

FOR WASHINGTON MEAN MIDNIGHT.

Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″ω	Date.	δ″ψ	δ″
	″	″		″	″		″	″		″	
July 1	+0.19	+0.09	Aug. 16	−0.27	0.00	Oct. 1	+0.10	−0.07	Nov. 16	+0.03	+0.
2	+0.09	0.10	17	0.23	−0.05	2	0.14	−0.04	17	−0.07	0.
3	−0.02	0.09	18	0.14	0.09	3	0.16	+0.01	18	0.14	0.
4	0.11	0.07	19	−0.02	0.11	4	0.13	0.05	19	0.18	+0.
5	0.16	+0.03	20	+0.11	0.10	5	+0.07	0.08	20	0.17	−0.
6	0.18	−0.01	21	0.22	0.07	6	−0.02	0.10	21	0.14	0.
7	0.16	0.05	22	0.27	−0.02	7	0.12	0.10	22	−0.07	0.
8	0.12	0.08	23	0.27	+0.03	8	0.20	0.07	23	0.00	0.
9	−0.05	0.10	24	0.22	0.08	9	0.25	+0.03	24	+0.07	0.
10	+0.03	0.09	25	0.13	0.10	10	0.25	−0.02	25	0.12	0.
11	+0.10	−0.07	26	+0.03	+0.10	11	−0.19	−0.07	26	+0.15	−0.
12	0.15	−0.04	27	−0.07	0.08	12	−0.08	0.10	27	0.14	+0.
13	0.17	0.00	28	0.14	0.05	13	+0.05	0.11	28	0.10	0.
14	0.15	+0.05	29	0.18	+0.01	14	0.17	0.09	29	+0.02	0.
15	+0.08	0.08	30	0.18	−0.03	15	0.26	−0.05	30	−0.08	0.
16	−0.02	0.10	31	0.15	0.07	16	0.30	0.00	Dec. 1	0.18	0.
17	0.12	0.10	Sept. 1	0.09	0.09	17	0.27	+0.05	2	0.26	0.
18	0.22	0.07	2	−0.02	0.10	18	0.20	0.09	3	0.29	+0.
19	0.28	+0.03	3	+0.06	0.09	19	+0.10	0.10	4	0.26	−0.
20	0.28	−0.02	4	0.12	0.06	20	−0.01	0.10	5	0.18	0.
21	−0.22	−0.07	5	+0.16	−0.02	21	−0.11	+0.07	6	−0.06	−0.1
22	−0.11	0.10	6	0.17	+0.02	22	0.17	+0.04	7	+0.08	0.1
23	+0.02	0.11	7	0.13	0.06	23	0.19	−0.01	8	0.21	0.
24	0.15	0.09	8	+0.06	0.09	24	0.17	0.05	9	0.29	−0.
25	0.25	−0.05	9	−0.04	0.10	25	0.13	0.08	10	0.31	+0.
26	0.29	0.00	10	0.14	0.09	26	−0.06	0.09	11	0.27	0.
27	0.27	+0.05	11	0.22	0.06	27	+0.01	0.09	12	0.19	0.1
28	0.21	0.08	12	0.26	+0.01	28	0.08	0.08	13	+0.08	0.1
29	0.11	0.10	13	0.24	−0.04	29	0.13	0.05	14	−0.03	0.
30	+0.01	0.10	14	0.16	0.08	30	0.15	−0.01	15	0.11	0.
31	−0.09	+0.08	15	−0.05	−0.11	31	+0.14	+0.03	16	−0.16	+0.
Aug. 1	0.15	+0.04	16	+0.08	0.10	Nov. 1	+0.08	0.07	17	0.17	−0.
2	0.18	0.00	17	0.19	0.08	2	0.00	0.10	18	0.14	0.
3	0.17	−0.04	18	0.27	−0.03	3	−0.10	0.10	19	0.08	0.
4	0.13	0.07	19	0.28	+0.02	4	0.19	0.08	20	−0.01	0.
5	−0.07	0.09	20	0.24	0.06	5	0.26	+0.05	21	+0.06	0.
6	+0.01	0.09	21	0.16	0.09	6	0.27	0.00	22	0.12	0.
7	0.08	0.08	22	+0.05	0.10	7	0.22	−0.05	23	0.16	−0.
8	0.14	0.05	23	−0.05	0.09	8	−0.12	0.09	24	0.16	+0.
9	0.17	−0.01	24	0.13	0.06	9	+0.01	0.11	25	0.12	0.
10	+0.16	+0.03	25	−0.18	+0.02	10	+0.14	−0.10	26	+0.06	+0.
11	0.11	0.07	26	0.19	−0.02	11	0.25	0.06	27	−0.04	0.1
12	+0.03	0.10	27	0.16	0.07	12	0.30	−0.02	28	0.15	0.1
13	−0.08	0.10	28	0.11	0.08	13	0.30	+0.03	29	0.24	0.
14	0.18	0.09	29	−0.04	0.09	14	0.24	0.08	30	0.29	+0.
15	0.25	+0.05	30	+0.03	0.09	15	0.14	0.10	31	0.29	−0.
16	−0.27	0.00	Oct. 1	+0.10	−0.07	16	+0.03	+0.10	32	−0.23	−0.

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Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
Piscium	4.7	0 0 59.112	+ 3.0714	− 6 10 59.04	+20.136
Andromedæ (*Alpheratz*)	2.2	0 3 59.450	3.0960	+28 37 16.23	19.880
Cassiopeiæ	2.4	0 4 38.056	3.1851	+58 40 51.55	19.861
Phœnicis	3.9	0 5 5.987	3.0512	−46 12 59.41	19.848
Andromedæ	5.1	0 5 53.898	3.1098	+45 35 57.38	20.034
Pegasi	2.9	0 8 51.420	+ 3.0865	+14 42 39.81	+20.021
Andromedæ	4.5	0 13 52.995	3.1276	+36 18 50.41	19.962
Ceti	3.8	0 15 5.845	3.0569	− 9 17 42.12	19.973
Tucanæ	4.3	0 15 39.189	3.1477	−65 22 26.29	21.171
Piscium	6.0	0 21 2.687	3.0744	+ 1 28 8.31	19.938
Hydri	2.9	0 21 18.226	+ 3.2000	−77 43 58.65	+20.277
Phœnicis	2.4	0 22 5.172	2.9725	−42 46 3.30	19.550
2 Ceti	6.0	0 25 42.071	3.0622	− 4 25 36.49	19.919
3 Ceti †	5.2	0 30 52.341	3.0871	− 4 3 38.03	19.847
Cassiopeiæ	3.7	0 32 13.732	3.3288	+53 25 45.39	19.841
Andromedæ	4.4	0 32 20.224	+ 3.1977	+33 15 5.76	+19.847
ε Andromedæ	4.5	0 34 3.624	3.1644	+28 51 1.40	19.571
δ Andromedæ	3.5	0 34 46.744	3.2021	+30 23 45.13	19.718
α Cassiopeiæ (*Schedir*) †	*var.*	0 35 40.497	3.3869	+56 4 16.87	19.771
μ Phœnicis	4.6	0 37 18.605	2.8393	−46 33 6.68	19.749
β Ceti	2.2	0 39 19.419	+ 3.0125	−18 27 10.44	+19.793
o Cassiopeiæ	4.7	0 39 58.953	3.3314	+47 49 9.82	19.735
1 Cassiopeiæ	5.6	0 40 0.695	3.9060	+74 31 25.22	19.715
ζ Andromedæ	4.3	0 42 49.797	3.1748	+23 48 17.90	19.618
η Cassiopeiæ †	3.6	0 43 56.963	3.6136	+57 21 57.15	19.202
δ Piscium	4.6	0 44 16.251	+ 3.1101	+ 7 7 21.73	+19.629
λ Hydri	5.0	0 45 39.057	2.1010	−75 23 8.87	19.649
20 Ceti	4.9	0 48 39.747	3.0642	− 1 36 19.65	19.592
γ Cassiopeiæ	2.2	0 51 34.034	3.5980	+60 15 24.17	19.535
μ Andromedæ	3.9	0 52 1.817	3.3211	+38 2 18.68	19.561
α Sculptoris	4.4	0 54 30.589	+ 2.8904	−29 49 0.63	+19.468
43 H. Cephei	4.5	0 56 54.030	7.6192	+85 48 6.45	19.427
ε Piscium	4.4	0 58 31.808	3.1112	+ 7 25 57.90	19.421
β Phœnicis †	3.4	1 2 17.447	2.6798	−47 10 26.62	19.286
μ Cassiopeiæ	5.3	1 2 36.265	3.9699	+54 30 14.24	17.747
η Ceti	3.6	1 4 18.827	+ 3.0175	−10 37 56.92	+19.136
β Andromedæ	2.4	1 4 58.060	3.3508	+35 10 12.60	19.129
τ Piscium	4.7	1 6 58.496	3.2972	+29 38 19.22	19.167
ζ Piscium †	5.6	1 9 17.333	3.1319	+ 7 7 34.20	19.084
κ Tucanæ †	5.0	1 12 53.231	2.0395	−69 19 39.52	19.129
f Piscium	5.3	1 13 24.803	+ 3.0926	+ 3 10 1.65	+19.000
υ Piscium	4.7	1 14 47.437	3.2908	+26 49 3.41	18.979
θ Ceti	3.8	1 19 46.449	2.9978	− 8 37 17.93	18.629
δ Cassiopeiæ	2.8	1 20 14.640	3.9006	+59 47 38.69	18.793
γ Phœnicis	3.4	1 24 40.499	2.6076	−43 45 13.17	18.468
38 Cassiopeiæ	6.0	1 24 52.980	+ 4.4156	+69 49 39.72	+18.614
η Piscium	3.7	1 26 55.924	3.2059	+14 54 28.83	18.618
α Ursæ Min. (*Polaris*) †	2.1	1 29 15.60*	+28.5356	+88 51 6.49	+18.547

13 Ceti, dup. $5^m.5$, $6^m.2$, $0''.3$
α Cassiop., var. irreg. $2^m.2$, $2^m.8$
η Cassiop. comp. $7^m.6$, $4''$ s. pr.

β Phœnicis, dup. $4^m.1$, $4^m.1$, $1''$.
ζ Piscium, star $6^m.5$, $24''$ n.f.

κ Tucanæ, comp. 7^m, $6''$ n.
α Ursæ Min., star 9^m, $18''$ s. pr.

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Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
40 Cassiopeiæ	5.5	1 31 41.838	+4.7333	+72 36 26.78	+18.461
υ Andromedæ	4.2	1 31 48.127	3.5100	+40 58 50.71	18.081
π Piscium	5.6	1 32 35.397	3.1766	+11 42 25.42	18.46
υ Persei	3.8	1 32 46.020	3.6676	+48 11 52.66	18.30
α Eridani (*Achernar*)	0.6	1 34 32.979	2.2364	−57 40 6.31	18.32
ω Cassiopeiæ	5.5	1 36 1.604	+4.4015	+67 36 49.20	+18.31
ν Piscium	4.7	1 37 0.378	3.1197	+ 5 3 28.40	18.28
φ Persei	4.2	1 38 19.473	3.7444	+50 15 39.68	18.21
τ Ceti	3.6	1 40 7.122	2.7866	−16 23 4.87	19.00
ο Piscium	4.5	1 40 54.186	3.1650	+ 8 43 49.10	18.17
ε Sculptoris . †	5.4	1 41 39.682	+2.8046	−25 28 36.93	+18.05
4 Octántis (G.)	5.6	1 42 9.88*	−3.7794	−85 11 57.70	18.11
ζ Ceti	3.9	1 47 15.863	+2.9601	−10 45 16.15	17.86
α Trianguli	3.6	1 48 13.918	3.4134	+29 9 54.88	17.60
ε Cassiopeiæ	3.4	1 48 15.916	4.2844	+63 15 7.54	17.83
ξ Piscium	4.8	1 49 9.215	+3.1038	+ 2 46 6.08	+17.835
β Arietis	2.7	1 49 56.440	3.3083	+20 23 34.70	17.67
ψ Phœnicis	4.4	1 50 14.194	2.4036	−46 43 8.20	17.667
υ Ceti	4.2	1 55 59.966	2.8257	−21 29 21.17	17.52
α Hydri	3.0	1 56 5.081	1.8818	−61 58 59.49	17.555
50 Cassiopeiæ	4.1	1 56 8.901	+5.0610	+72 0 38.42	+17.54
γ Andromedæ *pr.*	2.3	1 58 40.520	3.6712	+41 55 20.73	17.367
γ Anrdomedæ *seq.*	5.1	$\Delta\alpha$ + 0.890	. . . .	$\Delta\delta$ + 4.66	. . . .
α Arietis	2.2	2 2 22.676	3.3761	+23 3 39.78	17.111
β Trianguli	3.1	2 4 28.842	3.5615	+34 35 8.76	17.116
55 Cassiopeiæ	6.2	2 7 47.612	+4.6684	+66 7 36.26	+17.007
6 Persei	5.4	2 7 56.608	3.9734	+50 40 17.60	16.835
ξ^1 Ceti	4.5	2 8 29.556	3.1769	+ 8 26 54.17	16.961
μ Fornacis	5.2	2 9 9.631	2.6378	−31 7 20.88	16.923
γ Trianguli	4.1	2 12 15.373	3.5584	+33 27 16.74	16.747
67 Ceti	5.7	2 12 44.552	+2.9906	− 6 48 48.36	+16.666
φ Eridani	3.8	2 13 28.273	2.1412	−51 54 19.30	16.712
ο Ceti (*Mira*) †	*var.*	2 15 3.092	3.0291	− 3 21 46.70	16.436
κ Fornacis	5.4	2 18 39.156	2.7448	−24 12 8.11	16.411
δ Hydri	4.3	2 20 13.900	1.0584	−69 2 45.34	16.428
ι Cassiopeiæ . †	4.6	2 22 2.701	+4.9029	+67 1 15.85	+16.327
ξ^2 Ceti	4.3	2 23 38.244	3.1864	+ 8 4 46.74	16.229
σ Ceti	4.8	2 28 3.433	2.8415	−15 37 1.26	15.904
36 H. Cassiopeiæ	5.3	2 29 55.347	5.6383	+72 26 50.86	15.925
ν Ceti	5.0	2 31 24.676	+3.1451	+ 5 13 22.74	15.809
μ Hydri	5.3	2 33 26.416	−1.3511	−79 28 49.47	+15.680
ν Arietis	5.4	2 33 59.203	+3.4020	+21 35 39.96	15.667
δ Ceti	4.0	2 35 7.461	3.0731	− 0 2 15.01	15.631
ε Hydri	4.3	2 38 16.634	0.9138	−68 37 51.66	15.458
θ Persei	4.2	2 38 23.193	4.0833	+48 52 11.05	15.359
γ Ceti *seq.* . †	3.7	2 38 53.664	+3.1059	+ 2 52 41.43	+15.267
π Ceti	4.4	2 40 4.561	2.8537	−14 13 5.18	15.340
μ Ceti	4.4	2 40 20.674	+3.2394	+ 9 45 21.47	+15.311

ε Sculptoris, comp. 9^m, 5″ n. f.
ο Ceti, var., 331^d, $1^m.7$–$9^m.6$, star 9^m f. 8^s

ι Cassiop., triple, 7^m, 8^m, 2″, 8″

γ Ceti, comp. $6^m.2$, 2″.7 pr.

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Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
η Persei . . . †	3.9	2 44 29.228	+4.3576	+55 32 36.93	+15.089
Arietis . . .	3.7	2 44 58.582	3.5248	+26 54 39.24	14.961
Fornacis . . .	4.5	2 45 31.992	2.5121	−32 45 44.94	15.196
Arietis . . .	5.5	2 46 47.812	3.3080	+14 43 56.45	14.933
Eridani . . .	4.8	2 47 10.893	2.7200	−21 21 13.46	14.928
Persei . . .	4.1	2 48 13.337	+4.2364	+52 24 55.69	+14.880
Eridani . . .	4.0	2 52 16.469	2.9302	− 9 14 8.95	14.430
ε Arietis (*mean*) . . †	4.6	2 54 20.884	3.4254	+21 0 3.66	14.510
H. Cephei . . .	5.7	2 54 43.904	7.8484	+79 5 3.53	14.506
θ Eridani . . . †	3.4	2 55 2.411	2.2767	−40 38 41.34	14.502
Ceti . . .	2.8	2 57 50.056	+3.1332	+ 3 45 24.85	+14.230
Persei . . .	3.1	2 58 37.879	4.3280	+53 10 28.24	14.254
τ³ Eridani . . .	4.2	2 58 38.655	2.6449	−23 57 25.18	14.214
ρ Persei . . . †	*var.*	2 59 43.446	3.8353	+38 30 41.80	14.076
ι Horologii . . .	5.2	3 1 36.362	1.4077	−60 4 0.91	14.021
θ Hydri . . .	5.5	3 2 4.123	+0.1002	−72 14 3.81	+14.060
β Persei . (*Algol*) †	*var.*	3 2 37.936	3.8934	+40 37 44.41	14.009
δ Arietis . . .	4.5	3 6 45.936	3.4261	+19 24 21.70	13.751
2 Eridani . . . †	4.0	3 8 27.562	2.5467	−29 19 18.00	14.278
8 H. Cephei . . .	5.5	3 9 29.353	7.5006	+77 25 26.39	13.520
ζ Arietis . . .	5.0	3 10 0.743	+3.4436	+20 43 48.35	+13.460
8 Horologii (G.) . . †	5.7	3 10 23.763	1.5148	−57 38 22.62	13.511
ζ Eridani . . .	4.9	3 11 42.203	2.9124	− 9 8 5.10	13.486
τ Arietis . . .	5.2	3 16 19.010	3.4593	+20 50 28.80	13.097
e Eridani . . .	4.3	3 16 31.960	+2.3980	−43 23 39.34	13.873
ι Hydri . . .	5.5	3 18 3.138	−1.5535	−77 41 57.79	+13.055
α Persei . . .	1.9	3 18 14.796	+4.2690	+49 33 34.51	12.974
o Tauri . . .	3.8	3 20 14.212	3.2254	+ 8 43 49.74	12.795
2 H. Camelopardalis .	4.4	3 22 10.563	4.8372	+59 38 42.66	12.740
ξ Tauri . . .	3.8	3 22 33.631	3.2484	+ 9 26 12.97	12.666
f Tauri . . .	4.3	3 26 10.686	+3.3090	+12 38 46.18	+12.469
ε Eridani . . . †	3.8	3 28 55.491	2.8252	− 9 44 42.81	12.304
τ⁵ Eridani . . .	4.3	3 30 1.905	2.6483	−21 55 2.76	12.162
δ Persei . . .	3.1	3 36 51.984	4.2599	+47 31 0.31	11.685
δ Eridani . . .	3.7	3 39 10.548	2.8730	−10 3 2.13	12.287
ν Persei . . .	3.9	3 39 24.843	+4.0669	+42 18 39.87	+11.540
5 H. Camelopardalis .	4.7	3 41 21.890	6.2840	+71 4 17.87	11.343
η Tauri . (*Alcyone*) †	3.0	3 42 25.719	3.5616	+23 50 35.18	11.273
τ⁶ Eridani . . .	4.3	3 43 11.433	2.5806	−23 29 58.26	10.786
g Eridani . . .	4.2	3 46 16.434	+2.2451	−36 27 24.91	11.016
γ Hydri . . .	3.2	3 48 32.442	−0.9652	−74 29 58.93	+10.995
ζ Persei . . .	2.9	3 48 47.105	+3.7656	+31 37 55.55	10.846
9 H. Camelopardalis . †	5.2	3 49 52.744	5.0940	+60 51 39.62	10.762
ε Persei . . . †	3.0	3 52 8.747	4.0192	+39 45 55.06	10.585
ξ Persei . . .	4.0	3 53 26.756	3.8868	+35 32 50.68	10.498
γ Eridani . . .	3.2	3 54 3.793	+2.7984	−13 44 58.63	+10.359
λ Tauri . . . †	*var.*	3 55 58.159	3.3215	+12 15 3.56	10.315
δ Reticuli . . .	4.4	3 57 23.686	+0.9409	−61 38 22.80	+10.217

η Persei, star 8^m.5, 28″ n. pr.
ε Arietis, dup., 5^m.2, 5^m.6, 1″.2
θ Eridani, comp. 4^m.4, f. 8″
ρ Persei, var. irreg., 3^m.4–4^m.2

β Persei, var. 2^d.87, 2^m.1–3^m.2
12 Eridani, comp. 7^m, 1″.4 n. pr.
38 Horologii, remarkable purplish red star.
ε Eridani, comp. 9^m, s. 7″

η Tauri, quad., comps. 6^m.3, 7^m.6, 8^m.2, 117″, 281″, 190″
9 H. Camelop., comp. 8^m, 1″.9 n. f.
ε Persei, comp. 8^m, 8″.6 n. f.
λ Tauri, var., 3^d.95, 3^m.3–4^m.2

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variati
		h	m	s	s	°	′	″	″
ν Tauri	3.9	3	58	38.001	+ 3.1896	+ 5	45	15.28	+10.1
A Tauri †	4.5	3	59	40.052	3.5433	+21	51	1.99	9.9
c Persei	4.0	4	2	29.150	4.3471	+47	29	11.80	9.8
p Tauri	5.6	4	5	39.079	3.6492	+26	15	35.98	9.5
o^1 Eridani	4.1	4	7	42.934	2.9273	− 7	3	30.28	9.5
Groombridge 750	6.7	4	9	27.362	+17.5817	+85	19	51.71	+ 9.3
μ Tauri	4.3	4	10	55.033	3.2556	+ 8	40	49.08	9.1
α Horologii	3.8	4	11	11.097	1.9874	−42	30	13.56	8.9
α Reticuli	3.4	4	13	19.541	0.7650	−62	41	11.08	9.0
γ Tauri	3.9	4	14	57.254	3.4116	+15	25	23.64	8.8
δ Tauri	3.9	4	18	1.841	+ 3.4569	+17	20	38.52	+ 8.5
υ^5 Eridani	4.1	4	20	50.633	2.2528	−34	12	49.46	8.4
ε Tauri	3.6	4	23	39.084	+ 3.5007	+18	59	34.14	8.1
δ Mensæ	5.6	4	23	41.271	− 4.1475	−80	24	50.32	8.2
m Persei †	6.1	4	27	25.825	+ 4.2151	+42	53	0.24	7.8
α Tauri (*Aldebaran*)	1.1	4	31	2.478	+ 3.4400	+16	20	21.52	+ 7.3
ν Eridani	4.1	4	32	4.240	2.9958	− 3	31	31.42	7.5
α Doradus	3.5	4	32	9.519	1.2947	−55	13	13.84	7.4
53 Eridani	4.0	4	34	17.155	2.7455	−14	28	9.75	7.1
τ Tauri	4.3	4	37	8.495	3.5986	+22	47	41.21	7.0
Groombridge 848	6.0	4	37	22.320	+ 8.0196	+75	47	18.33	+ 6.9
α Cœli	4.5	4	37	49.265	1.9300	−42	1	33.14	6.9
4 Camelopardalis	5.4	4	40	55.036	4.9866	+56	36	27.09	6.6
μ Eridani	4.2	4	41	15.094	2.9988	− 3	24	34.58	6.7
π^3 Orionis	3.3	4	45	13.471	3.2551	+ 6	48	49.86	6.4
9 Camelopardalis	4.4	4	45	35.540	+ 5.9481	+66	11	59.49	+ 6.399
i Tauri	5.1	4	46	23.995	3.5076	+18	41	46.04	6.2
π^5 Orionis	3.9	4	49	49.380	3.1240	+ 2	18	8.72	6.047
ι Aurigæ	2.9	4	51	27.348	3.9038	+33	1	57.14	5.885
β Camelopardalis	4.2	4	55	51.023	5.3257	+60	19	10.05	5.52
ε Aurigæ †	*var.*	4	55	52.017	+ 4.3012	+43	41	55.08	+ 5.52
ζ Aurigæ	3.9	4	56	32.023	4.1895	+40	57	10.53	5.49
ι Tauri	4.7	4	58	0.837	3.5847	+21	28	9.83	5.307
11 Orionis	4.6	4	59	42.650	3.4266	+15	17	11.96	5.177
η Aurigæ	3.3	5	0	33.117	4.2041	+41	7	14.19	5.070
ε Leporis	3.3	5	1	51.735	+ 2.5384	−22	29	4.16	+ 4.967
β Eridani	2.9	5	3	40.249	2.9492	− 5	11	43.62	4.803
μ Aurigæ	4.8	5	7	36.538	4.1017	+38	23	5.59	4.463
19 H. Camelopardalis	5.2	5	8	31.512	9.8334	+79	8	10.01	4.620
μ Leporis	3.3	5	9	6.773	2.6940	−16	18	19.23	4.386
α Aurigæ (*Capella*)	0.2	5	10	24.448	+ 4.4287	+45	54	45.93	+ 3.875
β Orionis (*Rigel*) †	0.3	5	10	27.127	2.8823	− 8	17	56.44	4.300
λ Aurigæ	4.8	5	13	9.585	4.2176	+40	1	28.81	3.409
τ Orionis	3.7	5	13	28.726	2.9125	− 6	56	7.54	4.036
o Columbæ	4.9	5	14	24.975	2.1588	−34	58	40.56	3.609
γ Orionis (*Bellatrix*)	1.7	5	20	34.277	+ 3.2170	+ 6	16	24.75	+ 3.415
β Tauri	1.8	5	20	55.053	3.7913	+28	32	12.08	3.225
17 Camelopardalis	5.8	5	22	8.323	+ 5.6597	+62	59	51.64	+ 3.289

A Tauri, star $6^m.5$ f. 38^s, 270″ s.
m Persei, star 6^m, 115″ s. pr.

ε Aurigæ, var. irreg., $3^m.0$–$4^m.5$.

β Orionis, comp. $8^m.0$, 9″.5 s. pr.

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
Leporis	3.0	5	24	36.199	+ 2.5703	−20	49	35.17	+2.995
Aurigæ	4.9	5	27	11.663	3.9039	+32	7	48.64	2.846
Orionis †	2.5	5	27	39.809	3.0643	− 0	21	40.31	2.816
Groombridge 966	6.4	5	28	21.045	8.0088	+74	59	22.90	2.776
Leporis	2.7	5	28	58.865	2.6457	−17	52	56.65	2.704
Orionis	4.5	5	30	9.193	+ 3.2926	+ 9	25	58.17	+2.588
Orionis †	2.9	5	31	16.491	2.9342	− 5	57	53.66	2.504
Orionis	1.8	5	31	53.988	3.0435	− 1	15	19.10	2.453
Tauri	3.0	5	32	33.850	3.5849	+21	5	29.69	2.362
Groombridge 944	6.4	5	34	35.250	18.7618	+85	9	25.87	2.214
Orionis †	2.0	5	36	28.173	+ 3.0270	− 1	59	12.54	+2.041
Columbæ	2.8	5	36	34.264	2.1725	−34	7	8.00	2.007
Aurigæ	5.5	5	39	18.817	4.6452	+49	47	24.84	1.788
Leporis	3.7	5	43	6.208	2.7179	−14	51	10.26	1.476
Orionis	2.2	5	43	43.496	2.8449	− 9	41	56.49	1.419
Doradus	4.5	5	44	37.108	+ 0.1021	−65	46	2.69	+1.344
Aurigæ	4.2	5	45	35.884	+ 4.1573	+39	7	29.15	1.272
Mensæ (G.)	6.2	5	46	38.12*	−11.6858	−84	49	49.43	1.255
Leporis	3.9	5	47	39.924	+ 2.5796	−20	53	7.97	0.429
Orionis (*Betelgeux*) †	*var.*	5	50	34.187	3.2479	+ 7	23	31.66	0.834
Aurigæ	3.9	5	52	31.753	+ 4.9418	+54	16	46.62	+0.535
η Leporis	3.8	5	52	31.996	2.7323	−14	10	56.85	0.794
β Aurigæ	2.1	5	53	17.660	4.4018	+44	56	24.07	0.580
θ Aurigæ †	2.7	5	53	55.502	4.0916	+37	12	27.69	+0.441
1 Geminorum	4.3	5	58	57.210	3.6475	+23	16	7.88	−0.017
1 Puppis (G.) †	6.2	6	2	1.631	+ 1.7258	−45	2	9.90	+0.047
ν Orionis	4.4	6	2	43.158	3.4264	+14	46	46.33	−0.263
2 H. Camelopardalis	4.7	6	9	28.988	6.6184	+69	21	5.37	0.943
η Geminorum †	*var.*	6	9	44.853	3.6227	+22	31	56.66	0.869
2 Lyncis	4.4	6	12	7.607	5.2985	+59	2	35.59	1.030
ζ Canis Majoris	3.1	6	17	2.925	+ 2.3018	−30	1	30.99	−1.513
μ Geminorum	3.2	6	17	49.125	3.6307	+22	33	29.65	1.671
ψ^1 Aurigæ	5.1	6	18	21.286	4.6260	+49	19	57.25	1.607
β Canis Majoris	2.0	6	18	57.372	2.6416	−17	54	46.37	1.652
8 Monocerotis †	4.5	6	19	15.865	3.1802	+ 4	38	12.90	1.674
α Argûs (*Canopus*)	−0.9	6	22	3.901	+ 1.3319	−52	38	56.20	−1.918
10 Monocerotis	5.0	6	23	45.790	2.9641	− 4	42	31.38	2.068
ν Geminorum	4.1	6	23	54.979	3.5629	+20	16	0.97	2.104
8 Lyncis	6.0	6	29	55.621	5.4921	+61	33	26.63	2.886
ξ^1 Canis Majoris	4.5	6	31	29.654	2.5157	−22	53	46.43	2.711
23 H. Camelopardalis	5.6	6	31	44.976	+10.2989	+79	39	32.76	−3.401
51 Aurigæ	5.7	6	32	46.215	4.1597	+39	28	0.74	2.969
γ Geminorum	1.9	6	32	48.129	3.4670	+16	28	21.89	2.907
ν Argûs	3.2	6	35	9.709	1.8367	−43	7	15.40	3.082
S Monocerotis †	4.7	6	36	17.836	3.3047	+ 9	58	30.86	3.170
ε Geminorum	3.2	6	38	42.204	+ 3.6928	+25	12	58.74	−3.387
ξ Geminorum	3.4	6	40	31.160	3.3684	+12	59	17.48	3.718
ψ^5 Aurigæ	5.3	6	40	36.961	+ 4.3298	+43	39	47.46	−3.374

δ Orionis, star $6^m.9$, 52″.6 n.
Orionis, comp. $7^m.3$, 11″.5 s. f.
ζ Orionis, comp. $4^m.2$, 2″.4 s. f.

α Orionis, red star, var. irreg. $1^m.0$–$1^m.4$.
θ Aurigæ, comp. $7^m.5$, 2″.5, n. pr.
1 Puppis, star, $5^m.8$, 150″ s. f.

η Gem., var. $231^d.4$, $3^m.2$–$4^m.2$, comp. $8^m.8$, 1″.2 n. pr.
8 Monoc., star $6^m.5$, 13″.7 n. f.
S Monoc., comp. $8^m.8$, 2″.9 s. pr.

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			An Varia
		h	m	s	s	°	′	″	
α Canis Majoris (*Sirius*) †	−1.6	6	41	24.147	+ 2.6434	−16	35	55.77	− 4
18 Monocerotis	4.7	6	43	25.707	3.1281	+ 2	30	21.80	3
43 Camelopardalis	5.1	6	44	32.874	+ 6.4884	+68	59	19.96	3
ζ Mensæ	5.6	6	47	8.432	− 4.9417	−80	43	30.15	4
θ Geminorum	3.6	6	47	11.329	+ 3.9582	+34	3	53.33	4
α Pictoris	3.3	6	47	19.240	+ 0.6176	−61	51	0.16	− 3
τ Argûs	2.8	6	47	49.608	1.4883	−50	30	47.80	4
15 Lyncis †	4.5	6	49	55.390	5.2069	+58	32	8.08	4
θ Canis Majoris	4.2	6	50	14.472	2.7879	−11	55	52.50	4
ε Canis Majoris †	1.6	6	55	17.102	2.3574	−28	51	20.52	4
ζ Geminorum †	*var.*	6	59	4.127	+ 3.5606	+20	41	45.29	− 5
o² Canis Majoris	3.1	6	59	28.510	2.5048	−23	42	30.00	5
γ Canis Majoris	4.1	6	59	54.790	2.7148	−15	30	24.90	5
51 H. Cephei	5.3	7	1	5.64*	29.2318	+87	11	5.45	5
δ Canis Majoris	2.0	7	4	56.055	2.4381	−26	15	27.17	5
63 Aurigæ	5.1	7	5	48.725	+ 4.1329	+39	27	37.06	− 5
51 Geminorum	5.3	7	8	29.521	+ 3.4480	+16	18	14.88	5
γ² Volantis †	3.9	7	9	28.283	− 0.5012	−70	21	39.88	5
λ Geminorum	3.6	7	13	12.571	+ 3.4502	+16	41	40.50	6
25 H. Camelopardalis	5.1	7	13	16.654	12.8254	+82	34	42.85	6
π Argûs	2.7	7	14	8.442	+ 2.1189	−36	56	40.18	− 6
δ Geminorum †	3.5	7	15	2.913	+ 3.5865	+22	8	23.28	6
δ Volantis	4.0	7	16	52.998	− 0.0194	−67	48	6.13	6
7 Octantis (G.)	6.4	7	17	0.79*	−20.2238	−86	53	53.55	6
ι Geminorum	3.9	7	20	26.978	+ 3.7304	+27	58	4.77	6
η Canis Majoris	2.4	7	20	44.023	+ 2.3738	−29	8	11.78	− 6
Groombridge 1308	5.8	7	22	2.963	6.2749	+68	38	27.05	7
β Canis Minoris	3.1	7	22	32.538	3.2554	+ 8	27	41.16	7
ρ Geminorum	4.2	7	23	38.789	3.8631	+31	57	16.89	6
σ Argûs †	3.3	7	26	31.996	1.9016	−43	7	43.66	7
α² Geminorum (*Castor*)	2.0	7	29	10.736	+ 3.8332	+32	4	34.45	− 7
α¹ Geminorum	2.8	$\Delta\alpha$ − 0.264			. . . .	$\Delta\delta$ − 4.13			. .
25 Monocerotis	5.2	7	33	3.100	2.9819	− 3	55	13.16	7
α Can. Min. (*Procyon*) †	0.5	7	34	51.192	3.1421	+ 5	26	36.57	9
24 Lyncis	5.0	7	35	49.392	5.0937	+58	54	37.89	8
κ Geminorum †	3.7	7	39	19.122	+ 3.6265	+24	36	9.66	− 8
β Geminorum (*Pollux*)	1.2	7	40	7.018	3.6758	+28	13	56.71	8
4 Puppis	5.1	7	42	2.035	2.7636	−14	21	23.32	8
ξ Argûs	3.5	7	45	43.165	2.5232	−24	38	44.72	8
φ Geminorum	5.0	7	48	17.882	3.6766	+26	59	12.46	9
26 Lyncis	5.7	7	48	31.771	+ 4.3814	+47	47	9.69	− 9.1
Groombridge 1374	5.6	7	50	2.805	7.2441	+74	8	48.11	9.2
χ Argûs	3.6	7	54	37.092	1.5259	−52	45	14.71	9.6
ω Cancri	5.9	7	55	47.407	3.6339	+25	37	34.86	9.7
χ Geminorum	5.0	7	58	18.059	3.6903	+28	2	0.52	9.9
27 Lyncis	4.9	8	2	4.338	+ 4.5299	+51	45	10.18	−10.1
ρ Argûs	2.9	8	3	55.427	2.5546	−24	3	30.65	10.2
3 H. Ursæ Majoris	5.5	8	4	22.221	+ 6.0120	+68	43	32.57	−10.3

15 Lyncis, dup., $4^{m}.9$, $6^{m}.2$, $0''.7$
ε Can. Maj., comp. 9^{m}, $7''.8$ s. f.
ζ Gem., var., $10^{d}.15$, $3^{m}.7$–$4^{m}.3$

γ² Volantis, comp. $5^{m}.8$, $12''.9$ n. pr.
δ Gem., comp. 8^{m}, $7''.0$ s. pr.

σ Argûs, star. 8^{m}, $22''.4$ n. f.
κ Gem., comp. $8^{m}.5$, $6''.6$ s. pr.

Positions given for Sirius and Procyon are those of the centers of their orbits. Corrections given on page i
main to be applied to reduce to the positions of the stars.

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
Argûs . . . †	2.2	8	6	54.847	+ 1.8498	−47	5	8.66	−10.553
Cancri (*mean*) . . †	4.7	8	7	20.353	3.4445	+17	54	18.16	10.702
Bradley 1147 . .	5.7	8	8	53.844	7.6207	+76	1	4.57	10.696
Puppis . . .	5.0	8	9	25.556	2.7580	−15	31	53.12	10.727
Cancri . . .	3.8	8	11	54.404	3.2557	+ 9	26	53.87	10.963
Groombridge 1119 .	7.0	8	13	47.916	+60.5580	+88	53	22.50	−11.032
Lyncis . . .	4.4	8	17	1.414	4.1209	+43	27	42.48	11.383
Cancri . . .	5.9	8	18	29.938	3.4391	+18	36	21.16	11.421
Argûs . . .	1.7	8	20	46.247	1.2338	−59	14	8.47	11.545
Monocerotis . .	4.0	8	21	24.869	+ 2.9996	− 3	37	42.18	11.618
Chamæleontis . .	4.3	8	23	12.619	− 1.7472	−77	12	38.80	−11.709
Ursæ Majoris . .	3.5	8	23	12.908	+ 5.0122	+61	0	12.47	11.839
Groombridge 1450 .	6.0	8	27	23.718	3.9092	+38	18	31.60	12.200
Cancri . . .	5.5	8	27	47.760	3.4744	+20	43	50.34	12.105
Groombridge 1446 .	6.3	8	30	17.206	6.7448	+73	55	41.20	12.340
Hydræ . . .	4.2	8	33	9.464	+ 3.1781	+ 6	0	3.19	−12.435
Hydræ . . .	4.5	8	34	18.967	3.1383	+ 3	38	26.23	12.513
Cancri . . .	4.7	8	38	22.201	3.4769	+21	46	29.82	12.818
Cancri . . .	4.2	8	39	51.429	3.4138	+18	28	2.70	13.115
Pyxidis . . .	3.7	8	40	10.562	2.4110	−32	52	45.90	12.886
Cancri . . . †	4.2	8	41	33.460	+ 3.6379	+29	4	17.68	−13.040
Hydræ . . . †	3.5	8	42	16.581	3.1797	+ 6	43	53.13	13.085
Argûs . . . †	2.0	8	42	21.198	1.6517	−54	23	48.19	13.142
Cancri (*mean*) . . †	5.5	8	49	3.755	3.6680	+30	54	7.52	13.503
Hydræ . . .	3.3	8	50	54.154	3.1744	+ 6	16	11.00	13.594
ι Ursæ Majoris . .	3.1	8	53	23.714	+ 4.1227	+48	22	34.26	−14.009
Cancri . . .	4.3	8	53	50.424	3.2846	+12	11	14.60	13.830
b¹ Carinæ . . . †	5.1	8	54	53.563	1.4681	−58	54	3.91	13.874
κ Ursæ Majoris . .	3.7	8	57	49.777	4.1107	+47	29	36.53	14.106
σ² Ursæ Majoris . . †	4.9	9	2	56.001	5.3221	+67	28	50.38	14.421
κ Cancri . . .	5.1	9	3	8.719	+ 3.2527	+11	0	39.25	−14.380
λ Argûs . . .	2.2	9	4	52.138	+ 2.2062	−43	5	20.84	14.479
ζ Octantis . . .	5.4	9	9	14.21*	− 8.1212	−85	19	28.08	14.691
θ Hydræ . . .	3.8	9	9	56.613	+ 3.1236	+ 2	40	24.73	15.088
β Argûs . . .	1.8	9	12	16.325	0.6699	−69	22	1.19	14.819
Cancri . . .	6.6	9	14	14.425	+ 3.3536	+18	3	58.66	−15.164
ι Argûs . . .	2.2	9	14	48.782	1.6040	−58	55	5.45	15.054
Lyncis . . .	3.3	9	15	52.878	3.6635	+34	45	9.62	15.109
θ Pyxidis . . .	4.9	9	17	43.581	2.6514	−25	36	12.89	15.259
α Hydræ . . .	2.2	9	23	24.653	2.9487	− 8	17	22.41	15.513
h Ursæ Majoris . .	3.8	9	24	50.659	+ 4.7652	+63	26	3.55	−15.600
1 H. Draconis . .	4.6	9	25	4.133	8.8008	+81	42	12.85	15.664
d Ursæ Majoris . .	4.6	9	26	59.460	5.3602	+70	12	17.40	15.671
θ Ursæ Majoris . .	3.3	9	27	10.855	4.0304	+52	3	55.70	16.295
ψ Argûs . . . †	3.6	9	27	20.963	2.3594	−40	5	40.03	15.723
ξ Leonis . . .	5.1	9	27	21.973	+ 3.2369	+11	40	36.59	−15.845
10 Leonis Minoris . .	4.6	9	29	1.282	+ 3.6851	+36	46	32.30	15.872
Chamæleontis . .	5.2	9	36	25.656	− 1.6513	−80	33	34.39	−16.220

γ Argûs, star 5^{m}, 42″.5 s. pr.
ζ Cancri, triple; binary 5^{m}.6, 6^{m}.3, 1″ with comp. 6^{m}.0, 5″.4 s. f.
ι Cancri, star 6^{m}.6, 30″.6 n. pr.

ε Hydræ, triple; binary 3^{m}.5 6^{m}.8, 0″.2, with comp. 7^{m}.8, 3″.3.
δ Argûs, comp. 5^{m}, 2″ s.
σ² Cancri, dup. 5^{m}.9, 6^{m}.4, 1″.4

b¹ Carinæ, comp. 7^{m}.2, 5^{s} f.
σ² Urs. Maj., binary 4^{m}.9, 8^{m}, 1″.3
ψ Argûs, dup. 3^{m}.8, 6^{m}.0, 0″.8

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annu Variat
		h	m	s	s	°	′	″	″
ο Leonis	3.8	9	36	36.960	+3.2050	+10	16	46.82	−16.
θ Antliæ	5.0	9	40	24.734	2.6731	−27	22	47.43	16.
ε Leonis	3.1	9	41	1.771	3.4110	+24	9	58.02	16.
υ Ursæ Majoris	3.9	9	44	57.451	4.2921	+59	26	21.17	16.
υ Argûs †	3.2	9	44	58.688	1.5008	−64	40	39.35	16.
6 Sextantis	6.0	9	46	57.087	+3.0245	− 3	50	40.00	−16.7
μ Leonis	4.1	9	47	55.921	3.4171	+26	24	28.24	16.8
Groombridge 1586	6.0	9	50	48.739	5.4305	+73	17	3.77	17.0
19 Leonis Minoris	5.2	9	52	29.029	3.6850	+41	27	39.74	17.0
φ Argûs	3.7	9	53	52.556	2.1016	−54	9	46.90	17.1
π Leonis	4.9	9	55	43.375	+3.1722	+ 8	27	9.09	−17.
η Leonis	3.6	10	2	41.951	3.2727	+17	10	39.51	17.4
α Leonis (*Regulus*)	1.3	10	3	50.825	3.1982	+12	22	59.05	17.5
λ Hydræ	3.8	10	6	26.654	2.9247	−11	56	0.44	17.7
q Velorum	4.1	10	11	9.860	2.5129	−41	42	1.69	17.7
32 Ursæ Majoris	5.7	10	11	52.653	+4.3934	+65	31	58.59	−17.
ζ Leonis	3.6	10	11	57.954	3.3422	+23	50	28.88	17.
λ Ursæ Majoris	3.5	10	11	58.636	3.6311	+43	20	21.76	17.
γ Leonis *pr.* †	2.6	10	15	17.315	3.3116	+20	16	18.99	18.
μ Ursæ Majoris	3.2	10	17	16.275	3.5859	+41	55	38.82	18.
30 H. Ursæ Majoris	4.9	10	18	1.440	+4.3620	+65	59	48.46	−18.1
30 H. Camelopardalis	5.3	10	20	49.679	7.5850	+82	59	30.46	18.
μ Hydræ	4.1	10	21	58.735	2.9005	−16	24	7.03	18.
31 Leonis Minoris	4.4	10	22	58.420	3.4791	+37	8	35.19	18.
α Antliæ	4.4	10	23	15.630	2.7424	−30	38	5.93	18.
36 Ursæ Majoris	4.8	10	25	11.852	+3.8608	+56	25	0.55	−18.3
9 H. Draconis	5.0	10	27	54.385	5.1845	+76	9	4.96	18.4
ρ Leonis	3.8	10	28	20.236	3.1616	+ 9	44	39.87	18.
33 Sextantis	6.4	10	37	4.733	3.0519	− 1	17	39.07	18.8
41 Leonis Minoris	5.0	10	38	47.842	3.2671	+23	38	1.50	18.7
θ Argûs	3.0	10	39	55.223	+2.1324	−63	56	57.98	−18.8
42 Leonis Minoris	5.4	10	41	8.529	3.3425	+31	7	49.16	18.9
η Argûs †	*var.*	10	41	45.592	2.3208	−59	14	14.78	18.8
μ Argûs †	2.8	10	43	6.611	2.5736	−48	58	15.91	19.0
l Leonis	5.3	10	44	47.473	3.1564	+10	59	42.68	19.0
δ^2 Chamæleontis †	4.6	10	44	59.830	+0.5941	−80	5	30.67	−18.9
ν Hydræ	3.3	10	45	25.774	2.9582	−15	44	54.10	18.7
46 Leonis Minoris	3.9	10	48	33.747	3.3635	+34	40	24.43	19.3
54 Leonis †	4.5	10	51	0.813	3.2530	+25	12	12.25	19.1
ι Antliæ	4.7	10	52	45.515	2.7960	−36	40	50.23	19.3
Groombridge 1706	6.3	10	53	11.477	+4.8888	+78	13	33.02	−19.2
α Crateris	4.2	10	55	37.895	2.9206	−17	50	45.95	19.1
d Leonis	5.0	10	56	10.282	3.0992	+ 4	4	26.68	19.2
β Ursæ Majoris	2.4	10	56	43.315	3.6407	+56	50	17.88	19.2
α Ursæ Majoris	2.0	10	58	29.677	+3.7286	+62	12	36.50	19.39
η Octantis	6.3	10	59	56.00*	−0.3564	−84	8	11.87	−19.3
χ Leonis	4.7	11	0	38.013	+3.0961	+ 7	47	45.22	19.4
p^4 Leonis	5.7	11	2	34.123	+3.0613	+ 2	25	2.26	−19.5

υ Argûs, comp. 6^m.0, 4″.9 s. f.
γ Leonis, comp. 3^m.8, 3″.7 s. f.

η Argûs, var., irreg., 1^m.6–6^m.6
μ Argûs, comp. 7^m, 2″.2 n. f.

δ^2 Cham., star 5^m.5 pr. 32^s, 256″ n.
54 Leonis, comp. 6^m.3, 6″.4 s. f.

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Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
Ursæ Majoris . .	3.2	11 4 53.468	+3.3851	+44 57 35.81	−19.502
Crateris . . .	4.5	11 7 28.530	2.9476	−22 21 42.15	19.628
Leonis . . .	2.6	11 9 35.433	3.1952	+20 59 22.42	19.703
Leonis . . .	3.4	11 9 46.859	3.1505	+15 53 39.62	19.651
Ursæ Majoris . .	3.7	11 13 53.502	3.2480	+33 33 29.97	19.615
Crateris . . .	3.8	11 15 5.381	+2.9974	−14 19 6.26	−19.467
Leonis . . .	4.1	11 16 45.270	3.0950	+ 6 29 43.50	19.702
Centauri . . .	4.3	11 17 7.546	2.7260	−54 1 30.24	19.709
Leonis . . . †	4.0	11 19 29.634	3.1286	+10 59 51.30	19.817
Leonis . . .	5.2	11 23 33.984	3.0858	+ 3 19 28.29	19.809
Draconis . . .	4.1	11 26 22.439	+3.5964	+69 48 1.25	−19.851
Hydræ . . .	3.7	11 28 49.112	2.9462	−31 23 14.19	19.915
Centauri . . .	3.3	11 31 51.141	2.7502	−62 32 58.03	19.921
Leonis . . .	4.5	11 32 35.798	3.0716	− 0 21 15.61	19.863
Chamæleontis . .	5.7	11 33 44.826	2.4529	−75 25 33.58	19.937
Draconis . . .	5.5	11 37 44.648	+3.3731	+67 12 55.43	−19.916
Crateris . . .	4.9	11 40 27.154	3.0376	−17 52 41.26	20.014
Ursæ Majoris . .	3.8	11 41 34.089	3.1801	+48 15 2.66	19.961
Leonis (*Denebola*)	2.2	11 44 43.528	3.0624	+15 2 50.16	20.119
Virginis . . .	3.8	11 46 16.060	3.1252	+ 2 14 37.73	20.284
Groombridge 1830 .	6.5	11 48 5.075	+3.4677	+38 19 43.70	−25.802
Ursæ Majoris . .	2.5	11 49 22.014	3.1700	+54 10 2.51	20.020
Virginis . . .	4.6	11 56 31.032	3.0742	+ 7 5 17.87	20.075
Virginis . . .	4.2	12 0 52.794	3.0570	+ 9 12 17.97	20.013
Centauri . . .	2.9	12 3 56.796	3.0952	−50 14 57.05	20.072
ε Corvi . . .	3.2	12 5 45.044	+3.0812	−22 8 49.52	−20.037
4 H. Draconis . .	5.1	12 8 13.957	2.8477	+78 5 18.74	20.013
δ Crucis . . .	3.1	12 10 37.713	3.1749	−58 16 35.20	20.062
δ Ursæ Majoris . .	3.4	12 11 13.649	2.9848	+57 30 17.54	20.016
γ Corvi . . .	2.8	12 11 25.941	3.0817	−17 4 11.83	20.004
2 Canum Venaticorum . †	5.8	12 11 52.324	+3.0160	+41 7 59.40	−20.065
β Chamæleontis . .	4.4	12 13 19.926	3.4477	−78 50 24.94	19.995
Bradley 1672 . .	6.3	12 14 27.688	0.3615	+88 10 15.98	19.947
η Virginis . . .	4.0	12 15 33.429	3.0693	− 0 11 40.25	20.027
α¹ Crucis . . .	1.6	12 21 51.556	3.3121	−62 37 41.44	19.994
α² Crucis . . .	2.1	Δα + 0.614	. . . .	Δδ − 1.28	. . . .
10 Comæ . . .	5.7	12 25 27.180	+3.0183	+21 22 0.10	−19.958
δ Corvi . . . †	3.1	12 25 27.862	3.1012	−16 2 32.34	20.070
γ Crucis . . . †	1.6	12 26 26.420	3.3035	−56 38 13.90	20.173
8 Canum Venaticorum .	4.3	12 29 42.626	2.8564	+41 49 9.01	19.598
κ Draconis . . .	3.9	12 29 51.770	+2.5776	+70 15 23.98	−19.866
β Corvi . . .	2.8	12 29 55.114	3.1454	−22 55 36.53	19.936
24 Comæ *seq.* . . †	5.2	12 30 52.010	3.0107	+18 50 41.21	19.851
α Muscæ . . .	2.9	12 32 5.988	3.5415	−68 40 2.42	19.878
χ Virginis . . .	4.8	12 34 51.448	3.0937	− 7 31 40.65	19.845
γ Centauri . . . †	2.4	12 36 49.362	+3.2946	−48 29 35.47	−19.807
γ Virginis (*mean*) . †	2.9	12 37 21.210	3.0398	− 0 59 0.07	19.776
ρ Virginis . . .	5.0	12 37 34.974	+3.0372	+10 42 13.65	−19.883

ι Leonis, comp. $6^m.8$, 2″.6 n. f.
2 Can. Ven., star 8^m, 11″.6 s. pr.
δ Corvi, star 8^m, 24″.4 s. pr.

γ Crucis, star $6^m.6$, 85″ n. f.
24 Comæ, star $6^m.7$, 20″.6 pr.
γ Cent., dup., $3^m.1$, $3^m.1$, 1″.7

γ Virginis, binary, $3^m.7$, $3^m.7$, 6″.2, P=328°

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annua Variati
		h	m	s	s	°	′	″	″
76 Ursæ Majoris . .	5.9	12	37	51.390	+2.6314	+63	10	46.47	−19.7
β Crucis . . .	1.5	12	42	44.680	3.4823	−59	13	27.68	19.7
ι Octantis . . .	5.4	12	45	55.22*	5.9557	−84	39	43.10	19.6
31 Comæ . . .	5.1	12	47	33.559	2.9240	+28	0	10.80	19.6
32 H. Camelop. *seq.* . †	5.3	12	48	29.536	0.4388	+83	52	29.63	19.5
n Centauri . . .	4.3	12	48	43.435	+3.3128	−39	43	0.51	−19.6
ε Ursæ Majoris (*Alioth*)	1.7	12	50	17.640	2.6482	+56	25	15.62	19.5
δ Virginis . . .	3.7	12	51	19.267	3.0208	+ 3	51	33.00	19.6
α Canum Venat. *seq.* . †	2.9	12	52	3.235	2.8106	+38	46	37.95	19.4
δ Muscæ . . .	3.6	12	56	24.108	4.0726	−71	5	26.22	19.4
ε Virginis . . .	3.0	12	57	56.741	+2.9865	+11	24	56.75	−19.3
θ Virginis . . . †	4.4	13	5	32.829	3.1032	− 5	5	7.72	19.2
43 Comæ . . .	4.3	13	7	54.514	2.8025	+28	18	31.63	18.2
20 Canum Venaticorum .	4.7	13	13	44.057	2.6956	+41	1	11.61	19.0
γ Hydræ . . .	3.3	13	14	17.827	3.2555	−22	43	24.10	19.0
ι Centauri . . .	2.9	13	15	48.741	+3.3616	−36	15	51.30	−19.0
ζ¹ Ursæ Maj.. (*Mizar*) †	2.4	13	20	30.405	2.4221	+55	22	8.38	18.8
ζ² Ursæ Majoris . .	4.0	Δα +·0.959			. . . .	Δδ − 12.70			. . .
α Virginis . (*Spica*)	1.2	13	20	42.776	3.1570	−10	43	4.50	18.8
Groombridge 2001 .	6.1	13	23	57.867	1.5243	+72	49	57.36	18.7
70 Virginis . . .	5.2	13	24	16.359	+2.9340	+14	13	56.80	−19.3
κ Octantis . . .	5.6	13	26	56.42*	9.0822	−85	21	4.95	18.6
ζ Virginis . . .	3.4	13	30	21.625	3.0545	− 0	9	41.83	18.4
17 H. Canum Venaticorum	5.0	13	31	0.209	2.6817	+37	37	3.52	18.4
ε Centauri . . .	2.6	13	34	29.567	3.7802	−53	2	5.10	18.4
m Virginis . . .	5.2	13	37	8.910	+3.1452	− 8	16	28.09	−18.2
τ Boötis . . .	4.5	13	43	13.369	2.8508	+17	52	47.83	18.0
η Ursæ Majoris (*Alkaid*)	1.9	13	44	11.605	2.3680	+49	44	13.63	18.0
89 Virginis . . .	5.1	13	45	14.978	3.2541	−17	42	40.10	18.0
ζ Centauri . . .	3.1	13	50	13.771	3.7256	−46	52	13.73	17.8
η Boötis . . .	2.8	13	50	38.254	+2.8567	+18	49	24.20	−18.11
θ Apodis . . . †	*var.*	13	57	0.213	5.7399	−76	23	13.79	17.5
τ Virginis . . .	4.3	13	57	19.165	3.0513	+ 1	57	19.56	17.5
11 Boötis . . .	6.1	13	57	19.286	2.7215	+27	47	47.97	17.4
β Centauri . . .	0.9	13	57	48.819	4.2058	−59	57	48.55	17.4
π Hydræ . . .	3.5	14	1	31.624	+3.4094	−26	16	24.30	−17.4
θ Centauri . . .	2.3	14	1	40.478	3.5196	−35	57	8.22	17.81
α Draconis . . .	3.6	14	2	5.304	1.6244	+64	46	54.53	17.2
d Boötis . . .	4.8	14	6	31.390	2.7370	+25	29	37.59	17.14
κ Virginis . . .	4.3	14	8	21.561	+3.1968	− 9	52	42.89	16.8
4 Ursæ Minoris . .	5.0	14	9	9.611	−0.2816	+77	56	48.72	−16.9
ι Virginis . . .	4.2	14	11	33.307	+3.1424	− 5	35	43.30	17.26
α Boötis (*Arcturus*)	0.2	14	11	47.030	2.7355	+19	37	28.04	18.82
λ Boötis . . .	4.3	14	13	9.239	2.2831	+46	28	41.47	16.60
δ Octantis . . .	4.1	14	13	9.28*	9.2466	−83	16	47.50	16.77
λ Virginis . . .	4.6	14	14	30.430	+3.2408	−12	58	49.37	−16.0
2 Libræ . . .	6.3	14	18	51.030	3.2237	−11	19	34.81	16.54
θ Boötis . . .	4.1	14	22	18.243	+2.0433	+52	14	35.61	−16.70

32 H. Cam., star $5^{m}.8$, 21″.6 n. pr.
α Can. Ven., star 5^{m}, 19″.8 s. pr.

θ Virginis, comp. 9^{m}, 7″.1 n. pr.
ζ¹ Urs. Maj., star Alcor $4^{m}.0$, f. $79^{s}.2$ 222″ n.

θ Apodis, var. irreg., $5^{m}.5$–$6^{m}.6$

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
f Boötis . . .	5.4	14	22	30.123	+ 2.7901	+19	36	30.67	−16.279
φ Virginis . . . †	5.0	14	23	49.280	+ 3.0889	− 1	50	50.69	16.230
5 Ursæ Minoris . .	4.4	14	27	41.302	− 0.1627	+76	4	26.15	16.004
ρ Boötis . . .	3.8	14	28	10.035	+ 2.5865	+30	44	38.50	15.887
γ Boötis . . .	3.0	14	28	39.366	2.4172	+38	40	46.56	15.829
η Centauri . . .	2.6	14	30	6.229	+ 3.7969	−41	47	6.06	−15.929
σ Boötis . . .	4.5	14	30	58.810	2.6131	+30	6	50.05	15.726
α Centauri . . . †	0.1	14	33	48.941	4.0547	−60	29	6.76	14.974
3 Boötis . . .	5.4	14	35	40.501	2.2342	+44	46	14.81	15.640
α Apodis . . .	3.8	14	37	14.370	7.2950	−78	41	6.42	15.534
μ Virginis . . .	4.0	14	38	34.732	+ 3.1586	− 5	17	21.29	−15.758
ε Boötis . . . †	2.7	14	41	16.494	2.6203	+27	25	55.12	15.275
109 Virginis . . .	3.8	14	41	57.024	3.0312	+ 2	15	1.72	15.280
8 Libræ . . .	5.3	14	45	58.934	3.3132	−15	38	39.87	15.088
α Libræ . . .	2.9	14	46	10.380	3.3138	−15	41	21.05	15.080
Groombridge 2164 .	5.7	14	49	16.884	+ 1.5202	+59	38	20.62	−14.704
β Ursæ Minoris . .	2.2	14	50	56.467	− 0.2046	+74	30	10.25	14.721
ξ² Libræ . . .	5.6	14	52	9.179	+ 3.2505	−11	4	2.22	14.652
Piazzi 221 . .	5.8	14	52	12.434	2.8297	+14	47	21.14	14.659
β Lupi . . .	2.8	14	52	57.352	3.9131	−42	47	32.73	14.666
δ Libræ . . . †	*var.*	14	56	25.691	+ 3.2013	− 8	10	56.32	−14.409
β Boötis . . .	3.6	14	58	44.662	2.2600	+40	43	31.03	14.292
γ Scorpii . . .	3.4	14	59	5.502	3.5048	−24	56	54.64	14.278
ψ Boötis . . .	4.7	15	0	48.194	2.5703	+27	16	42.50	14.138
c Boötis . . .	5.0	15	3	34.057	+ 2.6347	+25	11	58.37	14.136
Groombridge 2283 .	7.2	15	4	20.10*	−19.5312	+87	33	38.31	−13.873
ζ Lupi . . .	3.5	15	6	10.234	+ 4.2917	−51	46	34.94	13.853
ι Libræ . . .	4.7	15	7	22.364	3.4142	−19	28	15.06	13.764
γ Trianguli Australis .	3.1	15	10	57.253	5.5527	−68	22	0.14	13.523
3 Serpentis . .	5.4	15	10	57.747	2.9800	+ 5	15	15.36	13.485
δ Boötis . . .	3.5	15	12	4.567	+ 2.4193	+33	37	52.65	−13.533
β Libræ . . .	2.7	15	12	25.843	+ 3.2248	− 9	4	11.92	13.409
γ Ursæ Minoris . .	3.1	15	20	51.290	− 0.1157	+72	8	11.12	12.815
μ Boötis *pr.* . . †	4.5	15	21	16.763	+ 2.2664	+37	40	28.94	12.718
τ¹ Serpentis . .	5.5	15	21	50.763	2.7800	+15	43	34.32	12.785
ι Draconis . . .	3.5	15	23	2.326	+ 1.3334	+59	15	48.31	−12.671
32 Libræ . . .	5.9	15	23	27.596	3.3787	−16	25	15.31	12.695
ρ Octantis . . .	5.7	15	23	29.89*	13.3363	−84	11	5.28	12.569
β Coronæ Borealis .	3.7	15	24	19.475	2.4738	+29	23	53.12	12.515
ν¹ Boötis . . .	5.2	15	27	52.571	2.1552	+41	7	20.07	12.364
γ Lupi (*mean*) . . †	3.0	15	29	28.255	+ 3.9868	−40	52	55.46	−12.288
γ Libræ . . .	4.0	15	30	46.151	3.3524	−14	30	24.03	12.143
α Coronæ Borealis .	2.3	15	31	5.313	2.5394	+27	0	0.25	12.227
ζ Coronæ Borealis *seq.* †	5.1	15	36	10.632	2.2596	+36	54	40.29	11.782
α Serpentis . .	2.8	15	40	4.796	2.9530	+ 6	41	32.38	11.449
β Serpentis . .	3.7	15	42	15.876	+ 2.7685	+15	41	13.45	−11.390
κ Serpentis . .	4.3	15	44	54.765	2.6995	+18	24	11.83	11.243
μ Serpentis . .	3.6	15	45	10.949	+ 3.1284	− 3	10	15.08	−11.151

φ Virginis, comp. 9^m, 4″.5 s. f.
ε Boötis, comp. 5^m.1, 2″.8 n. pr.

δ Libræ, var., 2^d.33, 4^m.8–6^m.2
μ Boötis, star 6^m.7, 108″ s.

γ Lupi, binary 3^m.7, 3^m.9, 0″.4
ζ Cor. Bor., comp. 6^m.0, 6″.2 n. pr.

α Centauri, dup., 0^m.3, 1^m.7; companion s. pr. The position given is that of the center of gravity of the system. Corrections given on page ix remain to be applied to reduce to the position of α^2 Centauri.

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
12 H. Draconis . .	5.1	15	45	22.054	+0.9072	+62	51	43.02	−11.1
ε Serpentis . . .	3.8	15	46	34.648	+2.9883	+ 4	43	58.75	10.9
ζ Ursæ Minoris . .	4.3	15	47	4.094	−2.2036	+78	3	23.35	10.9
β Trianguli Australis .	3.0	15	47	38.490	+5.2572	−63	10	10.23	11.3
λ Libræ . . .	5.1	15	48	23.796	3.4774	−19	54	50.15	10.9
γ Serpentis . . .	3.9	15	52	31.567	+2.7697	+15	56	17.98	−11.8
π Scorpii . . .	3.0	15	53	42.394	3.6238	−25	52	13.02	10.5
ε Coronæ Borealis .	4.2	15	54	4.044	2.4823	+27	7	23.97	10.5
δ Scorpii . . .	2.5	15	55	18.247	3.5423	−22	22	50.38	10.4
θ Draconis . . .	4.1	16	0	17.734	1.1217	+58	47	31.11	9.6
β Scorpii . . . †	2.9	16	0	29.473	+3.4835	−19	34	24.98	−10.0
κ Herculis . . . †	5.3	16	4	14.227	2.7051	+17	16	20.89	9.7
Groombridge 2320 .	5.4	16	6	5.165	0.1528	+68	2	2.01	9.5
ϕ Herculis . . .	4.3	16	6	5.484	1.8898	+45	9	26.16	9.5
δ^{1} Apodis . . .	4.8	16	7	36.008	8.8535	−78	29	1.45	9.4
δ Ophiuchi . . .	3.0	16	9	53.373	+3.1415	− 3	28	34.40	− 9.4
σ Coronæ Bor. *seq.* . †	5.8	16	11	29.697	+2.2458	+34	4	24.81	9.21
19 Ursæ Minoris . .	5.5	16	13	13.911	−1.7483	+76	5	31.08	8.9
γ^{2} Normæ . . .	4.1	16	13	28.249	+4.4721	−49	56	53.18	9.04
ε Ophiuchi . . .	3.3	16	13	49.326	3.1718	− 4	29	10.00	8.9
σ Scorpii . . . †	3.1	16	16	1.137	+3.6416	−25	23	23.18	− 8.8
τ Herculis . . .	3.9	16	17	11.149	1.8031	+46	30	54.78	8.66
γ Herculis . . .	3.8	16	18	10.185	+2.6454	+19	21	7.03	8.5
η Ursæ Minoris . .	5.0	16	19	58.320	−1.7905	+75	57	5.99	8.22
γ Apodis . . .	3.9	16	20	22.413	+9.1024	−78	42	30.41	8.5
ω Herculis . . .	4.5	16	21	29.321	+2.7618	+14	13	41.60	− 8.41
η Draconis . . . †	2.9	16	22	50.274	0.8078	+61	42	22.83	8.18
α Scorpii . (*Antares*) †	1.2	16	24	11.574	3.6741	−26	14	39.44	8.16
β Herculis . . .	2.8	16	26	33.876	2.5774	+21	40	26.44	7.97
λ Ophiuchi . . . †	3.8	16	26	37.506	+3.0239	+ 2	10	8.98	8.0
A Draconis . . .	5.0	16	28	8.583	−0.1297	+68	57	7.41	− 7.78
τ Scorpii . . .	2.9	16	30	35.282	+3.7296	−28	2	26.34	7.65
σ Herculis . . .	4.2	16	31	21.748	1.9335	+42	36	41.87	7.53
ζ Ophiuchi . . .	2.7	16	32	28.593	3.3008	−10	23	44.78	7.44
24 Scorpii . . .	5.0	16	36	39.286	3.4666	−17	34	42.54	7.13
ζ Herculis . . . †	3.0	16	38	4.895	+2.2614	+31	45	22.12	− 6.62
α Trianguli Australis .	1.9	16	39	39.107	6.3235	−68	52	23.62	6.93
η Herculis . . .	3.6	16	39	58.872	2.0558	+39	4	59.66	6.95
Groombridge 2377 .	4.9	16	43	41.071	1.1373	+56	56	0.48	6.49
ε Scorpii . . .	2.4	16	44	39.268	3.8797	−34	8	24.25	6.73
49 Herculis . . .	6.4	16	48	12.623	+2.7302	+15	6	57.46	− 6.19
ε^{1} Aræ . . .	4.2	16	52	48.206	4.7712	−53	1	52.35	5.81
κ Ophiuchi . . .	3.4	16	53	38.638	+2.8382	+ 9	30	22.86	5.73
ε Ursæ Minoris . .	4.4	16	54	37.997	−6.2577	+82	10	44.05	5.64
30 Ophiuchi . . .	5.0	16	56	34.673	+3.1629	− 4	5	45.47	5.55
ε Herculis . . .	3.9	16	57	2.216	+2.2946	+31	3	3.13	− 5.41
d Herculis . . .	5.3	16	58	27.992	2.2120	+33	41	26.13	5.32
η Ophiuchi . . . †	2.6	17	5	30.075	+3.4375	−15	37	13.99	− 4.63

β Scorpii, comp. $5^{m}.1$, $13''.3$ n. f.
Herculis, star $6^{m}.5$, $29''.7$ n. f.
Bor., comp. $6^{m}.7$, $4''.6$ s. pr.

σ Scorpii, star 8^{m}, $21''$ pr.
η Draconis, comp. 8^{m}, $5''.4$ s. f.
α Scorpii, comp. 7^{m}, $3''.2$ pr.

λ Ophiuchi, comp. 6^{m}, $1''.2$ n. f.
ζ Herculis, binary, $3^{m}.0$, $6^{m}.0$, $1''$
η Oph., binary, $3^{m}.2$, $3^{m}.7$, $0''.5$

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Name of Star.		Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
			h	m	s	s	°	′	″	″
Scorpii		3.4	17	6	3.734	+ 4.2922	−43	7	42.20	−4.980
Draconis		3.2	17	8	32.305	0.1690	+65	49	9.16	4.446
Herculis	†	*var.*	17	10	46.261	2.7345	+14	29	10.94	4.243
Herculis	†	3.2	17	11	32.370	2.4632	+24	56	19.33	4.365
Herculis		3.4	17	12	5.139	2.0884	+36	54	15.46	4.161
Apodis (G.)		5.9	17	15	32.567	+11.1623	−80	46	58.79	−3.903
Ophiuchi		3.4	17	16	47.257	3.6818	−24	54	56.56	3.793
Herculis		5.4	17	17	28.680	2.2430	+32	34	34.77	4.745
Aræ		2.8	17	18	13.862	4.9809	−55	27	2.48	3.660
Ophiuchi		4.3	17	21	10.626	3.6609	−24	5	53.66	3.517
Ophiuchi		4.4	17	22	17.802	+ 2.9756	+ 4	12	48.44	−3.275
Aræ		3.8	17	23	25.226	5.4058	−60	36	52.45	3.306
Aræ		3.0	17	25	16.107	4.6328	−49	48	36.01	3.110
Herculis		4.5	17	27	18.174	2.4241	+26	10	26.42	2.832
Scorpii		1.7	17	27	50.090	4.0709	−37	2	33.95	2.832
Draconis		3.0	17	28	30.684	+ 1.3542	+52	21	49.93	−2.737
Ophiuchi		2.1	17	30	59.290	2.7838	+12	37	15.66	2.766
Serpentis		3.6	17	32	43.076	3.4329	−15	20	45.12	2.441
Herculis		3.8	17	37	3.939	1.6935	+46	3	3.81	2.000
η Pavonis		3.6	17	37	23.156	+ 5.8813	−64	41	4.97	2.055
Draconis		4.9	17	37	26.848	− 0.3542	+68	47	50.32	−1.651
Ophiuchi		2.9	17	39	16.387	+ 2.9629	+ 4	36	7.10	1.653
ι¹ Scorpii		3.1	17	41	38.363	4.1947	−40	5	42.51	1.612
Herculis		3.5	17	43	7.878	+ 2.3470	+27	46	10.86	2.223
Draconis	†	4.9	17	43	26.806	− 1.0742	+72	11	27.12	1.715
Ophiuchi		3.7	17	43	37.798	+ 3.0072	+ 2	44	18.38	−1.503
Herculis		5.5	17	51	59.469	2.4207	+26	3	46.13	0.695
Draconis		3.9	17	52	3.608	+ 1.0380	+56	53	8.48	0.618
Draconis		5.0	17	53	15.179	− 2.6902	+76	58	29.41	0.347
θ Herculis		4.0	17	53	20.263	+ 2.0570	+37	15	40.07	0.578
Ophiuchi		3.5	17	54	20.790	+ 3.3019	− 9	45	50.71	−0.614
ξ Herculis		3.8	17	54	27.714	2.3315	+29	15	22.89	0.502
γ Draconis		2.4	17	54	37.932	1.3925	+51	29	54.34	0.494
Ophiuchi		3.9	17	56	23.292	+ 3.0049	+ 2	56	5.30	−0.329
δ Ursæ Minoris		4.4	17	59	40.30*	−19.4981	+86	36	51.19	+0.019
θ Aræ		3.9	18	0	0.826	+ 4.6699	−50	5	54.70	−0.049
γ Sagittarii		3.1	18	0	20.778	3.8520	−30	25	34.24	0.168
Ophiuchi	†	4.1	18	1	9.496	3.0316	+ 2	31	5.91	−1.021
Ophiuchi		3.7	18	3	19.161	2.8433	+ 9	33	3.65	+0.377
o Herculis		3.8	18	4	13.580	2.3394	+28	45	0.20	0.372
χ Octantis		5.2	18	5	0.43*	+35.7348	−87	39	52.55	+0.312
μ Sagittarii		4.0	18	8	40.769	3.5870	−21	4	55.37	0.757
η Sagittarii		3.2	18	11	52.576	4.0597	−36	47	16.92	0.886
Groombridge 2533		5.4	18	13	0.119	1.8652	+42	7	47.25	1.135
36 Draconis		5.0	18	13	24.460	0.3456	+64	22	5.91	1.198
δ Sagittarii		2.8	18	15	33.142	+ 3.8406	−29	51	55.00	+1.326
η Serpentis		3.4	18	16	54.642	3.1028	− 2	55	18.03	0.786
ε Sagittarii		2.0	18	18	31.792	+ 3.9815	−34	25	32.56	+1.497

α Herculis, var. irreg., $3^m.1$–$3^m.9$, dup. comp. 6^m, 4″.6 s. f.

δ Herculis, binary, comp. 8^m, 12″ s. pr.

ψ Draconis, star $6^m.1$, 30″.4 n. f.

70 Ophiuchi, comp. 6^m, 2″.1 s.

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Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation
		h m s	s	° ′ ″	″
ν Tauri	3.9	3 58 38.001	+ 3.1896	+ 5 45 15.28	+10.12
A Tauri †	4.5	3 59 40.052	3.5433	+21 51 1.99	9.99
c Persei	4.0	4 2 29.150	4.3471	+47 29 11.80	9.80
p Tauri	5.6	4 5 39.079	3.6492	+26 15 35.98	9.55
o^1 Eridani	4.1	4 7 42.934	2.9273	− 7 3 30.28	9.519
Groombridge 750	6.7	4 9 27.362	+17.5817	+85 19 51.71	+ 9.34
μ Tauri	4.3	4 10 55.033	3.2556	+ 8 40 49.08	9.16
α Horologii	3.8	4 11 11.097	1.9874	−42 30 13.56	8.93
α Reticuli	3.4	4 13 19.541	0.7650	−62 41 11.08	9.041
γ Tauri	3.9	4 14 57.254	3.4116	+15 25 23.64	8.84
δ Tauri	3.9	4 18 1.841	+ 3.4569	+17 20 38.52	+ 8.597
υ^5 Eridani	4.1	4 20 50.633	2.2528	−34 12 49.46	8.447
ε Tauri	3.6	4 23 39.084	+ 3.5007	+18 59 34.14	8.147
δ Mensæ	5.6	4 23 41.271	− 4.1475	−80 24 50.32	8.29
m Persei †	6.1	4 27 25.825	+ 4.2151	+42 53 0.24	7.88
α Tauri (*Aldebaran*)	1.1	4 31 2.478	+ 3.4400	+16 20 21.52	+ 7.398
ν Eridani	4.1	4 32 4.240	2.9958	− 3 31 31.42	7.504
α Doradus	3.5	4 32 9.519	1.2947	−55 13 13.84	7.485
53 Eridani	4.0	4 34 17.155	2.7455	−14 28 9.75	7.169
τ Tauri	4.3	4 37 8.495	3.5986	+22 47 41.21	7.071
Groombridge 848	6.0	4 37 22.320	+ 8.0196	+75 47 18.33	+ 6.968
α Cœli	4.5	4 37 49.265	1.9300	−42 1 33.14	6.928
4 Camelopardalis	5.4	4 40 55.036	4.9866	+56 36 27.09	6.652
μ Eridani	4.2	4 41 15.094	2.9988	− 3 24 34.58	6.744
π^3 Orionis	3.3	4 45 13.471	3.2551	+ 6 48 49.86	6.448
9 Camelopardalis	4.4	4 45 35.540	+ 5.9481	+66 11 59.49	+ 6.399
i Tauri	5.1	4 46 23.995	3.5076	+18 41 46.04	6.293
π^5 Orionis	3.9	4 49 49.380	3.1240	+ 2 18 8.72	6.047
ι Aurigæ	2.9	4 51 27.348	3.9038	+33 1 57.14	5.885
β Camelopardalis	4.2	4 55 51.023	5.3257	+60 19 10.05	5.526
ε Aurigæ †	*var.*	4 55 52.017	+ 4.3012	+43 41 55.08	+ 5.523
ζ Aurigæ	3.9	4 56 32.023	4.1895	+40 57 10.53	5.459
ι Tauri	4.7	4 58 0.837	3.5847	+21 28 9.83	5.307
11 Orionis	4.6	4 59 42.650	3.4266	+15 17 11.96	5.177
η Aurigæ	3.3	5 0 33.117	4.2041	+41 7 14.19	5.070
ε Leporis	3.3	5 1 51.735	+ 2.5384	−22 29 4.16	+ 4.967
β Eridani	2.9	5 3 40.249	2.9492	− 5 11 43.62	4.803
μ Aurigæ	4.8	5 7 36.538	4.1017	+38 23 5.59	4.463
19 H. Camelopardalis	5.2	5 8 31.512	9.8334	+79 8 10.01	4.620
μ Leporis	3.3	5 9 6.773	2.6940	−16 18 19.23	4.386
α Aurigæ (*Capella*)	0.2	5 10 24.448	+ 4.4287	+45 54 45.93	+ 3.875
β Orionis (*Rigel*) †	0.3	5 10 27.127	2.8823	− 8 17 56.44	4.300
λ Aurigæ	4.8	5 13 9.585	4.2176	+40 1 28.81	3.409
τ Orionis	3.7	5 13 28.726	2.9125	− 6 56 7.54	4.036
o Columbæ	4.9	5 14 24.975	2.1588	−34 58 40.56	3.609
γ Orionis (*Bellatrix*)	1.7	5 20 34.277	+ 3.2170	+ 6 16 24.75	+ 3.415
β Tauri	1.8	5 20 55.053	3.7913	+28 32 12.08	3.225
17 Camelopardalis	5.8	5 22 8.323	+ 5.6597	+62 59 51.64	+ 3.289

A Tauri, star $6^m.5$ f. 38^s, 270″ s.
m Persei, star 6^m, 115″ s. pr.

ε Aurigæ, var. irreg., $3^m.0$–$4^m.5$.

β Orionis, comp. $8^m.0$, 9″.5 s. pr.

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Name of Star.		Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
			h m s	s	° ′ ″	″
β Leporis . . .		3.0	5 24 36.199	+ 2.5703	−20 49 35.17	+2.995
χ Aurigæ . . .		4.9	5 27 11.663	3.9039	+32 7 48.64	2.846
δ Orionis . . .	†	2.5	5 27 39.809	3.0643	− 0 21 40.31	2.816
Groombridge 966 .		6.4	5 28 21.045	8.0088	+74 59 22.90	2.776
ε Leporis . . .		2.7	5 28 58.865	2.6457	−17 52 56.65	2.704
φ¹ Orionis . . .		4.5	5 30 9.193	+ 3.2926	+ 9 25 58.17	+2.588
ι Orionis . . .	†	2.9	5 31 16.491	2.9342	− 5 57 53.66	2.504
ε Orionis . . .		1.8	5 31 53.988	3.0435	− 1 15 19.10	2.453
ζ Tauri . . .		3.0	5 32 33.850	3.5849	+21 5 29.69	2.362
Groombridge 944 .		6.4	5 34 35.250	18.7618	+85 9 25.87	2.214
ζ Orionis . . .	†	2.0	5 36 28.173	+ 3.0270	− 1 59 12.54	+2.041
α Columbæ . . .		2.8	5 36 34.264	2.1725	−34 7 8.00	2.007
ο Aurigæ . . .		5.5	5 39 18.817	4.6452	+49 47 24.84	1.788
ζ Leporis . . .		3.7	5 43 6.208	2.7179	−14 51 10.26	1.476
κ Orionis . . .		2.2	5 43 43.496	2.8449	− 9 41 56.49	1.419
β Doradus . . .		4.5	5 44 37.108	+ 0.1021	−65 46 2.69	+1.344
ν Aurigæ . . .		4.2	5 45 35.884	+ 4.1573	+39 7 29.15	1.272
1 Mensæ (G.) . .		6.2	5 46 38.12*	−11.6858	−84 49 49.43	1.255
δ Leporis . . .		3.9	5 47 39.924	+ 2.5796	−20 53 7.97	0.429
α Orionis (*Betelgeux*)	†	*var.*	5 50 34.187	3.2479	+ 7 23 31.66	0.834
δ Aurigæ . . .		3.9	5 52 31.753	+ 4.9418	+54 16 46.62	+0.535
η Leporis . . .		3.8	5 52 31.996	2.7323	−14 10 56.85	0.794
β Aurigæ . . .		2.1	5 53 17.660	4.4018	+44 56 24.07	0.580
θ Aurigæ . . .	†	2.7	5 53 55.502	4.0916	+37 12 27.69	+0.441
1 Geminorum . .		4.3	5 58 57.210	3.6475	+23 16 7.88	−0.017
1 Puppis (G.) . .	†	6.2	6 2 1.631	+ 1.7258	−45 2 9.90	+0.047
ν Orionis . . .		4.4	6 2 43.158	3.4264	+14 46 46.33	−0.263
2 H. Camelopardalis .		4.7	6 9 28.988	6.6184	+69 21 5.37	0.943
η Geminorum . .	†	*var.*	6 9 44.853	3.6227	+22 31 56.66	0.869
2 Lyncis . . .		4.4	6 12 7.607	5.2985	+59 2 35.59	1.030
ζ Canis Majoris . .		3.1	6 17 2.925	+ 2.3018	−30 1 30.99	−1.513
μ Geminorum . .		3.2	6 17 49.125	3.6307	+22 33 29.65	1.671
ψ¹ Aurigæ . . .		5.1	6 18 21.286	4.6260	+49 19 57.25	1.607
β Canis Majoris . .		2.0	6 18 57.372	2.6416	−17 54 46.37	1.652
8 Monocerotis . .	†	4.5	6 19 15.865	3.1802	+ 4 38 12.90	1.674
α Argûs (*Canopus*)		−0.9	6 22 3.901	+ 1.3319	−52 38 56.20	−1.918
10 Monocerotis . .		5.0	6 23 45.790	2.9641	− 4 42 31.38	2.068
ν Geminorum . .		4.1	6 23 54.979	3.5629	+20 16 0.97	2.104
8 Lyncis . . .		6.0	6 29 55.621	5.4921	+61 33 26.63	2.886
ξ² Canis Majoris . .		4.5	6 31 29.654	2.5157	−22 53 46.43	2.711
23 H. Camelopardalis .		5.6	6 31 44.976	+10.2989	+79 39 32.76	−3.401
51 Aurigæ . . .		5.7	6 32 46.215	4.1597	+39 28 0.74	2.969
γ Geminorum . .		1.9	6 32 48.129	3.4670	+16 28 21.89	2.907
ν Argûs . . .		3.2	6 35 9.709	1.8367	−43 7 15.40	3.082
S Monocerotis . .	†	4.7	6 36 17.836	3.3047	+ 9 58 30.86	3.170
ε Geminorum . .		3.2	6 38 42.204	+ 3.6928	+25 12 58.74	−3.387
ξ Geminorum . .		3.4	6 40 31.160	3.3684	+12 59 17.48	3.718
ψ⁵ Aurigæ . . .		5.3	6 40 36.961	+ 4.3298	+43 39 47.46	−3.374

δ Orionis, star 6^m.9, 52″.6 n.
Orionis, comp. 7^m.3, 11″.5 s. f.
ζ Orionis, comp. 4^m.2, 2″.4 s. f.

α Orionis, red star, var. irreg. 1^m.0–1^m.4.
θ Aurigæ, comp. 7^m.5, 2″.5, n. pr.
1 Puppis, star, 5^m.8, 150″ s. f.

η Gem., var. 231^d.4, 3^m.2–4^m.2, comp. 8^m.8, 1″.2 n. pr.
8 Monoc., star 6^m.5, 13″.7 n. f.
S Monoc., comp. 8^m.8. 2″.0 s. pr.

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Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Ann Variat
		h m s	s	° ′ ″	″
α Canis Majoris (*Sirius*) †	−1.6	6 41 24.147	+ 2.6434	−16 35 55.77	− 4.
18 Monocerotis	4.7	6 43 25.707	3.1281	+ 2 30 21.80	3.
43 Camelopardalis	5.1	6 44 32.874	+ 6.4884	+68 59 19.96	3.
ζ Mensæ	5.6	6 47 8.432	− 4.9417	−80 43 30.15	4.
θ Geminorum	3.6	6 47 11.329	+ 3.9582	+34 3 53.33	4.
α Pictoris	3.3	6 47 19.240	+ 0.6176	−61 51 0.16	− 3.
τ Argûs	2.8	6 47 49.608	1.4883	−50 30 47.80	4.
15 Lyncis †	4.5	6 49 55.390	5.2069	+58 32 8.08	4.
θ Canis Majoris	4.2	6 50 14.472	2.7879	−11 55 52.50	4.
ε Canis Majoris †	1.6	6 55 17.102	2.3574	−28 51 20.52	4.
ζ Geminorum †	*var.*	6 59 4.127	+ 3.5606	+20 41 45.29	− 5.
o^2 Canis Majoris	3.1	6 59 28.510	2.5048	−23 42 30.00	5.
γ Canis Majoris	4.1	6 59 54.790	2.7148	−15 30 24.90	5.
51 H. Cephei	5.3	7 1 5.64*	29.2318	+87 11 5.45	5.
δ Canis Majoris	2.0	7 4 56.055	2.4381	−26 15 27.17	5.
63 Aurigæ	5.1	7 5 48.725	+ 4.1329	+39 27 37.06	− 5.
51 Geminorum	5.3	7 8 29.521	+ 3.4480	+16 18 14.88	5.
γ^2 Volantis †	3.9	7 9 28.283	− 0.5012	−70 21 39.88	5.
λ Geminorum	3.6	7 13 12.571	+ 3.4502	+16 41 40.50	6.3
25 H. Camelopardalis	5.1	7 13 16.654	12.8254	+82 34 42.85	6.3
π Argûs	2.7	7 14 8.442	+ 2.1189	−36 56 40.18	− 6.3
δ Geminorum †	3.5	7 15 2.913	+ 3.5865	+22 8 23.28	6.4
δ Volantis	4.0	7 16 52.998	− 0.0194	−67 48 6.13	6.6
7 Octantis (G.)	6.4	7 17 0.79*	−20.2238	−86 53 53.55	6.6
ι Geminorum	3.9	7 20 26.978	+ 3.7304	+27 58 4.77	6.9
η Canis Majoris	2.4	7 20 44.023	+ 2.3738	−29 8 11.78	− 6.9
Groombridge 1308	5.8	7 22 2.963	6.2749	+68 38 27.05	7.0
β Canis Minoris	3.1	7 22 32.538	3.2554	+ 8 27 41.16	7.1
ρ Geminorum	4.2	7 23 38.789	3.8631	+31 57 16.89	6.9
σ Argûs †	3.3	7 26 31.996	1.9016	−43 7 43.66	7.2
α^2 Geminorum (*Castor*)	2.0	7 29 10.736	+ 3.8332	+32 4 34.45	− 7.6
α^1 Geminorum	2.8	$\Delta\alpha$ − 0.264	. . . .	$\Delta\delta$ − 4.13	. . .
25 Monocerotis	5.2	7 33 3.100	2.9819	− 3 55 13.16	7.8
α Can. Min. (*Procyon*) †	0.5	7 34 51.192	3.1421	+ 5 26 36.57	9.0
24 Lyncis	5.0	7 35 49.392	5.0937	+58 54 37.89	8.1
κ Geminorum †	3.7	7 39 19.122	+ 3.6265	+24 36 9.66	− 8.4
β Geminorum (*Pollux*)	1.2	7 40 7.018	3.6758	+28 13 56.71	8.5
4 Puppis	5.1	7 42 2.035	2.7636	−14 21 23.32	8.6
ξ Argûs	3.5	7 45 43.165	2.5232	−24 38 44.72	8.9
φ Geminorum	5.0	7 48 17.882	3.6766	+26 59 12.46	9.1
26 Lyncis	5.7	7 48 31.771	+ 4.3814	+47 47 9.69	− 9.1
Groombridge 1374	5.6	7 50 2.805	7.2441	+74 8 48.11	9.2
χ Argûs	3.6	7 54 37.092	1.5259	−52 45 14.71	9.6
ω Cancri	5.9	7 55 47.407	3.6339	+25 37 34.86	9.7
χ Geminorum	5.0	7 58 18.059	3.6903	+28 2 0.52	9.9
27 Lyncis	4.9	8 2 4.338	+ 4.5299	+51 45 10.18	−10.1
ρ Argûs	2.9	8 3 55.427	2.5546	−24 3 30.65	10.2
3 H. Ursæ Majoris	5.5	8 4 22.221	+ 6.0120	+68 43 32.57	−10.3

15 Lyncis, dup., $4^m.9$, $6^m.2$, 0″.7
ε Can. Maj., comp. 9^m, 7″.8 s. f.
ζ Gem., var., $10^d.15$, $3^m.7$–$4^m.3$

γ^2 Volantis, comp. $5^m.8$, 12″.9 n. pr.
δ Gem., comp. 8^m, 7″.0 s. pr.

σ Argûs, star. 8^m, 22″.4 n. f.
κ Gem., comp. 8^m. 5, 6″.6 s. pr.

Positions given for Sirius and Procyon are those of the centers of their orbits. Corrections given on page i remain to be applied to reduce to the positions of the stars.

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
Argûs †	2.2	8	6	54.847	+ 1.8498	−47	5	8.66	−10.553
Cancri (*mean*) †	4.7	8	7	20.353	3.4445	+17	54	18.16	10.702
Bradley 1147	5.7	8	8	53.844	7.6207	+76	1	4.57	10.696
Puppis	5.0	8	9	25.556	2.7580	−15	31	53.12	10.727
Cancri	3.8	8	11	54.404	3.2557	+ 9	26	53.87	10.963
Groombridge 1119	7.0	8	13	47.916	+60.5580	+88	53	22.50	−11.032
Lyncis	4.4	8	17	1.414	4.1209	+43	27	42.48	11.383
Cancri	5.9	8	18	29.938	3.4391	+18	36	21.16	11.421
Argûs	1.7	8	20	46.247	1.2338	−59	14	8.47	11.545
Monocerotis	4.0	8	21	24.869	+ 2.9996	− 3	37	42.18	11.618
Chamæleontis	4.3	8	23	12.619	− 1.7472	−77	12	38.80	−11.709
Ursæ Majoris	3.5	8	23	12.908	+ 5.0122	+61	0	12.47	11.839
Groombridge 1450	6.0	8	27	23.718	3.9092	+38	18	31.60	12.200
Cancri	5.5	8	27	47.760	3.4744	+20	43	50.34	12.105
Groombridge 1446	6.3	8	30	17.206	6.7448	+73	55	41.20	12.340
Hydræ	4.2	8	33	9.464	+ 3.1781	+ 6	0	3.19	−12.435
Hydræ	4.5	8	34	18.967	3.1383	+ 3	38	26.23	12.513
Cancri	4.7	8	38	22.201	3.4769	+21	46	29.82	12.818
Cancri	4.2	8	39	51.429	3.4138	+18	28	2.70	13.115
Pyxidis	3.7	8	40	10.562	2.4110	−32	52	45.90	12.886
Cancri †	4.2	8	41	33.460	+ 3.6379	+29	4	17.68	−13.040
Hydræ †	3.5	8	42	16.581	3.1797	+ 6	43	53.13	13.085
Argûs †	2.0	8	42	21.198	1.6517	−54	23	48.19	13.142
^{2} Cancri (*mean*) †	5.5	8	49	3.755	3.6680	+30	54	7.52	13.503
Hydræ	3.3	8	50	54.154	3.1744	+ 6	16	11.00	13.594
Ursæ Majoris	3.1	8	53	23.714	+ 4.1227	+48	22	34.26	−14.009
Cancri	4.3	8	53	50.424	3.2846	+12	11	14.60	13.830
b^{1} Carinæ †	5.1	8	54	53.563	1.4681	−58	54	3.91	13.874
Ursæ Majoris	3.7	8	57	49.777	4.1107	+47	29	36.53	14.106
^{2} Ursæ Majoris †	4.9	9	2	56.001	5.3221	+67	28	50.38	14.421
Cancri	5.1	9	3	8.719	+ 3.2527	+11	0	39.25	−14.380
λ Argûs	2.2	9	4	52.138	+ 2.2062	−43	5	20.84	14.479
ζ Octantis	5.4	9	9	14.21*	− 8.1212	−85	19	28.08	14.691
θ Hydræ	3.8	9	9	56.613	+ 3.1236	+ 2	40	24.73	15.088
β Argûs	1.8	9	12	16.325	0.6699	−69	22	1.19	14.819
13 Cancri	6.6	9	14	14.425	+ 3.3536	+18	3	58.66	−15.164
ι Argûs	2.2	9	14	48.782	1.6040	−58	55	5.45	15.054
10 Lyncis	3.3	9	15	52.878	3.6635	+34	45	9.62	15.109
θ Pyxidis	4.9	9	17	43.581	2.6514	−25	36	12.89	15.259
α Hydræ	2.2	9	23	24.653	2.9487	− 8	17	22.41	15.513
h Ursæ Majoris	3.8	9	24	50.659	+ 4.7652	+63	26	3.55	−15.600
1 H. Draconis	4.6	9	25	4.133	8.8008	+81	42	12.85	15.664
d Ursæ Majoris	4.6	9	26	59.460	5.3602	+70	12	17.40	15.671
θ Ursæ Majoris	3.3	9	27	10.855	4.0304	+52	3	55.70	16.295
ψ Argûs †	3.6	9	27	20.963	2.3594	−40	5	40.03	15.723
ξ Leonis	5.1	9	27	21.973	+ 3.2369	+11	40	36.59	−15.845
10 Leonis Minoris	4.6	9	29	1.282	+ 3.6851	+36	46	32.30	15.872
Chamæleontis	5.2	9	36	25.656	− 1.6513	−80	33	34.39	−16.220

γ Argûs, star 5^{m}, $42''.5$ s. pr.
ζ Cancri, triple; binary $5^{m}.6$, $6^{m}.3$, $1''$ with comp. $6^{m}.0$, $5''.4$ s. f.
ι Cancri, star $6^{m}.6$, $30''.6$ n. pr.

ε Hydræ, triple; binary $3^{m}.5$ $6^{m}.8$, $0''.2$, with comp. $7^{m}.8$, $3''.3$.
δ Argûs, comp. 5^{m}, $2''$ s.
σ^{2} Cancri, dup. $5^{m}.9$, $6^{m}.4$, $1''.4$

b^{1} Carinæ, comp. $7^{m}.2$, 5^{s} f.
σ^{2} Urs. Maj., binary $4^{m}.9$, 8^{m}, $1''.3$
ψ Argûs, dup. $3^{m}.8$, $6^{m}.0$, $0''.8$

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annu Variati
		h	m	s	s	°	′	″	″
o Leonis	3.8	9	36	36.960	+3.2050	+10	16	46.82	−16.
θ Antliæ	5.0	9	40	24.734	2.6731	−27	22	47.43	16.
ε Leonis	3.1	9	41	1.771	3.4110	+24	9	58.02	16.
υ Ursæ Majoris	3.9	9	44	57.451	4.2921	+59	26	21.17	16.
υ Argûs †	3.2	9	44	58.688	1.5008	−64	40	39.35	16.
6 Sextantis	6.0	9	46	57.087	+3.0245	− 3	50	40.00	−16
μ Leonis	4.1	9	47	55.921	3.4171	+26	24	28.24	16.
Groombridge 1586	6.0	9	50	48.739	5.4305	+73	17	3.77	17.
19 Leonis Minoris	5.2	9	52	29.029	3.6850	+41	27	39.74	17.
φ Argûs	3.7	9	53	52.556	2.1016	−54	9	46.90	17.
π Leonis	4.9	9	55	43.375	+3.1722	+ 8	27	9.09	−17.
η Leonis	3.6	10	2	41.951	3.2727	+17	10	39.51	17.
α Leonis (*Regulus*)	1.3	10	3	50.825	3.1982	+12	22	59.05	17.
λ Hydræ	3.8	10	6	26.654	2.9247	−11	56	0.44	17.
q Velorum	4.1	10	11	9.860	2.5129	−41	42	1.69	17.
32 Ursæ Majoris	5.7	10	11	52.653	+4.3934	+65	31	58.59	−17
ζ Leonis	3.6	10	11	57.954	3.3422	+23	50	28.88	17
λ Ursæ Majoris	3.5	10	11	58.636	3.6311	+43	20	21.76	17
γ Leonis *pr.* †	2.6	10	15	17.315	3.3116	+20	16	18.99	18.
μ Ursæ Majoris	3.2	10	17	16.275	3.5859	+41	55	38.82	18.
30 H. Ursæ Majoris	4.9	10	18	1.440	+4.3620	+65	59	48.46	−18.
30 H. Camelopardalis	5.3	10	20	49.679	7.5850	+82	59	30.46	18.
μ Hydræ	4.1	10	21	58.735	2.9005	−16	24	7.03	18.
31 Leonis Minoris	4.4	10	22	58.420	3.4791	+37	8	35.19	18.
α Antliæ	4.4	10	23	15.630	2.7424	−30	38	5.93	18.
36 Ursæ Majoris	4.8	10	25	11.852	+3.8608	+56	25	0.55	−18.
9 H. Draconis	5.0	10	27	54.385	5.1845	+76	9	4.96	18.
ρ Leonis	3.8	10	28	20.236	3.1616	+ 9	44	39.87	18.
33 Sextantis	6.4	10	37	4.733	3.0519	− 1	17	39.07	18.
41 Leonis Minoris	5.0	10	38	47.842	3.2671	+23	38	1.50	18.
θ Argûs	3.0	10	39	55.223	+2.1324	−63	56	57.98	−18.
42 Leonis Minoris	5.4	10	41	8.529	3.3425	+31	7	49.16	18.
η Argûs †	*var.*	10	41	45.592	2.3208	−59	14	14.78	18.
μ Argûs †	2.8	10	43	6.611	2.5736	−48	58	15.91	19.
l Leonis	5.3	10	44	47.473	3.1564	+10	59	42.68	19.
δ^2 Chamæleontis †	4.6	10	44	59.830	+0.5941	−80	5	30.67	−18.
ν Hydræ	3.3	10	45	25.774	2.9582	−15	44	54.10	18.
46 Leonis Minoris	3.9	10	48	33.747	3.3635	+34	40	24.43	19.
54 Leonis †	4.5	10	51	0.813	3.2530	+25	12	12.25	19.
ι Antliæ	4.7	10	52	45.515	2.7960	−36	40	50.23	19.
Groombridge 1706	6.3	10	53	11.477	+4.8888	+78	13	33.02	−19.
α Crateris	4.2	10	55	37.895	2.9206	−17	50	45.95	19.
d Leonis	5.0	10	56	10.282	3.0992	+ 4	4	26.68	19.
β Ursæ Majoris	2.4	10	56	43.315	3.6407	+56	50	17.88	19
α Ursæ Majoris	2.0	10	58	29.677	+3.7286	+62	12	36.50	19
η Octantis	6.3	10	59	56.00*	−0.3564	−84	8	11.87	−19
χ Leonis	4.7	11	0	38.013	+3.0961	+ 7	47	45.22	19
p^4 Leonis	5.7	11	2	34.123	+3.0613	+ 2	25	2.26	−19

υ Argûs, comp. 6^{m}.0, 4″.9 s. f.
γ Leonis, comp. 3^{m}.8, 3″.7 s. f.

η Argûs, var., irreg., 1^{m}.6–6^{m}.6
μ Argûs, comp. 7^{m}, 2″.2 n. f.

δ^2 Cham., star 5^{m}.5 pr. 32^{s}, 256″ n.
54 Leonis, comp. 6^{m}.3, 6″.4 s. f.

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Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
Ursæ Majoris . .	3.2	11 4 53.468	+3.3851	+44 57 35.81	−19.502
Crateris . . .	4.5	11 7 28.530	2.9476	−22 21 42.15	19.628
Leonis . . .	2.6	11 9 35.433	3.1952	+20 59 22.42	19.703
Leonis . . .	3.4	11 9 46.859	3.1505	+15 53 39.62	19.651
Ursæ Majoris . .	3.7	11 13 53.502	3.2480	+33 33 29.97	19.615
Crateris . . .	3.8	11 15 5.381	+2.9974	−14 19 6.26	−19.467
Leonis . . .	4.1	11 16 45.270	3.0950	+ 6 29 43.50	19.702
Centauri . . .	4.3	11 17 7.546	2.7260	−54 1 30.24	19.709
Leonis . . . †	4.0	11 19 29.634	3.1286	+10 59 51.30	19.817
Leonis . . .	5.2	11 23 33.984	3.0858	+ 3 19 28.29	19.809
Draconis . . .	4.1	11 26 22.439	+3.5964	+69 48 1.25	−19.851
Hydræ . . .	3.7	11 28 49.112	2.9462	−31 23 14.19	19.915
Centauri . . .	3.3	11 31 51.141	2.7502	−62 32 58.03	19.921
Leonis . . .	4.5	11 32 35.798	3.0716	− 0 21 15.61	19.863
Chamæleontis . .	5.7	11 33 44.826	2.4529	−75 25 33.58	19.937
Draconis . . .	5.5	11 37 44.648	+3.3731	+67 12 55.43	−19.916
Crateris . . .	4.9	11 40 27.154	3.0376	−17 52 41.26	20.014
Ursæ Majoris . .	3.8	11 41 34.089	3.1801	+48 15 2.66	19.961
β Leonis (*Denebola*)	2.2	11 44 43.528	3.0624	+15 2 50.16	20.119
β Virginis . . .	3.8	11 46 16.060	3.1252	+ 2 14 37.73	20.284
Groombridge 1830 .	6.5	11 48 5.075	+3.4677	+38 19 43.70	−25.802
γ Ursæ Majoris . .	2.5	11 49 22.014	3.1700	+54 10 2.51	20.020
π Virginis . . .	4.6	11 56 31.032	3.0742	+ 7 5 17.87	20.075
o Virginis . . .	4.2	12 0 52.794	3.0570	+ 9 12 17.97	20.013
δ Centauri . . .	2.9	12 3 56.796	3.0952	−50 14 57.05	20.072
ε Corvi . . .	3.2	12 5 45.044	+3.0812	−22 8 49.52	−20.037
4 H. Draconis . .	5.1	12 8 13.957	2.8477	+78 5 18.74	20.013
δ Crucis . . .	3.1	12 10 37.713	3.1749	−58 16 35.20	20.062
δ Ursæ Majoris . .	3.4	12 11 13.649	2.9848	+57 30 17.54	20.016
γ Corvi . . .	2.8	12 11 25.941	3.0817	−17 4 11.83	20.004
2 Canum Venaticorum . †	5.8	12 11 52.324	+3.0160	+41 7 59.40	−20.065
β Chamæleontis . .	4.4	12 13 19.926	3.4477	−78 50 24.94	19.995
Bradley 1672 . .	6.3	12 14 27.688	0.3615	+88 10 15.98	19.947
η Virginis . . .	4.0	12 15 33.429	3.0693	− 0 11 40.25	20.027
α^1 Crucis . . .	1.6	12 21 51.556	3.3121	−62 37 41.44	19.994
α^2 Crucis . . .	2.1	$\Delta\alpha$ + 0.614	. . . .	$\Delta\delta$ − 1.28	. . . .
20 Comæ . . .	5.7	12 25 27.180	+3.0183	+21 22 0.10	−19.958
δ Corvi . . . †	3.1	12 25 27.862	3.1012	−16 2 32.34	20.070
γ Crucis . . . †	1.6	12 26 26.420	3.3035	−56 38 13.90	20.173
8 Canum Venaticorum .	4.3	12 29 42.626	2.8564	+41 49 9.01	19.598
κ Draconis . . .	3.9	12 29 51.770	+2.5776	+70 15 23.98	−19.866
β Corvi . . .	2.8	12 29 55.114	3.1454	−22 55 36.53	19.936
24 Comæ *seq.* . . †	5.2	12 30 52.010	3.0107	+18 50 41.21	19.851
α Muscæ . . .	2.9	12 32 5.988	3.5415	−68 40 2.42	19.878
χ Virginis . . .	4.8	12 34 51.448	3.0937	− 7 31 40.65	19.845
γ Centauri . . . †	2.4	12 36 49.362	+3.2946	−48 29 35.47	−19.807
γ Virginis (*mean*) . †	2.9	12 37 21.210	3.0398	− 0 59 0.07	19.776
ρ Virginis . . .	5.0	12 37 34.974	+3.0372	+10 42 13.65	−19.883

ι Leonis, comp. 6^{m}.8, 2″.6 n. f.
2 Can. Ven., star 8^{m}, 11″.6 s. pr.
δ Corvi, star 8^{m}, 24″.4 s. pr.

γ Crucis, star 6^{m}.6, 85″ n. f.
24 Comæ, star 6^{m}.7, 20″.6 pr.
γ Cent., dup., 3^{m}.1, 3^{m}.1, 1″.7

γ Virginis, binary, 3^{m}.7, 3^{m}.7, 6″.2, P=328°

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Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation
		h m s	s	° ′ ″	″
76 Ursæ Majoris	5.9	12 37 51.390	+2.6314	+63 10 46.47	−19.7
β Crucis	1.5	12 42 44.680	3.4823	−59 13 27.68	19.7
ι Octantis	5.4	12 45 55.22*	5.9557	−84 39 43.10	19.6
31 Comæ	5.1	12 47 33.559	2.9240	+28 0 10.80	19.6
32 H. Camelop. *seq.* †	5.3	12 48 29.536	0.4388	+83 52 29.63	19.5
n Centauri	4.3	12 48 43.435	+3.3128	−39 43 0.51	−19.6
ε Ursæ Majoris (*Alioth*)	1.7	12 50 17.640	2.6482	+56 25 15.62	19.5
δ Virginis	3.7	12 51 19.267	3.0208	+ 3 51 33.00	19.6
α Canum Venat. *seq.* †	2.9	12 52 3.235	2.8106	+38 46 37.95	19.4
δ Muscæ	3.6	12 56 24.108	4.0726	−71 5 26.22	19.4
ε Virginis	3.0	12 57 56.741	+2.9865	+11 24 56.75	−19.3
θ Virginis †	4.4	13 5 32.829	3.1032	− 5 5 7.72	19.2
43 Comæ	4.3	13 7 54.514	2.8025	+28 18 31.63	18.
20 Canum Venaticorum	4.7	13 13 44.057	2.6956	+41 1 11.61	19.0
γ Hydræ	3.3	13 14 17.827	3.2555	−22 43 24.10	19.0
ι Centauri	2.9	13 15 48.741	+3.3616	−36 15 51.30	−19.0
ζ¹ Ursæ Maj.. (*Mizar*) †	2.4	13 20 30.405	2.4221	+55 22 8.38	18.8
ζ² Ursæ Majoris	4.0	*Δα* +·0.959	. . . .	*Δδ* − 12.70	. . .
α Virginis (*Spica*)	1.2	13 20 42.776	3.1570	−10 43 4.50	18.8
Groombridge 2001	6.1	13 23 57.867	1.5243	+72 49 57.36	18.7
70 Virginis	5.2	13 24 16.359	+2.9340	+14 13 56.80	−19.2
κ Octantis	5.6	13 26 56.42*	9.0822	−85 21 4.95	18.6
ζ Virginis	3.4	13 30 21.625	3.0545	− 0 9 41.83	18.4
17 H. Canum Venaticorum	5.0	13 31 0.209	2.6817	+37 37 3.52	18.4
ε Centauri	2.6	13 34 29.567	3.7802	−53 2 5.10	18.4
m Virginis	5.2	13 37 8.910	+3.1452	− 8 16 28.09	−18.2
τ Boötis	4.5	13 43 13.369	2.8508	+17 52 47.83	18.0
η Ursæ Majoris (*Alkaid*)	1.9	13 44 11.605	2.3680	+49 44 13.63	18.0
89 Virginis	5.1	13 45 14.978	3.2541	−17 42 40.10	18.0
ζ Centauri	3.1	13 50 13.771	3.7256	−46 52 13.73	17.8
η Boötis	2.8	13 50 38.254	+2.8567	+18 49 24.20	−18.1
θ Apodis †	*var.*	13 57 0.213	5.7399	−76 23 13.79	17.5
τ Virginis	4.3	13 57 19.165	3.0513	+ 1 57 19.56	17.5
11 Boötis	6.1	13 57 19.286	2.7215	+27 47 47.97	17.4
β Centauri	0.9	13 57 48.819	4.2058	−59 57 48.55	17.4
π Hydræ	3.5	14 1 31.624	+3.4094	−26 16 24.30	−17.4
θ Centauri	2.3	14 1 40.478	3.5196	−35 57 8.22	17.8
α Draconis	3.6	14 2 5.304	1.6244	+64 46 54.53	17.2
d Boötis	4.8	14 6 31.390	2.7370	+25 29 37.59	17.1
κ Virginis	4.3	14 8 21.561	+3.1968	− 9 52 42.89	16.8
4 Ursæ Minoris	5.0	14 9 9.611	−0.2816	+77 56 48.72	−16.9
ι Virginis	4.2	14 11 33.307	+3.1424	− 5 35 43.30	17.2
α Boötis (*Arcturus*)	0.2	14 11 47.030	2.7355	+19 37 28.04	18.8
λ Boötis	4.3	14 13 9.239	2.2831	+46 28 41.47	16.6
δ Octantis	4.1	14 13 9.28*	9.2466	−83 16 47.50	16.7
λ Virginis	4.6	14 14 30.430	+3.2408	−12 58 49.37	−16.6
2 Libræ	6.3	14 18 51.030	3.2237	−11 19 34.81	16.5
θ Boötis	4.1	14 22 18.243	+2.0433	+52 14 35.61	−16.7

32 H. Cam., star $5^m.8$, 21″.6 n. pr.
α Can. Ven., star 5^m, 19″.8 s. pr.

θ Virginis, comp. 9^m, 7″.1 n. pr.
ζ¹ Urs. Maj., star Alcor $4^m.0$, f. $79^s.2$ 222″ n.

θ Apodis, var. irreg., $5^m.5$–$6^m.6$

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
f Boötis	5.4	14	22	30.123	+ 2.7901	+19	36	30.67	−16.279
φ Virginis †	5.0	14	23	49.280	+ 3.0889	− 1	50	50.69	16.230
5 Ursæ Minoris	4.4	14	27	41.302	− 0.1627	+76	4	26.15	16.004
ρ Boötis	3.8	14	28	10.035	+ 2.5865	+30	44	38.50	15.887
γ Boötis	3.0	14	28	39.366	2.4172	+38	40	46.56	15.829
η Centauri	2.6	14	30	6.229	+ 3.7969	−41	47	6.06	−15.929
σ Boötis	4.5	14	30	58.810	2.6131	+30	6	50.05	15.726
α Centauri †	0.1	14	33	48.941	4.0547	−60	29	6.76	14.974
53 Boötis	5.4	14	35	40.501	2.2342	+44	46	14.81	15.640
α Apodis	3.8	14	37	14.370	7.2950	−78	41	6.42	15.534
μ Virginis	4.0	14	38	34.732	+ 3.1586	− 5	17	21.29	−15.758
ε Boötis †	2.7	14	41	16.494	2.6203	+27	25	55.12	15.275
09 Virginis	3.8	14	41	57.024	3.0312	+ 2	15	1.72	15.280
8 Libræ	5.3	14	45	58.934	3.3132	−15	38	39.87	15.088
α Libræ	2.9	14	46	10.380	3.3138	−15	41	21.05	15.080
Groombridge 2164	5.7	14	49	16.884	+ 1.5202	+59	38	20.62	−14.704
β Ursæ Minoris	2.2	14	50	56.467	− 0.2046	+74	30	10.25	14.721
ξ^2 Libræ	5.6	14	52	9.179	+ 3.2505	−11	4	2.22	14.652
Piazzi 221	5.8	14	52	12.434	2.8297	+14	47	21.14	14.659
β Lupi	2.8	14	52	57.352	3.9131	−42	47	32.73	14.666
δ Libræ †	*var.*	14	56	25.691	+ 3.2013	− 8	10	56.32	−14.409
β Boötis	3.6	14	58	44.662	2.2600	+40	43	31.03	14.292
γ Scorpii	3.4	14	59	5.502	3.5048	−24	56	54.64	14.278
ψ Boötis	4.7	15	0	48.194	2.5703	+27	16	42.50	14.138
c Boötis	5.0	15	3	34.057	+ 2.6347	+25	11	58.37	14.136
Groombridge 2283	7.2	15	4	20.10*	−19.5312	+87	33	38.31	−13.873
ζ Lupi	3.5	15	6	10.234	+ 4.2917	−51	46	34.94	13.853
ι Libræ	4.7	15	7	22.364	3.4142	−19	28	15.06	13.764
γ Trianguli Australis	3.1	15	10	57.253	5.5527	−68	22	0.14	13.523
3 Serpentis	5.4	15	10	57.747	2.9800	+ 5	15	15.36	13.485
δ Boötis	3.5	15	12	4.567	+ 2.4193	+33	37	52.65	−13.533
β Libræ	2.7	15	12	25.843	+ 3.2248	− 9	4	11.92	13.409
γ Ursæ Minoris	3.1	15	20	51.290	− 0.1157	+72	8	11.12	12.815
μ Boötis *pr.* †	4.5	15	21	16.763	+ 2.2664	+37	40	28.94	12.718
τ^1 Serpentis	5.5	15	21	50.763	2.7800	+15	43	34.32	12.785
ι Draconis	3.5	15	23	2.326	+ 1.3334	+59	15	48.31	−12.671
32 Libræ	5.9	15	23	27.596	3.3787	−16	25	15.31	12.695
ρ Octantis	5.7	15	23	29.89*	13.3363	−84	11	5.28	12.569
β Coronæ Borealis	3.7	15	24	19.475	2.4738	+29	23	53.12	12.515
ν^1 Boötis	5.2	15	27	52.571	2.1552	+41	7	20.07	12.364
γ Lupi (*mean*) †	3.0	15	29	28.255	+ 3.9868	−40	52	55.46	−12.288
γ Libræ	4.0	15	30	46.151	3.3524	−14	30	24.03	12.143
α Coronæ Borealis	2.3	15	31	5.313	2.5394	+27	0	0.25	12.227
ζ Coronæ Borealis *seq.* †	5.1	15	36	10.632	2.2596	+36	54	40.29	11.782
α Serpentis	2.8	15	40	4.796	2.9530	+ 6	41	32.38	11.449
β Serpentis	3.7	15	42	15.876	+ 2.7685	+15	41	13.45	−11.390
κ Serpentis	4.3	15	44	54.765	2.6995	+18	24	11.83	11.243
μ Serpentis	3.6	15	45	10.949	+ 3.1284	− 3	10	15.08	−11.151

φ Virginis, comp. 9^{m}, 4″.5 s. f.
ε Boötis, comp. $5^{m}.1$, 2″.8 n. pr.
δ Libræ, var., $2^{d}.33$, $4^{m}.8$–$6^{m}.2$
μ Boötis, star $6^{m}.7$, 108″ s.
γ Lupi, binary $3^{m}.7$, $3^{m}.9$, 0″.4
ζ Cor. Bor., comp. $6^{m}.0$, 6″.2 n. pr.

α Centauri, dup., $0^{m}.3$, $1^{m}.7$; companion s. pr. The position given is that of the center of gravity of the system. Corrections given on page ix remain to be applied to reduce to the position of α^2 Centauri.

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Name of Star.		Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annua Variat
			h	m	s	s	°	′	″	″
12 H. Draconis		5.1	15	45	22.054	+0.9072	+62	51	43.02	−11.1
ε Serpentis		3.8	15	46	34.648	+2.9883	+ 4	43	58.75	10.9
ζ Ursæ Minoris		4.3	15	47	4.094	−2.2036	+78	3	23.35	10.9
β Trianguli Australis		3.0	15	47	38.490	+5.2572	−63	10	10.23	11.3
λ Libræ		5.1	15	48	23.796	3.4774	−19	54	50.15	10.9
γ Serpentis		3.9	15	52	31.567	+2.7697	+15	56	17.98	−11.8
π Scorpii		3.0	15	53	42.394	3.6238	−25	52	13.02	10.5
ε Coronæ Borealis		4.2	15	54	4.044	2.4823	+27	7	23.97	10.5
δ Scorpii		2.5	15	55	18.247	3.5423	−22	22	50.38	10.4
θ Draconis		4.1	16	0	17.734	1.1217	+58	47	31.11	9.6
β Scorpii	†	2.9	16	0	29.473	+3.4835	−19	34	24.98	−10.0
κ Herculis	†	5.3	16	4	14.227	2.7051	+17	16	20.89	9.7
Groombridge 2320		5.4	16	6	5.165	0.1528	+68	2	2.01	9.5
φ Herculis		4.3	16	6	5.484	1.8898	+45	9	26.16	9.5
δ^1 Apodis		4.8	16	7	36.008	8.8535	−78	29	1.45	9.4
δ Ophiuchi		3.0	16	9	53.373	+3.1415	− 3	28	34.40	− 9.4
σ Coronæ Bor. *seq.*	†	5.8	16	11	29.697	+2.2458	+34	4	24.81	9.2
19 Ursæ Minoris		5.5	16	13	13.911	−1.7483	+76	5	31.08	8.9
γ^2 Normæ		4.1	16	13	28.249	+4.4721	−49	56	53.18	9.0
ε Ophiuchi		3.3	16	13	49.326	3.1718	− 4	29	10.00	8.9
σ Scorpii	†	3.1	16	16	1.137	+3.6416	−25	23	23.18	− 8.8
τ Herculis		3.9	16	17	11.149	1.8031	+46	30	54.78	8.6
γ Herculis		3.8	16	18	10.185	+2.6454	+19	21	7.03	8.5
η Ursæ Minoris		5.0	16	19	58.320	−1.7905	+75	57	5.99	8.2
γ Apodis		3.9	16	20	22.413	+9.1024	−78	42	30.41	8.5
ω Herculis		4.5	16	21	29.321	+2.7618	+14	13	41.60	− 8.4
η Draconis	†	2.9	16	22	50.274	0.8078	+61	42	22.83	8.1
α Scorpii . (*Antares*)	†	1.2	16	24	11.574	3.6741	−26	14	39.44	8.1
β Herculis		2.8	16	26	33.876	2.5774	+21	40	26.44	7.97
λ Ophiuchi	†	3.8	16	26	37.506	+3.0239	+ 2	10	8.98	8.0
A Draconis		5.0	16	28	8.583	−0.1297	+68	57	7.41	− 7.78
τ Scorpii		2.9	16	30	35.282	+3.7296	−28	2	26.34	7.65
σ Herculis		4.2	16	31	21.748	1.9335	+42	36	41.87	7.53
ζ Ophiuchi		2.7	16	32	28.593	3.3008	−10	23	44.78	7.44
24 Scorpii		5.0	16	36	39.286	3.4666	−17	34	42.54	7.13
ζ Herculis	†	3.0	16	38	4.895	+2.2614	+31	45	22.12	− 6.62
α Trianguli Australis		1.9	16	39	39.107	6.3235	−68	52	23.62	6.93
η Herculis		3.6	16	39	58.872	2.0558	+39	4	59.66	6.95
Groombridge 2377		4.9	16	43	41.071	1.1373	+56	56	0.48	6.49
ε Scorpii		2.4	16	44	39.268	3.8797	−34	8	24.25	6.73
49 Herculis		6.4	16	48	12.623	+2.7302	+15	6	57.46	− 6.19
ε^1 Aræ		4.2	16	52	48.206	4.7712	−53	1	52.35	5.81
κ Ophiuchi		3.4	16	53	38.638	+2.8382	+ 9	30	22.86	5.73
ε Ursæ Minoris		4.4	16	54	37.997	−6.2577	+82	10	44.05	5.64
30 Ophiuchi		5.0	16	56	34.673	+3.1629	− 4	5	45.47	5.55
ε Herculis		3.9	16	57	2.216	+2.2946	+31	3	3.13	− 5.41
d Herculis		5.3	16	58	27.992	2.2120	+33	41	26.13	5.32
η Ophiuchi	†	2.6	17	5	30.075	+3.4375	−15	37	13.99	− 4.63

β Scorpii, comp. $5^m.1$, 13″.3 n. f.
κ Herculis, star $6^m.5$, 29″.7 n. f.
σ Cor. Bor., comp. $6^m.7$, 4″.6 s. pr.
σ Scorpii, star 8^m, 21″ pr.
η Draconis, comp. 8^m, 5″.4 s. f.
α Scorpii, comp. 7^m, 3″.2 pr.
λ Ophiuchi, comp. 6^m, 1″.2 n. f.
ζ Herculis, binary, $3^m.0$, $6^m.0$, 1″
η Oph., binary, $3^m.2$, $3^m.7$, 0″.5

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
η Scorpii . . .	3.4	17	6	3.734	+ 4.2922	−43	7	42.20	−4.980
ζ Draconis . . .	3.2	17	8	32.305	0.1690	+65	49	9.16	4.446
α Herculis . . . †	*var.*	17	10	46.261	2.7345	+14	29	10.94	4.243
δ Herculis . . . †	3.2	17	11	32.370	2.4632	+24	56	19.33	4.365
π Herculis . . .	3.4	17	12	5.139	2.0884	+36	54	15.46	4.161
Apodis (G.) . .	5.9	17	15	32.567	+11.1623	−80	46	58.79	−3.903
θ Ophiuchi . . .	3.4	17	16	47.257	3.6818	−24	54	56.56	3.793
Herculis . . .	5.4	17	17	28.680	2.2430	+32	34	34.77	4.745
β Aræ . . .	2.8	17	18	13.862	4.9809	−55	27	2.48	3.660
Ophiuchi . . .	4.3	17	21	10.626	3.6609	−24	5	53.66	3.517
Ophiuchi . . .	4.4	17	22	17.802	+ 2.9756	+ 4	12	48.44	−3.275
δ Aræ . . .	3.8	17	23	25.226	5.4058	−60	36	52.45	3.306
α Aræ . . .	3.0	17	25	16.107	4.6328	−49	48	36.01	3.110
λ Herculis . . .	4.5	17	27	18.174	2.4241	+26	10	26.42	2.832
λ Scorpii . . .	1.7	17	27	50.090	4.0709	−37	2	33.95	2.832
β Draconis . . .	3.0	17	28	30.684	+ 1.3542	+52	21	49.93	−2.737
α Ophiuchi . . .	2.1	17	30	59.290	2.7838	+12	37	15.66	2.766
ξ Serpentis . . .	3.6	17	32	43.076	3.4329	−15	20	45.12	2.441
ι Herculis . . .	3.8	17	37	3.939	1.6935	+46	3	3.81	2.000
η Pavonis . . .	3.6	17	37	23.156	+ 5.8813	−64	41	4.97	2.055
ω Draconis . . .	4.9	17	37	26.848	− 0.3542	+68	47	50.32	−1.651
β Ophiuchi . . .	2.9	17	39	16.387	+ 2.9629	+ 4	36	7.10	1.653
ι¹ Scorpii . . .	3.1	17	41	38.363	4.1947	−40	5	42.51	1.612
μ Herculis . . .	3.5	17	43	7.878	+ 2.3470	+27	46	10.86	2.223
ψ Draconis . . . †	4.9	17	43	26.806	− 1.0742	+72	11	27.12	1.715
γ Ophiuchi . . .	3.7	17	43	37.798	+ 3.0072	+ 2	44	18.38	−1.503
89 Herculis . . .	5.5	17	51	59.469	2.4207	+26	3	46.13	0.695
ξ Draconis . . .	3.9	17	52	3.608	+ 1.0380	+56	53	8.48	0.618
35 Draconis . . .	5.0	17	53	15.179	− 2.6902	+76	58	29.41	0.347
θ Herculis . . .	4.0	17	53	20.263	+ 2.0570	+37	15	40.07	0.578
ν Ophiuchi . . .	3.5	17	54	20.790	+ 3.3019	− 9	45	50.71	−0.614
ξ Herculis . . .	3.8	17	54	27.714	2.3315	+29	15	22.89	0.502
γ Draconis . . .	2.4	17	54	37.932	1.3925	+51	29	54.34	0.494
67 Ophiuchi . . .	3.9	17	56	23.292	+ 3.0049	+ 2	56	5.30	−0.329
δ Ursæ Minoris . .	4.4	17	59	40.30*	−19.4981	+86	36	51.19	+0.019
θ Aræ . . .	3.9	18	0	0.826	+ 4.6699	−50	5	54.70	−0.049
γ Sagittarii . . .	3.1	18	0	20.778	3.8520	−30	25	34.24	0.168
70 Ophiuchi . . . †	4.1	18	1	9.496	3.0316	+ 2	31	5.91	−1.021
72 Ophiuchi . . .	3.7	18	3	19.161	2.8433	+ 9	33	3.65	+0.377
o Herculis . . .	3.8	18	4	13.580	2.3394	+28	45	0.20	0.372
χ Octantis . . .	5.2	18	5	0.43*	+35.7348	−87	39	52.55	+0.312
μ Sagittarii . . .	4.0	18	8	40.769	3.5870	−21	4	55.37	0.757
η Sagittarii . . .	3.2	18	11	52.576	4.0597	−36	47	16.92	0.886
Groombridge 2533 .	5.4	18	13	0.119	1.8652	+42	7	47.25	1.135
36 Draconis . . .	5.0	18	13	24.460	0.3456	+64	22	5.91	1.198
δ Sagittarii . . .	2.8	18	15	33.142	+ 3.8406	−29	51	55.00	+1.326
η Serpentis . . .	3.4	18	16	54.642	3.1028	− 2	55	18.03	0.786
ε Sagittarii . . .	2.0	18	18	31.792	+ 3.9815	−34	25	32.56	+1.497

α Herculis, var. irreg., 3ᵐ.1–3ᵐ.9, dup. comp. 6ᵐ, 4″.6 s. f.

δ Herculis, binary, comp. 8ᵐ, 12″ s. pr.

ψ Draconis, star 6ᵐ.1, 30″.4 n. f.

70 Ophiuchi, comp. 6ᵐ, 2″.1 s.

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Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
109 Herculis	3.9	18 20 4.529	+ 2.5559	+21 43 48.57	+1.49
α Telescopii	3.8	18 20 40.265	+ 4.4500	−46 0 59.17	1.73
χ Draconis	3.7	18 22 35.509	− 1.0785	+72 41 46.21	1.60
λ Sagittarii	2.9	18 22 43.506	+ 3.7027	−25 28 11.22	1.78
c Serpentis	5.4	18 25 15.552	3.1215	− 2 2 28.12	2.17
1 Aquilæ	4.1	18 30 34.890	+ 3.2646	− 8 18 15.77	+2.35
ζ Pavonis	4.1	18 33 6.395	7.0199	−71 30 9.66	2.72
α Lyræ (*Vega*)	0.1	18 34 3.632	2.0314	+38 42 14.11	3.24
2 Aquilæ	4.7	18 37 37.244	3.2866	− 9 8 5.20	3.27
φ Sagittarii	3.3	18 40 20.767	3.7487	−27 4 44.82	3.59
110 Herculis	4.3	18 42 0.160	+ 2.5803	+20 27 50.89	+3.31
6 Aquilæ	4.5	18 42 39.865	3.1829	− 4 50 22.95	3.6
λ Pavonis	4.4	18 44 20.655	5.5661	−62 17 10.72	3.85
β Lyræ †	*var.*	18 46 56.489	+ 2.2147	+33 15 47.96	4.07
50 Draconis	5.4	18 49 7.425	− 1.9200	+75 20 2.48	4.37
o Draconis †	4.8	18 49 56.954	+ 0.8881	+59 17 3.03	+4.35
σ Sagittarii	2.1	18 49 59.674	3.7201	−26 24 12.19	4.26
θ Serpentis *pr.* †	4.5	18 51 59.617	2.9822	+ 4 5 31.68	4.53
R Lyræ †	*var.*	18 52 44.936	1.8260	+43 50 0.89	4.65
γ Lyræ	3.3	18 55 45.811	2.2435	+32 34 20.08	4.8
ε Aquilæ	4.2	18 55 45.857	+ 2.7221	+14 57 7.23	+4.7
ζ Sagittarii †	2.7	18 57 12.248	3.8179	−30 0 10.14	4.9
ζ Aquilæ	3.0	19 1 30.184	2.7569	+13 44 10.69	5.21
λ Aquilæ	3.6	19 1 44.284	3.1836	− 5 0 38.72	5.29
α Coronæ Australis	4.1	19 3 41.391	4.0832	−38 2 17.11	5.38
ι Lyræ	5.1	19 4 16.137	+ 2.1412	+35 57 58.48	+5.54
π Sagittarii	3.0	19 4 42.575	+ 3.5689	−21 9 34.72	5.54
λ Ursæ Minoris	6.6	19 5 3.27*	−71.5931	+89 0 51.13	5.60
ψ Sagittarii	4.9	19 10 19.768	+ 3.6802	−25 24 15.01	6.00
δ Draconis	3.2	19 12 32.370	0.0223	+67 30 43.19	6.32
d Sagittarii	5.0	19 12 39.736	+ 3.5110	−19 6 18.35	+6.23
θ Lyræ	4.5	19 13 25.026	2.0808	+37 58 54.54	6.31
ω Aquilæ	5.1	19 13 49.604	2.8159	+11 26 28.76	6.36
κ Cygni	4.0	19 15 8.354	+ 1.3879	+53 12 40.35	6.57
τ Draconis	4.6	19 17 11.809	− 1.1356	+73 11 52.90	6.73
δ Aquilæ	3.4	19 21 12.769	+ 3.0249	+ 2 56 40.13	+7.03
σ Octantis	5.5	19 24 31.66*	95.7707	−89 13 43.28	7.22
β Cygni †	3.2	19 27 17.588	2.4189	+27 46 49.51	7.44
ι Cygni	3.9	19 27 33.809	1.5133	+51 32 53.71	7.60
μ Aquilæ	4.6	19 29 56.251	2.9312	+ 7 11 52.05	7.52
h Sagittarii	4.7	19 31 32.153	+ 3.6531	−25 4 19.74	+7.76
κ Aquilæ	5.0	19 32 19.180	3.2288	− 7 13 1.86	7.86
θ Cygni	4.6	19 34 9.746	1.6089	+50 1 25.54	8.25
54 Sagittarii	5.4	19 35 51.289	3.4387	−16 29 20.51	8.09
β Sagittæ	4.4	19 37 13.855	2.6939	+17 16 42.23	8.22
15 Cygni	5.0	19 41 12.705	+ 2.1640	+37 8 54.78	+8.608
f Sagittarii	5.1	19 41 24.292	3.5015	−19 57 58.56	8.494
γ Aquilæ	2.8	19 42 13.113	+ 2.8520	+10 24 19.19	+8.644

β Lyræ, var., 12^d.9, 3^m.4–4^m.1, star 7^m, 46″ s. f.
o Draco., star 7^m.6, 32″.1 n. pr.
θ Serpentis, star 5^m.4, 22″.2 s. f.
R Lyræ, var., 46^d.4, 4^m.0–4^m.7
ζ Sag., binary, 3^m.4, 3^m.6, 0″.5
β Cygni, star 5^m.4, 34″.7 n. f.

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Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation.
		h m s	s	° ′ ″	″
δ Cygni †	3.0	19 42 19.145	+1.8760	+44 55 21.83	+ 8.699
δ Sagittæ	3.8	19 43 35.865	2.6748	+18 19 26.06	8.773
α Aquilæ (*Altair*)	0.9	19 46 38.170	2.9271	+ 8 38 34.84	9.372
η Aquilæ †	*var.*	19 48 8.606	+3.0568	+ 0 47 12.13	9.104
ε Draconis †	4.0	19 48 28.126	−0.1876	+70 3 5.07	9.164
ι Sagittarii	4.2	19 49 23.926	+4.1432	−42 5 33.21	+ 9.254
ε Pavonis	4.1	19 50 46.736	6.9873	−73 8 10.08	9.197
β Aquilæ	3.9	19 51 8.281	2.9468	+ 6 11 37.35	8.863
γ Sagittæ	3.7	19 54 58.596	2.6673	+19 15 38.11	9.665
c Sagittarii	4.6	19 57 26.021	3.6929	−27 56 49.34	9.841
τ Aquilæ	5.6	19 59 59.274	+2.9308	+ 7 2 15.26	+10.051
θ Aquilæ	3.4	20 6 55.179	3.0960	− 1 4 27.58	10.548
ο Cygni *seq.* †	4.0	20 10 57.352	+1.8901	+46 28 59.01	10.846
κ Cephei †	4.4	20 11 46.465	−1.9653	+77 27 21.33	10.927
4 Vulpeculæ	5.4	20 13 8.874	+2.5673	+24 24 31.02	10.990
α² Capricorni †	3.8	20 13 20.385	+3.3304	−12 48 32.60	+11.024
β Capricorni †	3.2	20 16 14.253	3.3734	−15 3 1.97	11.233
α Pavonis	2.1	20 18 55.811	4.7643	−57 0 30.54	11.329
γ Cygni	2.3	20 19 10.642	2.1526	+39 59 2.59	11.439
π Capricorni †	5.2	20 22 27.442	3.4363	−18 29 27.63	11.671
ρ Capricorni †	5.0	20 24 0.841	+3.4246	−18 5 43.55	+11.763
1 Cygni	4.1	20 25 55.395	2.4516	+30 5 3.65	11.916
θ Cephei	4.3	20 28 9.493	1.0117	+62 42 29.13	12.057
ε Delphini	4.0	20 29 9.144	+2.8664	+11 0 49.16	12.119
Groombridge 3241	6.4	20 30 23.002	−0.2387	+72 14 37.57	12.211
α Indi	3.2	20 31 35.501	+4.2298	−47 35 19.98	+12.366
β Delphini †	3.7	20 33 33.826	2.8138	+14 17 55.61	12.414
υ Capricorni	5.3	20 35 12.769	3.4181	−18 26 18.57	12.555
α Delphini	3.9	20 35 41.414	2.7868	+15 36 42.38	12.611
β Pavonis	3.6	20 37 18.797	5.4432	−66 30 35.31	12.701
α Cygni (*Deneb*)	1.3	20 38 32.029	+2.0447	+44 58 33.82	+12.784
δ Delphini	4.5	20 39 29.443	2.8008	+14 46 7.98	12.801
ψ Capricorni	4.3	20 41 3.938	3.5566	−25 34 36.81	12.808
γ Delphini *seq.* †	4.5	20 42 42.881	2.7832	+15 49 2.44	12.870
ε Cygni	2.6	20 42 46.314	2.4275	+33 39 4.68	13.396
ε Aquarii	3.8	20 43 4.555	+3.2493	− 9 48 27.29	+13.060
η Cephei	3.6	20 43 33.778	1.2245	+61 30 30.14	13.942
μ Aquarii	4.8	20 48 4.231	3.2378	− 9 18 10.94	13.379
β Indi	3.7	20 48 10.556	+4.7115	−58 46 31.82	13.416
76 Draconis	5.7	20 48 48.820	−4.1574	+82 13 2.89	13.491
32 Vulpeculæ	5.2	20 50 56.225	+2.5563	+27 44 1.69	+13.607
20 Draconis (Heis)	5.6	20 51 28.984	−2.6283	+80 14 3.12	13.613
ν Cygni	4.0	20 54 0.218	+2.2356	+40 50 21.60	13.781
α Octantis	5.2	20 54 27.658	7.3824	−77 20 58.34	13.438
γ Microscopii	4.7	20 56 4.887	3.6866	−32 35 26.42	13.926
θ Capricorni	4.2	21 1 10.251	+3.3754	−17 34 16.91	+14.180
ξ Cygni	3.9	21 1 50.312	2.1813	+43 35 18.07	14.296
61 Cygni *pr.*	5.6	21 3 5.095	+2.6853	+38 19 50.90	+17.612

Cygni, comp. 8^{m}, $1''.6$ n. pr.
Aquilæ, var., $7^{d}.18$, $3^{m}.7$–$4^{m}.4$
Draconis, comp. $7^{m}.6$, $3''.1$ n.
Cygni, star $5^{m}.0$ pr. 19^{s}, $270''$ n., star $7^{m}.8$ f. 1^{s}, $96''$ s.

κ Cephei, comp. 8^{m}, $7''.5$ s. f.
α² Capricor., α¹ Capricor. $4^{m}.6$ pr. 24^{s}, $137''$ n.
β Capricor., star $6^{m}.2$ pr. 14^{s}, $10''$ s.

π Capricor., comp. 9^{m}, $3''.4$ s. f.
ρ Capricor., comp. $7^{m}.6$, $2''.8$ s.
β Delphini, binary $4^{m}.1$, $5^{m}.4$, $0''.5$
γ Delphini, comp. $5^{m}.5$, $11''.2$ pr.

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Name of Star.	Magnitude.	Right Ascension.	Annual Variation.	Declination.	Annual Variation
		h m s	s	° ′ ″	″
61 Cygni *seq.*	6.3	Δα + 1.553	. . . .	Δδ − 16.26	. . .
ν Aquarii	4.5	21 4 57.907	+ 3.2700	−11 42 58.97	+14.47
Bradley 2777	5.9	21 7 13.487	− 1.1414	+77 46 54.83	14.6
3 Piscis Australis	5.6	21 8 15.080	+ 3.5634	−27 57 59.99	14.56
ζ Cygni	3.4	21 9 19.072	2.5521	+29 52 39.67	14.67
τ Cygni †	3.8	21 11 23.848	+ 2.3940	+37 40 55.52	+15.2
α Equulei	4.1	21 11 34.507	2.9992	+ 4 53 45.02	14.78
σ Cygni	4.3	21 14 4.592	2.3548	+39 2 17.08	15.0
θ¹ Microscopii	4.9	21 15 19.599	3.8447	−41 10 10.24	15.0
α Cephei	2.6	21 16 33.153	1.4349	+62 13 30.51	15.2
ι Capricorni	4.3	21 17 30.963	+ 3.3441	−17 11 49.76	+15.21
1 Pegasi	4.2	21 18 9.316	2.7741	+19 26 25.06	15.31
γ Pavonis	4.3	21 19 25.871	5.0008	−65 45 6.49	16.1
ζ Capricorni	3.9	21 21 49.032	3.4303	−22 46 48.36	15.47
g Cygni †	5.3	21 26 18.716	2.2127	+46 9 55.50	15.81
β Aquarii	3.1	21 27 5.123	+ 3.1599	− 5 56 44.59	+15.73
β Cephei †	3.3	21 27 34.161	0.7860	+70 11 14.66	15.77
ξ Aquarii	4.8	21 33 13.698	3.1957	− 8 14 9.39	16.0
74 Cygni	5.1	21 33 32.484	2.4034	+40 1 52.30	16.0
γ Capricorni	3.8	21 35 23.022	3.3272	−17 2 48.24	16.16
λ Octantis †	5.4	21 38 0.495	+ 9.5345	−83 6 39.62	+16.3
ε Pegasi	2.5	21 40 0.661	2.9461	+ 9 29 5.14	16.4
11 Cephei	4.8	21 40 40.840	0.8881	+70 55 11.41	16.5
δ Capricorni	3.0	21 42 21.070	3.3141	−16 30 48.75	16.2
π² Cygni	4.3	21 43 39.110	2.2145	+48 54 57.23	16.6
μ Capricorni	5.2	21 48 39.795	+ 3.2730	−13 57 9.12	+16.8
γ Gruis	3.2	21 48 47.133	3.6412	−37 45 54.84	16.8
16 Pegasi	5.0	21 49 11.625	2.7284	+25 31 29.46	16.87
79 Draconis	6.6	21 51 47.810	0.7188	+73 17 59.98	17.0
ε Indi	4.7	21 56 51.886	4.6096	−57 8 8.91	14.6
20 Pegasi	5.7	21 56 56.871	+ 2.9222	+12 42 44.19	+17.17
α Aquarii	3.2	22 1 25.131	3.0820	− 0 43 59.46	17.4
ι Aquarii	4.4	22 1 50.877	3.2425	−14 16 57.16	17.37
20 Cephei	5.4	22 2 25.475	1.8227	+62 22 14.15	17.51
α Gruis	2.2	22 2 52.890	3.7937	−47 22 24.06	17.31
ι Pegasi	4.0	22 3 3.194	+ 2.7915	+24 55 46.17	+17.51
θ Pegasi	3.7	22 5 54.752	3.0267	+ 5 46 45.54	17.6
π Pegasi	4.4	22 6 12.671	2.6627	+32 45 38.64	17.0
ζ Cephei	3.6	22 7 54.209	2.0781	+57 46 55.24	17.70
24 Cephei	5.0	22 8 10.570	1.1577	+71 55 20.20	17.71
θ Aquarii	4.3	22 12 20.960	+ 3.1672	− 8 12 24.85	+17.85
α Tucanæ	2.9	22 12 41.227	4.1348	−60 41 0.76	17.85
υ Octantis	5.7	22 15 43.98*	12.3687	−86 24 3.31	18.08
γ Aquarii	4.0	22 17 15.987	3.0991	− 1 48 57.39	18.08
31 Pegasi	4.9	22 17 20.054	2.9530	+11 46 35.35	18.07
3 Lacertæ	4.6	22 20 12.924	+ 2.3556	+51 48 10.39	+17.98
π Aquarii	4.6	22 20 56.163	3.0638	+ 0 56 44.29	18.20
σ Aquarii	4.9	22 26 9.036	+ 3.1771	−11 6 47.60	+18.36

τ Cygni, comp. 7^{m}, 0″.8
g Cygni, star $6^{m}.7$ f. 10^{s}, 420″ s.

β Cephei, star 8^{m}, 13″.3 s. pr.

λ Octantis, binary, $5^{m}.5$, $8^{m}.0$, 3″.2 n.

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Name of Star.	Magnitude.	Right Ascension.			Annual Variation.	Declination.			Annual Variation.
		h	m	s	s	°	′	″	″
α Lacertæ . . .	3.8	22	27	47.263	+2.4680	+49	50	42.51	+18.458
υ Aquarii . . .	5.3	22	30	2.730	3.2851	−21	8	38.83	18.367
6 B. Cephei . .	5.7	22	30	47.103	1.0648	+75	47	17.92	18.546
η Aquarii . . .	4.1	22	30	59.337	3.0832	− 0	33	21.30	18.500
o Lacertæ . . .	4.9	22	35	26.725	2.6889	+38	36	27.07	18.685
ε Piscis Australis .	4.2	22	35	57.401	+3.3227	−27	29	14.91	+18.702
ζ Pegasi . . .	3.6	22	37	13.343	2.9914	+10	23	14.19	18.738
β Octantis . . .	4.3	22	37	26.383	6.3226	−81	49	39.87	18.761
β Gruis . . .	2.2	22	37	35.848	3.5960	−47	19	46.45	18.737
η Pegasi . . .	3.1	22	39	0.947	2.8092	+29	46	34.51	18.770
λ Pegasi . . .	4.1	22	42	26.109	+2.8869	+23	7	4.97	+18.899
ε Gruis . . .	3.7	22	43	25.560	3.6381	−51	45	50.53	18.878
τ Aquarii . . .	4.2	22	45	5.599	3.1791	−14	2	29.33	18.952
μ Pegasi . . .	3.7	22	45	53.962	2.8932	+24	9	8.89	18.965
ι Cephei . . .	3.7	22	46	39.052	2.1281	+65	45	11.17	18.902
λ Aquarii . . .	3.8	22	48	10.851	+3.1309	− 8	1	55.91	+19.104
ρ Indi . . .	6.1	22	48	45.522	4.2154	−70	31	41.31	19.138
δ Aquarii . . .	3.5	22	50	8.435	3.1863	−16	16	23.30	19.096
α Pisc. Aust. (*Fomalhaut*)	1.3	22	52	57.408	3.3209	−30	4	23.03	19.023
o Andromedæ . .	3.6	22	58	0.406	2.7546	+41	52	8.08	19.307
β Pegasi . . . †	*var.*	22	59	39.097	+2.9052	+27	37	17.25	+19.490
α Pegasi . (*Markab*)	2.6	23	0	31.530	2.9864	+14	44	51.74	19.335
55 Pegasi . . .	4.7	23	2	43.301	3.0209	+ 8	57	0.14	19.411
c^2 Aquarii . . .	3.8	23	4	54.972	3.2020	−21	38	2.67	19.510
π Cephei . . . †	4.6	23	5	11.435	1.8994	+74	55	40.18	19.443
ι Gruis . . .	4.1	23	5	33.109	+3.4071	−45	42	26.60	+19.452
59 Pegasi . . .	5.2	23	7	26.665	3.0278	+ 8	15	30.12	19.525
5 Cassiopeiæ (Heis) .	5.6	23	9	11.138	2.8787	+56	41	56.28	19.853
φ Aquarii . . .	4.4	23	9	55.235	3.1072	− 6	30	26.81	19.374
ψ Aquarii . . . †	4.5	23	11	26.377	3.1448	− 9	33	3.17	19.592
γ Tucanæ . . .	4.1	23	12	28.514	+3.5195	−58	42	8.12	+19.676
γ Piscium . . .	3.8	23	12	45.512	3.1094	+ 2	49	3.66	19.642
γ Sculptoris . .	4.5	23	14	14.195	3.2449	−32	59	43.05	19.581
o Cephei . . . †	4.9	23	15	7.766	2.4517	+67	38	46.70	19.680
τ Pegasi . . .	4.6	23	16	25.654	2.9658	+23	16	29.52	19.673
b^1 Aquarii . . .	4.2	23	18	30.455	+3.1530	−20	33	53.33	+19.628
4 Cassiopeiæ . .	5.2	23	21	3.291	2.6504	+61	48	57.70	19.747
υ Pegasi . . .	4.6	23	21	8.086	2.9906	+22	56	9.35	19.788
κ Piscium . . .	4.9	23	22	34.509	3.0752	+ 0	47	24.69	19.686
θ Piscium . . .	4.4	23	23	39.334	3.0420	+ 5	54	43.24	19.753
70 Pegasi . . .	4.7	23	24	51.274	+3.0321	+12	17	29.41	+19.846
39 H. Cephei . .	5.6	23	27	44.653	−0.2579	+86	50	19.16	19.867
β Sculptoris . .	4.5	23	28	25.007	+3.2247	−38	17	19.13	19.861
72 Pegasi (*mean*) . . †	5.2	23	29	43.986	2.9709	+30	51	22.14	19.862
λ Andromedæ . .	4.0	23	33	23.972	2.9282	+45	59	51.23	19.491
ι Andromedæ . .	4.3	23	33	57.797	+2.9348	+42	47	50.73	+19.916
ι Piscium . . .	4.3	23	35	34.656	3.0844	+ 5	9	55.78	19.496
γ Cephei . . .	3.4	23	35	50.979	+2.4387	+77	9	28.64	+20.092

β Pegasi, var. irreg., $2^m.2$–$2^m.7$
π Cephei, comp. 7^m, 0″.9 f.

ψ Aquarii, star $8^m.5$, 49″.4 n. pr.
o Cephei, comp. 8^m, 2″.9 s. pr.

72 Pegasi, $6^m.0$, $6^m.0$, 0″.4

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Name of Star.	Magnitude	Right Ascension.	Annual Variation.	Declination.	Annual Variatio
		h m s	s	° ′ ″	″
κ Andromedæ	4.3	23 36 13.039	+ 2.9474	+43 51 47.31	+19.91
ω² Aquarii	4.6	23 38 18.918	3.1127	−15 0 53.55	19.89
ι¹ Aquarii	5.3	23 39 47.668	3.1145	−18 44 55.85	19.96
ψ Andromedæ	5.1	23 41 49.039	2.9637	+45 56 53.64	19.97
41 H. Cephei	5.0	23 43 50.271	2.8495	+67 20 3.92	19.98
δ Sculptoris	4.6	23 44 29.985	+ 3.1278	−28 36 2.61	+19.86
γ¹ Octantis	5.1	23 47 9.199	3.6160	−82 29 28.43	20.00
φ Pegasi	5.2	23 48 9.684	3.0480	+18 38 53.44	19.98
ρ Cassiopeiæ	4.8	23 50 7.747	2.9817	+57 1 35.42	20.02
Groombridge 4163	6.6	23 50 40.703	2.8799	+73 56 14.18	20.02
ω Piscium	4.0	23 54 56.738	+ 3.0795	+ 6 23 34.05	+19.93
ε Tucanæ	4.7	23 55 30.465	3.1392	−66 2 59.09	20.03
30 Piscium	4.7	23 57 36.059	3.0772	− 6 29 11.22	20.00
2 Ceti	4.6	23 59 23.188	+ 3.0752	−17 48 33.28	+20.03

NORTHERN CIRCUMPOLARS.

Name of Star.	Magnitude	Right Ascension.	Annual Variation.	Declination.	Annual Variatio
43 H. Cephei	4.5	0 56 54.030	+ 7.6192	+85 48 6.45	+19.427
α Ursæ Minoris (*Polaris*)	2.1	1 29 15.60*	28.5356	+88 51 6.49	18.547
Groombridge 750	6.7	4 9 27.362	17.5817	+85 19 51.71	9.34
Groombridge 944	6.4	5 34 35.250	18.7618	+85 9 25.87	+ 2.214
51 H. Cephei	5.3	7 1 5.64*	29.2318	+87 11 5.45	− 5.315
Groombridge 1119	7.0	8 13 47.916	+60.5580	+88 53 22.50	−11.03
1 H. Draconis	4.6	9 25 4.133	8.8008	+81 42 12.85	15.66
30 H. Camelopardalis	5.3	10 20 49.679	7.5850	+82 59 30.46	18.18
Bradley 1672	6.3	12 14 27.688	+ 0.3615	+88 10 15.98	19.947
Groombridge 2283	7.2	15 4 20.10*	−19.5312	+87 33 38.31	13.873
ε Ursæ Minoris	4.4	16 54 37.997	− 6.2577	+82 10 44.05	− 5.641
δ Ursæ Minoris	4.4	17 59 40.30*	19.4981	+86 36 51.19	+ 0.019
λ Ursæ Minoris	6.6	19 5 3.27*	71.5931	+89 0 51.13	5.60
76 Draconis	5.7	20 48 48.820	4.1574	+82 13 2.89	13.49
39 H. Cephei	5.6	23 27 44.653	− 0.2579	+86 50 19.16	+19.867

SOUTHERN CIRCUMPOLARS.

Name of Star.	Magnitude	Right Ascension.	Annual Variation.	Declination.	Annual Variatio
4 Octantis (G.)	5.6	1 42 9.88*	− 3.7794	−85 11 57.70	+18.114
31 Mensæ (G.)	6.2	5 46 38.12*	11.6858	−84 49 49.43	+ 1.255
7 Octantis (G.)	6.4	7 17 0.79*	20.2238	−86 53 53.55	− 6.604
ζ Octantis	5.4	9 9 14.21*	8.1212	−85 19 28.08	14.691
η Octantis	6.3	10 59 56.00*	− 0.3564	−84 8 11.87	19.366
ι Octantis	5.4	12 45 55.22*	+ 5.9557	−84 39 43.10	−19.621
δ Octantis	4.1	14 13 9.28*	9.2466	−83 16 47.50	−16.771
χ Octantis	5.2	18 5 0.43*	35.7348	−87 39 52.55	+ 0.312
σ Octantis	5.5	19 24 31.66*	95.7707	−89 13 43.28	7.226
υ Octantis	5.7	22 15 43.98*	+12.3687	−86 24 3.31	+18.081

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			*α* **Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
an lar te.	**Right Ascension.**	**Declination** ***North.***	**Mean Solar Date.**	**Right Ascension.**	**Declination** ***North.***	**Mean Solar Date.**	**Right Ascension.**	**Declination** ***North.***	**Mean Solar Date.**	**Right Ascension.**	**Declination** ***North.***	**Mean Solar Date.**	**Right Ascension.**	**Declination** ***North.***
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
m.	0 56	+85 48	Jan.	1 28	+88 51	Jan.	4 9	+85 20	Jan.	5 34	+85 9	Jan.	7 1	+87 11
	s	″		s	″		s	″		s	″		s	″
0.3	50.82	31.88	0.3	74.39	32.38	0.4	41.25	11.77	0.5	53.58	38.68	0.5	41.08	9.11
1.3	50.53	32.01	1.3	73.39	32.55	1.4	41.17	12.10	1.5	53.60	39.02	1.5	41.28	9.43
2.3	50.22	32.12	2.3	72.33	32.72	2.4	41.07	12.42	2.5	53.59	39.38	2.5	41.47	9.78
3.3	49.89	32.21	3.3	71.19	32.88	3.4	40.94	12.74	3.4	53.58	39.74	3.5	41.62	10.14
4.3	49.57	32.28	4.3	70.02	33.01	4.4	40.80	13.06	4.4	53.55	40.09	4.5	41.74	10.49
5.2	49.25	32.32	5.3	68.84	33.11	5.4	40.65	13.35	5.4	53.49	40.44	5.5	41.83	10.85
6.2	48.94	32.34	6.3	67.70	33.18	6.4	40.48	13.61	6.4	53.43	40.76	6.5	41.88	11.19
7.2	48.65	32.35	7.3	66.62	33.23	7.4	40.32	13.85	7.4	53.35	41.06	7.5	41.92	11.51
8.2	48.39	32.34	8.3	65.63	33.28	8.4	40.16	14.07	8.4	53.29	41.32	8.5	41.94	11.80
9.2	48.15	32.34	9.3	64.71	33.33	9.4	40.03	14.28	9.4	53.24	41.57	9.5	41.98	12.07
0.2	47.91	32.36	10.3	63.84	33.39	10.4	39.92	14.49	10.4	53.19	41.83	10.5	42.04	12.33
1.2	47.67	32.39	11.3	62.98	33.47	11.4	39.81	14.71	11.4	53.16	42.08	11.5	42.13	12.60
2.2	47.42	32.44	12.3	62.08	33.57	12.4	39.70	14.95	12.4	53.14	42.36	12.5	42.23	12.88
3.2	47.16	32.50	13.3	61.11	33.68	13.4	39.58	15.21	13.4	53.11	42.66	13.5	42.34	13.18
4.2	46.87	32.56	14.2	60.06	33.78	14.4	39.44	15.49	14.4	53.07	42.98	14.5	42.44	13.50
5.2	46.56	32.60	15.2	58.93	33.88	15.4	39.28	15.77	15.4	53.02	43.32	15.5	42.52	13.85
6.2	46.23	32.61	16.2	57.73	33.95	16.4	39.11	16.04	16.4	52.94	43.66	16.5	42.56	14.22
7.2	45.90	32.60	17.2	56.51	33.99	17.4	38.92	16.30	17.4	52.84	43.99	17.5	42.57	14.59
8.2	45.58	32.55	18.2	55.30	34.00	18.3	38.71	16.54	18.4	52.72	44.31	18.5	42.54	14.94
9.2	45.28	32.48	19.2	54.12	33.99	19.3	38.49	16.75	19.4	52.60	44.60	19.5	42.48	15.27
20.2	44.99	32.40	20.2	53.01	33.96	20.3	38.28	16.93	20.4	52.46	44.87	20.5	42.40	15.59
21.2	44.72	32.32	21.2	51.97	33.92	21.3	38.07	17.10	21.4	52.34	45.12	21.5	42.31	15.88
22.2	44.46	32.22	22.2	50.98	33.88	22.3	37.88	17.25	22.4	52.20	45.35	22.5	42.22	16.17
23.2	44.21	32.14	23.2	50.02	33.84	23.3	37.69	17.40	23.4	52.08	45.58	23.5	42.14	16.44
24.2	43.97	32.06	24.2	49.08	33.81	24.3	37.51	17.55	24.4	51.96	45.80	24.5	42.07	16.71
25.2	43.74	32.00	25.2	48.15	33.79	25.3	37.33	17.71	25.4	51.86	46.03	25.4	42.01	16.98
26.2	43.49	31.94	26.2	47.21	33.78	26.3	37.16	17.88	26.4	51.76	46.27	26.4	41.97	17.27
27.2	43.24	31.89	27.2	46.22	33.78	27.3	36.98	18.05	27.4	51.65	46.52	27.4	41.92	17.57
28.2	42.96	31.83	28.2	45.18	33.77	28,3	36.79	18.25	28.4	51.54	46.79	28.4	41.87	17.87
29.2	42.68	31.77	29.2	44.09	33.76	29.3	36.59	18.45	29.4	51.42	47.06	29.4	41.82	18.20
30.2	42.37	31.70	30.2	42.94	33.74	30.3	36.38	18.65	30.4	51.28	47.34	30.4	41.74	18.53
31.2	42.07	31.60	31.2	41.75	33.70	31.3	36.14	18.84	31.4	51.13	47.63	31.4	41.64	18.88
	13.68	+13.65		50.24	+50.23		12.30	+12.26		11.86	+11.81		20.38	+20.35
	$0^h\ 56^m$	$54^s.030$		$1^h\ 29^m$	$15^s.60$		$4^h\ 9^m$	$27^s.362$		$5^h\ 34^m$	$35^s.250$		$7^h\ 1^m$	$5^s.64$
	+85° 48′	6″.45		+88° 51′	6″.49		+85° 19′	51″.71		+85° 9′	25″.87		+87° 11′	5″.45

[Eph 15]

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	De nati *No*
	h m	° ′		h m	° ′		h m	°		h m	° ′		h m	°
Feb.	0 56	+85 48	Feb.	1 28	+88 51	Feb.	4 9	+85 20	Feb.	5 34	+85 9	Feb.	7 1	+87
	s	″		s	″		s	″		s	″		s	″
0.2	42.07	31.60	0.2	41.75	33.70	0.3	36.14	18.84	0.4	51.13	47.63	0.4	41.64	18.
1.2	41.76	31.48	1.2	40.56	33.64	1.3	35.88	19.01	1.4	50.96	47.90	1.4	41.49	19.
2.2	41.47	31.34	2.2	39.40	33.54	2.3	35.63	19.14	2.4	50.77	48.15	2.4	41.31	19.
3.2	41.20	31.17	3.2	38.31	33.42	3.3	35.38	19.26	3.4	50.57	48.37	3.4	41.11	19.
4.2	40.95	30.99	4.2	37.30	33.30	4.3	35.13	19.35	4.4	50.38	48.56	4.4	40.90	20.
5.2	40.72	30.82	5.2	36.38	33.17	5.3	34.89	19.42	5.4	50.20	48.73	5.4	40.69	20.
6.2	40.51	30.65	6.2	35.54	33.04	6.3	34.68	19.49	6.4	50.03	48.88	6.4	40.50	20.
7.2	40.32	30.51	7.2	34.73	32.93	7.3	34.48	19.56	7.4	49.87	49.04	7.4	40.33	20.
8.2	40.12	30.38	8.2	33.91	32.84	8.3	34.29	19.64	8.3	49.72	49.21	8.4	40.18	21.
9.2	39.90	30.27	9.2	33.06	32.76	9.3	34.10	19.75	9.3	49.59	49.40	9.4	40.05	21.
10.2	39.67	30.15	10.2	32.13	32.69	10.3	33.89	19.87	10.3	49.44	49.60	10.4	39.92	21.
11.1	39.41	30.03	11.2	31.11	32.61	11.3	33.66	20.00	11.3	49.27	49.83	11.4	39.77	21.
12.1	39.14	29.89	12.2	30.04	32.51	12.3	33.42	20.13	12.3	49.09	50.06	12.4	39.59	22.
13.1	38.87	29.72	13.2	28.96	32.39	13.3	33.16	20.25	13.3	48.89	50.28	13.4	39.37	22.
14.1	38.60	29.52	14.2	27.87	32.25	14.3	32.88	20.34	14.3	48.67	50.49	14.4	39.12	22.
15.1	38.35	29.31	15.2	26.82	32.08	15.3	32.60	20.40	15.3	48.44	50.68	15.4	38.84	23.
16.1	38.12	29.07	16.2	25.84	31.88	16.3	32.33	20.43	16.3	48.21	50.84	16.4	38.55	23.
17.1	37.90	28.82	17.2	24.93	31.67	17.3	32.05	20.45	17.3	47.97	50.97	17.4	38.24	23.
18.1	37.71	28.58	18.2	24.10	31.46	18.3	31.79	20.44	18.3	47.73	51.08	18.4	37.93	23.
19.1	37.53	28.34	19.1	23.33	31.26	19.3	31.55	20.43	19.3	47.51	51.18	19.4	37.62	23.
20.1	37.36	28.12	20.1	22.59	31.06	20.3	31.32	20.42	20.3	47.30	51.28	20.4	37.33	24.
21.1	37.20	27.89	21.1	21.88	30.87	21.3	31.09	20.41	21.3	47.09	51.37	21.4	37.05	24.
22.1	37.03	27.68	22.1	21.15	30.69	22.3	30.86	20.41	22.3	46.89	51.47	22.4	36.78	24.
23.1	36.86	27.47	23.1	20.41	30.52	23.2	30.64	20.42	23.3	46.70	51.58	23.4	36.53	24.
24.1	36.67	27.28	24.1	19.64	30.36	24.2	30.41	20.45	24.3	46.51	51.70	24.4	36.28	24.
25.1	36.48	27.08	25.1	18.82	30.19	25.2	30.18	20.48	25.3	46.31	51.84	25.4	36.02	25.
26.1	36.27	26.87	26.1	17.96	30.01	26.2	29.93	20.51	26.3	46.10	51.98	26.4	35.75	25.
27.1	36.05	26.64	27.1	17.06	29.82	27.2	29.67	20.53	27.3	45.87	52.13	27.4	35.45	25.
28.1	35.84	26.39	28.1	16.15	29.61	28.2	29.39	20.55	28.3	45.63	52.26	28.4	35.13	25.
29.1	35.64	26.12	29.1	15.28	29.38	29.2	29.11	20.53	29.3	45.37	52.37	29.4	34.77	26.
30.1	35.46	25.83	30.1	14.46	29.12	30.2	28.82	20.49	30.3	45.11	52.46	30.3	34.39	26.
31.1	35.31	25.52	31.1	13.73	28.85	31.2	28.55	20.42	31.3	44.85	52.51	31.3	33.99	26.

43 H. Cephei.		α Ursæ Minoris.		Groombridge 750.		Groombridge 944.		51 H. Cephei.	
13.68	+13.64	50.21	+50.20	12.31	+12.27	11.86	+11.82	20.40	+20.3
0h 56m	54s.030	1h 29m	15s.60	4h 9m	27s.362	5h 34m	35s.250	7h 1m	5s.6
+85° 48′	6″.45	+88° 51′	6″.49	+85° 19′	51″.71	+85° 9′	25″.87	+87° 11′	5″.4

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
ean lar ate.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
ar.	0 56	+85 48	Mar.	1 28	+88 51	Mar.	4 9	+85 20	Mar.	5 34	+85 9	Mar.	7 1	+87 11
	s	″		s	″		s	″		s	″		s	″
0.1	35.84	26.39	0.1	16.15	29.61	0.2	29.39	20.55	0.3	45.63	52.26	0.4	35.13	25.92
1.1	35.64	26.12	1.1	15.28	29.38	1.2	29.11	20.53	1.3	45.37	52.37	1.4	34.77	26.15
2.1	35.46	25.83	2.1	14.46	29.12	2.2	28.82	20.49	2.3	45.11	52.46	2.3	34.39	26.36
3.1	35.31	25.52	3.1	13.73	28.85	3.2	28.55	20.42	3.3	44.85	52.51	3.3	33.99	26.54
4.1	35.18	25.22	4.1	13.10	28.57	4.2	28.29	20.32	4.3	44.60	52.54	4.3	33.59	26.68
5.1	35.07	24.93	5.1	12.57	28.30	5.2	28.06	20.21	5.3	44.35	52.55	5.3	33.21	26.81
6.1	34.98	24.66	6.1	12.09	28.04	6.2	27.85	20.11	6.3	44.13	52.55	6.3	32.86	26.92
7.1	34.88	24.41	7.1	11.63	27.80	7.2	27.64	20.01	7.3	43.93	52.56	7.3	32.53	27.03
8.1	34.79	24.17	8.1	11.15	27.58	8.2	27.44	19.94	8.3	43.73	52.58	8.3	32.23	27.15
9.1	34.68	23.94	9.1	10.62	27.38	9.2	27.24	19.89	9.3	43.53	52.63	9.3	31.92	27.29
0.1	34.55	23.71	10.1	10.02	27.17	10.2	27.02	19.85	10.3	43.32	52.70	10.3	31.62	27.45
1.1	34.40	23.47	11.1	9.35	26.95	11.2	26.78	19.81	11.3	43.09	52.76	11.3	31.30	27.62
2.1	34.24	23.20	12.1	8.65	26.71	12.2	26.52	19.76	12.3	42.85	52.83	12.3	30.94	27.80
3.1	34.09	22.91	13.1	7.96	26.45	13.2	26.25	19.70	13.3	42.59	52.89	13.3	30.55	27.98
4.1	33.95	22.60	14.1	7.31	26.16	14.2	25.99	19.60	14.3	42.32	52.92	14.3	30.13	28.14
5.1	33.84	22.27	15.1	6.72	25.85	15.2	25.72	19.48	15.3	42.05	52.93	15.3	29.69	28.27
6.1	33.75	21.93	16.1	6.21	25.53	16.2	25.46	19.33	16.3	41.78	52.91	16.3	29.24	28.38
7.1	33.68	21.59	17.1	5.78	25.21	17.2	25.22	19.17	17.2	41.51	52.87	17.3	28.79	28.46
8.1	33.63	21.26	18.1	5.43	24.89	18.2	24.99	19.00	18.2	41.26	52.81	18.3	28.35	28.53
9.0	33.59	20.94	19.1	5.13	24.58	19.2	24.77	18.82	19.2	41.02	52.73	19.3	27.92	28.58
0.0	33.56	20.63	20.1	4.86	24.28	20.2	24.57	18.65	20.2	40.78	52.67	20.3	27.52	28.63
1.0	33.53	20.34	21.1	4.60	24.00	21.2	24.38	18.49	21.2	40.56	52.60	21.3	27.13	28.67
2.0	33.49	20.06	22.1	4.33	23.73	22.2	24.19	18.33	22.2	40.34	52.55	22.3	26.76	28.72
3.0	33.45	19.79	23.1	4.05	23.46	23.2	24.00	18.19	23.2	40.13	52.49	23.3	26.40	28.78
4.0	33.40	19.52	24.1	3.73	23.20	24.2	23.80	18.06	24.2	39.92	52.46	24.3	26.03	28.86
5.0	33.34	19.25	25.1	3.37	22.94	25.2	23.60	17.93	25.2	39.71	52.44	25.3	25.67	28.94
6.0	33.28	18.97	26.1	2.97	22.67	26.2	23.39	17.80	26.2	39.48	52.41	26.3	25.29	29.03
7.0	33.20	18.67	27.0	2.56	22.38	27.2	23.17	17.66	27.2	39.24	52.39	27.3	24.89	29.12
28.0	33.14	18.35	28.0	2.18	22.08	28.2	22.94	17.51	28.2	38.99	52.34	28.3	24.45	29.20
29.0	33.09	18.01	29.0	1.84	21.75	29.2	22.71	17.32	29.2	38.73	52.27	29.3	23.99	29.26
30.0	33.07	17.66	30.0	1.59	21.41	30.2	22.49	17.11	30.2	38.47	52.17	30.3	23.52	29.28
31.0	33.09	17.31	31.0	1.44	21.07	31.2	22.28	16.87	31.2	38.22	52.05	31.3	23.06	29.29
	13.67	+13.64		50.14	+50.13		12.31	+12.27		11.86	+11.82		20.41	+20.38
	$0^h\ 56^m$	$54^s.030$		$1^h\ 29^m$	$15^s.60$		$4^h\ 9^m$	$27^s.362$		$5^h\ 34^m$	$35^s.250$		$7^h\ 1^m$	$5^s.64$
	85° 48′	6″.45		+88° 51′	6″.49		+85° 19′	51″.71		+85° 9′	25″.87		+87° 11′	5″.45

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			*α* **Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
Mean Solar Date.	**Right Ascension.**	**Declination** *North.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *North.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *North.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *North.*	**Mean Solar Date.**	**Right Ascension.**	**De nati** *Nor*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Apr.	0 56	+85 48	Apr.	1 28	+88 51	Apr.	4 9	+85 20	Apr.	5 34	+85 9	Apr.	7 1	+87
	s	″		s	″		s	″		s	″		s	″
0.0	33.09	17.31	0.0	1.44	21.07	0.2	22.28	16.87	0.2	38.22	52.05	0.3	23.06	29.
1.0	33.12	16.97	1.0	1.38	20.73	1.1	22.09	16.62	1.2	37.98	51.91	1.3	22.61	29.
2.0	33.17	16.65	2.0	1.42	20.41	2.1	21.93	16.38	2.2	37.76	51.74	2.3	22.18	29.
3.0	33.24	16.35	3.0	1.50	20.10	3.1	21.79	16.14	3.2	37.57	51.59	3.3	21.79	29.
4.0	33.30	16.08	4.0	1.56	19.82	4.1	21.66	15.92	4.2	37.39	51.44	4.3	21.42	29.
5.0	33.35	15.83	5.0	1.59	19.55	5.1	21.53	15.72	5.2	37.21	51.32	5.3	21.07	29.
6.0	33.38	15.57	6.0	1.56	19.29	6.1	21.39	15.53	6.2	37.02	51.22	6.3	20.72	29.
6.9	33.38	15.31	7.0	1.46	19.03	7.1	21.23	15.36	7.2	36.83	51.12	7.3	20.36	29.
7.9	33.38	15.04	8.0	1.31	18.75	8.1	21.07	15.18	8.2	36.63	51.03	8.2	19.99	29.
8.9	33.38	14.75	9.0	1.16	18.46	9.1	20.88	14.99	9.2	36.41	50.94	9.2	19.58	29
9.9	33.40	14.43	10.0	1.03	18.15	10.1	20.70	14.77	10.2	36.18	50.82	10.2	19.14	29
10.9	33.42	14.10	11.0	0.96	17.81	11.1	20.51	14.53	11.2	35.95	50.68	11.2	18.68	29
11.9	33.47	13.76	12.0	0.98	17.46	12.1	20.34	14.27	12.2	35.71	50.51	12.2	18.22	29.
12.9	33.55	13.41	13.0	1.08	17.11	13.1	20.17	13.98	13.2	35.48	50.32	13.2	17.76	28
13.9	33.64	13.08	14.0	1.26	16.76	14.1	20.03	13.69	14.2	35.28	50.12	14.2	17.31	28.
14.9	33.75	12.76	14.9	1.49	16.43	15.1	19.90	13.40	15.2	35.08	49.91	15.2	16.88	28
15.9	33.88	12.46	15.9	1.77	16.10	16.1	19.79	13.10	16.2	34.89	49.68	16.2	16.47	28.
16.9	34.00	12.17	16.9	2.07	15.79	17.1	19.69	12.82	17.2	34.72	49.47	17.2	16.07	28.
17.9	34.12	11.90	17.9	2.36	15.51	18.1	19.59	12.55	18.2	34.56	49.26	18.2	15.71	28.
18.9	34.23	11.64	18.9	2.64	15.23	19.1	19.51	12.30	19.2	34.41	49.07	19.2	15.36	28.
19.9	34.34	11.39	19.9	2.89	14.96	20.1	19.42	12.05	20.2	34.25	48.89	20.2	15.02	28.
20.9	34.44	11.14	20.9	3.10	14.70	21.1	19.33	11.82	21.2	34.10	48.72	21.2	14.68	28.
21.9	34.53	10.89	21.9	3.27	14.44	22.1	19.23	11.59	22.1	33.94	48.55	22.2	14.32	28.
22.9	34.61	10.62	22.9	3.43	14.16	23.1	19.12	11.35	23.1	33.77	48.39	23.2	13.95	27.
23.9	34.69	10.34	23.9	3.59	13.87	24.1	18.99	11.11	24.1	33.59	48.22	24.2	13.57	27
24.9	34.79	10.05	24.9	3.77	13.56	25.1	18.87	10.85	25.1	33.40	48.02	25.2	13.17	27.
25.9	34.91	9.75	25.9	4.03	13.24	26.1	18.76	10.55	26.1	33.21	47.80	26.2	12.75	27.
26.9	35.05	9.44	26.9	4.40	12.91	27.1	18.66	10.24	27.1	33.03	47.55	27.2	12.33	27.
27.9	35.22	9.15	27.9	4.87	12.59	28.1	18.58	9.92	28.1	32.87	47.28	28.2	11.93	27.
28.9	35.42	8.87	28.9	5.42	12.28	29.1	18.53	9.58	29.1	32.73	47.00	29.2	11.55	27.
29.9	35.63	8.62	29.9	6.03	12.00	30.1	18.50	9.25	30.1	32.60	46.71	30.2	11.20	26.
30.9	35.83	8.39	30.9	6.64	11.74	31.1	18.48	8.94	31.1	32.50	46.44	31.2	10.89	26.
	13.66	+13.63		50.02	+50.01		12.30	+12.26		11.86	+11.82		20.41	+20.38
	$0^h\ 56^m$	$54^s.030$		$1^h\ 29^m$	$15^s.60$		$4^h\ 9^m$	$27^s.362$		$5^h\ 34^m$	$35^s.250$		$7^h\ 1^m$	$5^s.64$
	+85° 48′	6″.45		+88° 51′	6″.49		+85° 19′	51″.71		+85° 9′	25″.87		+87° 11′	5″.45

[Eph 15]

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

13 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
an ar te.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
y	0 56	+85 48	May	1 28	+88 51	May	4 9	+85 19	May	5 34	+85 9	May	7 1	+87 11
	s	″		s	″		s	″		s	″		s	″
.9	35.83	8.39	0.9	6.64	11.74	1.1	18.48	68.94	1.1	32.50	46.44	1.2	10.89	26.75
.9	36.03	8.19	1.9	7.24	11.51	2.1	18.48	68.66	2.1	32.41	46.19	2.2	10.61	26.55
.9	36.21	8.00	2.9	7.79	11.29	3.1	18.47	68.39	3.1	32.32	45.95	3.2	10.34	26.38
.9	36.37	7.81	3.9	8.25	11.07	4.1	18.44	68.15	4.1	32.23	45.73	4.2	10.08	26.23
.9	36.51	7.61	4.9	8.65	10.84	5.1	18.40	67.91	5.1	32.12	45.53	5.2	9.80	26.09
.9	36.65	7.40	5.9	9.03	10.60	6.1	18.36	67.67	6.1	32.01	45.33	6.2	9.50	25.96
.9	36.79	7.16	6.9	9.41	10.33	7.0	18.30	67.40	7.1	31.88	45.11	7.2	9.16	25.82
.9	36.95	6.90	7.9	9.84	10.05	8.0	18.23	67.10	8.1	31.74	44.87	8.2	8.80	25.66
.9	37.13	6.64	8.9	10.34	9.76	9.0	18.18	66.79	9.1	31.60	44.61	9.2	8.43	25.48
.9	37.33	6.37	9.9	10.92	9.47	10.0	18.14	66.46	10.1	31.47	44.32	10.2	8.07	25.27
.9	37.56	6.11	10.9	11.58	9.17	11.0	18.12	66.12	11.1	31.34	44.02	11.2	7.72	25.04
.9	3[illegible]80	5.87	11.9	12.30	8.89	12.0	18.12	65.77	12.1	31.24	43.71	12.2	7.40	24.80
.9	38.04	5.65	12.9	13.08	8.63	13.0	18.13	65.43	13.1	31.16	43.39	13.2	7.09	24.54
.9	38.30	5.45	13.9	13.87	8.39	14.0	18.16	65.10	14.1	31.09	43.08	14.1	6.81	24.28
.9	38.55	5.27	14.9	14.66	8.16	15.0	18.20	64.80	15.1	31.03	42.78	15.1	6.56	24.03
.9	38.80	5.10	15.9	15.44	7.95	16.0	18.24	64.50	16.1	30.98	42.49	16.1	6.33	23.79
.9	39.03	4.94	16.9	16.18	7.76	17.0	18.28	64.22	17.1	30.94	42.22	17.1	6.11	23.56
.9	39.25	4.79	17.9	16.89	7.58	18.0	18.31	63.95	18.1	30.89	41.95	18.1	5.89	23.34
.9	39.45	4.63	18.9	17.55	7.39	19.0	18.34	63.69	19.1	30.84	41.70	19.1	5.68	23.13
.9	39.65	4.48	19.9	18.17	7.20	20.0	18.37	63.44	20.1	30.79	41.45	20.1	5.46	22.93
.9	39.85	4.32	20.9	18.78	7.00	21.0	18.38	63.18	21.1	30.72	41.21	21.1	5.22	22.74
.9	40.06	4.14	21.9	19.41	6.79	22.0	18.39	62.90	22.1	30.66	40.95	22.1	4.96	22.53
.9	40.28	3.94	22.9	20.11	6.56	23.0	18.40	62.59	23.1	30.58	40.67	23.1	4.69	22.30
3.9	40.53	3.75	23.9	20.87	6.32	24.0	18.43	62.27	24.1	30.51	40.36	24.1	4.41	22.05
4.9	40.80	3.56	24.9	21.73	6.09	24.9	18.48	61.94	25.1	30.46	40.02	25.1	4.15	21.77
5.9	41.09	3.39	25.9	22.69	5.87	25.9	18.56	61.60	26.1	30.43	39.68	26.1	3.92	21.46
6.9	41.40	3.24	26.9	23.70	5.67	26.9	18.66	61.26	27.1	30.42	39.33	27.1	3.71	21.14
7.9	41.71	3.12	27.9	24.75	5.49	27.9	18.77	60.95	28.1	30.43	38.99	28.1	3.55	20.82
8.9	42.02	3.03	28.9	25.78	5.35	28.9	18.89	60.65	29.0	30.46	38.67	29.1	3.42	20.51
9.9	42.31	2.96	29.9	26.75	5.23	29.9	19.02	60.38	30.0	30.50	38.37	30.1	3.31	20.21
0.9	42.57	2.90	30.9	27.66	5.13	30.9	19.14	60.14	31.0	30.54	38.10	31.1	3.22	19.94
1.9	42.82	2.83	31.9	28.49	5.02	31.9	19.25	59.90	32.0	30.56	37.85	32.1	3.12	19.70
	13.66	+13.62		49.92	+49.91		12.29	+12.25		11.86	+11.81		20.40	+20.37
	$0^h\ 56^m$	$54^s.030$		$1^h\ 29^m$	$15^s.60$		$4^h\ 9^m$	$27^s.362$		$5^h\ 34^m$	$35^s.250$		$7^h\ 1^m$	$5^s.64$
	85° 48′	6″.45		+88° 51′	6″.49		+85° 19′	51″.71		+85° 9′	25″.87		+87° 11′	5″.45

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			***α* Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	De nat N
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
June	0 56	+85 48	June	1 28	+88 51	June	4 9	+85 19	June	5 34	+85 9	June	7 1	+87
	s	″		s	″		s	″		s	″		s	″
0.9	42.82	2.83	0.9	28.49	5.02	0.9	19.25	59.90	1.0	30.56	37.85	1.1	3.12	19.
1.8	43.05	2.75	1.9	29.26	4.89	1.9	19.34	59.67	2.0	30.57	37.60	2.1	3.00	19.
2.8	43.29	2.65	2.9	30.03	4.75	2.9	19.41	59.43	3.0	30.56	37.34	3.1	2.84	19.
3.8	43.53	2.53	3.9	30.82	4.60	3.9	19.49	59.16	4.0	30.55	37.06	4.1	2.67	18.
4.8	43.79	2.40	4.9	31.66	4.43	4.9	19.56	58.88	5.0	30.53	36.77	5.1	2.49	18.
5.8	44.07	2.27	5.9	32.58	4.25	5.9	19.65	58.57	6.0	30.52	36.45	6.1	2.30	18.
6.8	44.37	2.15	6.9	33.57	4.08	6.9	19.75	58.26	7.0	30.52	36.12	7.1	2.12	18.
7.8	44.68	2.04	7.9	34.62	3.92	7.9	19.88	57.95	8.0	30.54	35.77	8.1	1.96	17.
8.8	45.01	1.95	8.9	35.72	3.77	8.9	20.02	57.64	9.0	30.57	35.43	9.1	1.84	17.
9.8	45.33	1.88	9.8	36.85	3.65	9.9	20.17	57.33	10.0	30.61	35.08	10.1	1.74	17.
10.8	45.66	1.82	10.8	37.97	3.55	10.9	20.33	57.04	11.0	30.67	34.75	11.1	1.66	16.
11.8	45.98	1.79	11.8	39.08	3.46	11.9	20.50	56.78	12.0	30.75	34.43	12.1	1.61	16.
12.8	46.29	1.77	12.8	40.15	3.38	12.9	20.67	56.53	13.0	30.84	34.13	13.1	1.58	16.
13.8	46.59	1.76	13.8	41.17	3.32	13.9	20.84	56.30	14.0	30.92	33.85	14.1	1.56	15.
14.8	46.87	1.76	14.8	42.15	3.27	14.9	21.01	56.07	15.0	30.99	33.58	15.1	1.54	15.
15.8	47.13	1.75	15.8	43.08	3.21	15.9	21.17	55.86	15.9	31.07	33.33	16.1	1.51	15.
16.8	47.39	1.74	16.8	43.99	3.15	16.9	21.31	55.65	16.9	31.14	33.07	17.1	1.47	14.
17.8	47.66	1.71	17.8	44.89	3.07	17.9	21.44	55.43	17.9	31.20	32.81	18.1	1.42	14.
18.8	47.94	1.66	18.8	45.82	2.98	18.9	21.58	55.19	18.9	31.25	32.53	19.1	1.35	14.
19.8	48.23	1.61	19.8	46.82	2.88	19.9	21.72	54.94	19.9	31.30	32.22	20.0	1.27	14.
20.8	48.54	1.56	20.8	47.90	2.78	20.9	21.88	54.66	20.9	31.36	31.90	21.0	1.20	13.
21.8	48.87	1.52	21.8	49.07	2.69	21.9	22.06	54.37	21.9	31.44	31.56	22.0	1.14	13.
22.8	49.23	1.51	22.8	50.30	2.62	22.9	22.27	54.09	22.9	31.55	31.22	23.0	1.12	13.
23.8	49.59	1.53	23.8	51.57	2.58	23.9	22.49	53.83	23.9	31.68	30.88	24.0	1.15	12.
24.8	49.94	1.58	24.8	52.84	2.57	24.9	22.73	53.59	24.9	31.83	30.56	25.0	1.21	12.
25.8	50.28	1.65	25.8	54.06	2.58	25.9	22.98	53.37	25.9	31.98	30.27	26.0	1.30	12.
26.8	50.60	1.73	26.8	55.21	2.61	26.9	23.22	53.19	26.9	32.14	29.99	27.0	1.40	11.
27.8	50.89	1.82	27.8	56.27	2.64	27.9	23.44	53.03	27.9	32.29	29.75	28.0	1.51	11.
28.8	51.16	1.90	28.8	57.25	2.67	28.9	23.65	52.88	28.9	32.43	29.53	29.0	1.60	11.
29.8	51.43	1.96	29.8	58.22	2.68	29.9	23.84	52.71	29.9	32.56	29.29	30.0	1.68	10.
30.8	51.69	2.01	30.8	59.18	2.68	30.9	24.03	52.54	30.9	32.68	29.04	31.0	1.72	10.
31.8	51.97	2.04	31.8	60.17	2.67	31.9	24.21	52.34	31.9	32.78	28.78	32.0	1.74	10.
13.66		+13.62	49.86		+49.86	12.29		+12.25	11.85		+11.81	20.38		+20.3
0^h 56^m		$54^s.030$	1^h 29^m		$15^s.60$	4^h 9^m		$27^s.362$	5^h 34^m		$35^s.250$	7^h 1^m		$5^s.6$
+85° 48′		6″.45	+88° 51′		6″.49	+85° 19′		51″.71	+85° 9′		25″.87	+87° 11′		5″.4

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

3 H. Cephei. Mag. 4.5			α Ursæ Minoris. (*Polaris.*) Mag. 2.1			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4			51 H. Cephei. Mag. 5.3		
te.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
y	0 56	+85 48	July	1 28	+88 51	July	4 9	+85 19	July	5 34	+85 9	July	7 1	+87 11
	s	″		s	″		s	″		s	″		s	″
.8	51.69	2.01	0.8	59.18	2.68	0.9	24.03	52.54	0.9	32.68	29.04	1.0	1.72	10.54
.8	51.97	2.04	1.8	60.17	2.67	1.9	24.21	52.34	1.9	32.78	28.78	2.0	1.74	10.25
.8	52.27	2.05	2.8	61.22	2.64	2.9	24.40	52.12	2.9	32.89	28.50	3.0	1.77	9.93
.8	52.59	2.08	3.8	62.34	2.60	3.9	24.61	51.89	3.9	33.01	28.20	4.0	1.79	9.60
.8	52.92	2.12	4.8	63.52	2.58	4.9	24.83	51.66	4.9	33.14	27.89	5.0	1.83	9.25
.8	53.27	2.17	5.8	64.76	2.58	5.9	25.07	51.43	5.9	33.28	27.58	6.0	1.89	8.89
.7	53.61	2.24	6.8	66.02	2.59	6.9	25.32	51.21	6.9	33.44	27.27	7.0	1.99	8.53
.7	53.96	2.33	7.8	67.27	2.62	7.9	25.58	51.00	7.9	33.62	26.97	7.9	2.12	8.17
.7	54.30	2.45	8.8	68.50	2.68	8.9	25.85	50.82	8.9	33.81	26.69	8.9	2.26	7.82
.7	54.62	2.57	9.8	69.70	2.75	9.9	26.13	50.66	9.9	34.00	26.42	9.9	2.43	7.48
.7	54.93	2.71	10.8	70.85	2.83	10.9	26.40	50.51	10.9	34.19	26.18	10.9	2.61	7.16
.7	55.23	2.86	11.8	71.94	2.92	11.9	26.66	50.38	11.9	34.39	25.94	11.9	2.79	6.86
.7	55.51	3.00	12.8	72.98	3.03	12.9	26.90	50.27	12.9	34.59	25.73	12.9	2.98	6.57
.7	55.77	3.14	13.8	73.98	3.12	13.9	27.15	50.16	13.9	34.77	25.53	13.9	3.15	6.30
.7	56.03	3.26	14.8	74.95	3.20	14.9	27.38	50.04	14.9	34.94	25.32	14.9	3.31	6.02
.7	56.30	3.37	15.7	75.94	3.26	15.9	27.60	49.91	15.9	35.10	25.11	15.9	3.45	5.74
.7	56.58	3.48	16.7	76.96	3.31	16.9	27.84	49.76	16.9	35.27	24.87	16.9	3.58	5.44
.7	56.88	3.57	17.7	78.06	3.36	17.9	28.08	49.59	17.9	35.44	24.61	17.9	3.71	5.13
.7	57.20	3.68	18.7	79.23	3.41	18.9	28.34	49.42	18.9	35.61	24.34	18.9	3.85	4.79
.7	57.54	3.80	19.7	80.47	3.47	19.8	28.63	49.24	19.9	35.81	24.06	19.9	4.01	4.44
.7	57.88	3.95	20.7	81.77	3.57	20.8	28.92	49.07	20.9	36.03	23.77	20.9	4.21	4.07
1.7	58.22	4.14	21.7	83.07	3.69	21.8	29.24	48.93	21.9	36.28	23.50	21.9	4.46	3.72
2.7	58.55	4.35	22.7	84.33	3.84	22.8	29.57	48.81	22.9	36.53	23.26	22.9	4.74	3.37
3.7	58.86	4.57	23.7	85.52	4.02	23.8	29.89	48.72	23.9	36.79	23.05	23.9	5.04	3.05
4.7	59.14	4.80	24.7	86.62	4.20	24.8	30.19	48.67	24.9	37.04	22.86	24.9	5.35	2.76
5.7	59.40	5.03	25.7	87.63	4.38	25.8	30.49	48.63	25.9	37.29	22.69	25.9	5.65	2.49
6.7	59.65	5.24	26.7	88.58	4.55	26.8	30.76	48.57	26.9	37.52	22.53	26.9	5.92	2.24
7.7	59.89	5.43	27.7	89.51	4.70	27.8	31.02	48.51	27.9	37.74	22.37	27.9	6.17	1.99
8.7	60.14	5.61	28.7	90.46	4.83	28.8	31.27	48.44	28.9	37.94	22.19	28.9	6.40	1.73
9.7	60.40	5.78	29.7	91.46	4.95	29.8	31.53	48.35	29.9	38.15	21.99	29.9	6.61	1.45
0.7	60.68	5.94	30.7	92.51	5.06	30.8	31.79	48.25	30.9	38.36	21.78	30.9	6.82	1.16
1.7	60.98	6.11	31.7	93.63	5.18	31.8	32.08	48.13	31.9	38.57	21.55	31.9	7.05	0.84
13.66		+13.62		49.86	+49.86		12.28	+12.24		11.84	+11.80		20.36	+20.34
$0^h\ 56^m$		$54^s.030$		$1^h\ 29^m$	$15^s.60$		$4^h\ 9^m$	$27^s.362$		$5^h\ 34^m$	$35^s.250$		$7^h\ 1^m$	$5^s.64$
85° 48′		6″.45		+88° 51′	6″.49		+85° 19′	51″.71		+85° 9′	25″.87		+87° 11′	5″.45

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Aug.	0 57	+85 48	Aug.	1 29	+88 51	Aug.	4 9	+85 19	Aug.	5 34	+85 9	Aug.	7 1	+87
	s	″		s	″		s	″		s	″		s	″
0.7	0.98	6.11	0.7	33.63	5.18	0.8	32.08	48.13	0.9	38.57	21.55	0.9	7.05	60.
1.7	1.28	6.30	1.7	34.79	5.31	1.8	32.38	48.01	1.9	38.81	21.32	1.9	7.30	60.
2.7	1.60	6.50	2.7	35.99	5.46	2.8	32.69	47.91	2.9	39.06	21.09	2.9	7.57	60.
3.7	1.90	6.72	3.7	37.18	5.63	3.8	33.01	47.82	3.9	39.32	20.87	3.9	7.87	59.
4.7	2.20	6.97	4.7	38.36	5.82	4.8	33.34	47.75	4.9	39.59	20.67	4.9	8.19	59.
5.7	2.49	7.22	5.7	39.49	6.02	5.8	33.66	47.70	5.9	39.87	20.48	5.9	8.54	59.
6.7	2.77	7.49	6.7	40.57	6.24	6.8	33.98	47.67	6.9	40.16	20.31	6.9	8.90	58.
7.7	3.02	7.76	7.7	41.59	6.47	7.8	34.30	47.66	7.9	40.44	20.17	7.9	9.27	58.
8.7	3.26	8.04	8.7	42.56	6.71	8.8	34.61	47.66	8.9	40.71	20.04	8.9	9.64	58.
9.7	3.48	8.32	9.7	43.47	6.94	9.8	34.91	47.68	9.9	40.98	19.92	9.9	10.00	58.
10.7	3.69	8.58	10.7	44.34	7.16	10.8	35.20	47.68	10.8	41.24	19.81	10.9	10.34	58.
11.7	3.90	8.83	11.7	45.20	7.37	11.8	35.48	47.69	11.8	41.49	19.69	11.9	10.67	57.
12.6	4.13	9.06	12.7	46.08	7.56	12.8	35.75	47.67	12.8	41.73	19.56	12.9	10.97	57.
13.6	4.36	9.28	13.7	47.02	7.74	13.8	36.03	47.63	13.8	41.97	19.41	13.9	11.27	57.
14.6	4.61	9.51	14.7	48.03	7.92	14.8	36.32	47.58	14.8	42.22	19.24	14.9	11.58	57.
15.6	4.88	9.75	15.7	49.11	8.11	15.8	36.63	47.53	15.8	42.49	19.05	15.9	11.91	56.
16.6	5.17	10.01	16.7	50.24	8.33	16.8	36.96	47.48	16.8	42.78	18.87	16.9	12.26	56.
17.6	5.46	10.29	17.7	51.38	8.57	17.8	37.31	47.45	17.8	43.08	18.69	17.9	12.65	56.
18.6	5.73	10.61	18.7	52.49	8.84	18.8	37.67	47.45	18.8	43.40	18.55	18.9	13.07	55.
19.6	5.98	10.95	19.7	53.55	9.14	19.8	38.02	47.49	19.8	43.73	18.43	19.9	13.53	55.
20.6	6.21	11.29	20.7	54.51	9.44	20.8	38.37	47.55	20.8	44.06	18.33	20.9	14.01	55.
21.6	6.41	11.64	21.6	55.36	9.75	21.8	38.70	47.62	21.8	44.37	18.26	21.9	14.47	55.
22.6	6.59	11.97	22.6	56.15	10.05	22.8	39.01	47.70	22.8	44.67	18.21	22.9	14.91	54.
23.6	6.76	12.29	23.6	56.90	10.33	23.8	39.31	47.78	23.8	44.95	18.16	23.9	15.32	54.
24.6	6.94	12.58	24.6	57.66	10.59	24.8	39.60	47.84	24.8	45.21	18.09	24.9	15.71	54.
25.6	7.13	12.86	25.6	58.44	10.83	25.7	39.88	47.88	25.8	45.47	18.01	25.9	16.08	54.
26.6	7.33	13.13	26.6	59.25	11.07	26.7	40.16	47.91	26.8	45.74	17.91	26.9	16.44	54.
27.6	7.54	13.41	27.6	60.13	11.31	27.7	40.45	47.93	27.8	46.01	17.80	27.9	16.82	53.
28.6	7.76	13.69	28.6	61.06	11.55	28.7	40.77	47.94	28.8	46.29	17.68	28.9	17.20	53.
29.6	8.00	13.99	29.6	62.03	11.81	29.7	41.10	47.96	29.8	46.59	17.55	29.9	17.62	53.
30.6	8.23	14.31	30.6	62.99	12.09	30.7	41.43	47.99	30.8	46.90	17.43	30.9	18.05	53.
31.6	8.45	14.64	31.6	63.94	12.38	31.7	41.77	48.04	31.8	47.21	17.33	31.9	18.50	52.
13.66		+13.63	49.92		+49.91	12.28		+12.24	11.84		+11.80	20.34		+20.3
0^h 56^m		$54^s.030$	1^h 29^m		$15^s.60$	4^h 9^m		$27^s.362$	5^h 34^m		$35^s.250$	7^h 1^m		$5^s.6$
+85° 48′		6″.45	+88° 51′		6″.49	+85° 19′		51″.71	+85° 9′		25″.87	+87° 11′		5″.4

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

3 H. Cephei. Mag. 4.5			*α* Ursæ Minoris. (*Polaris.*) Mag. 2.1			Groombridge 750. Mag. 6.7			Groombridge 944. Mag. 6.4			51 H. Cephei. Mag. 5.3		
an lar te.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
pt.	0 57	+85 48	Sept.	1 30	+88 51	Sept.	4 9	+85 19	Sept.	5 34	+85 9	Sept.	7 1	+87 10
	s	″		s	″		s	″		s	″		s	″
.6	8.45	14.64	0.6	3.94	12.38	0.7	41.77	48.04	0.8	47.21	17.33	0.9	18.50	52.92
.6	8.66	14.99	1.6	4.85	12.69	1.7	42.11	48.12	1.8	47.54	17.26	1.8	18.98	52.70
.6	8.85	15.35	2.6	5.71	13.02	2.7	42.45	48.21	2.8	47.87	17.20	2.8	19.47	52.49
.6	9.03	15.72	3.6	6.52	13.36	3.7	42.78	48.32	3.8	48.21	17.17	3.8	19.97	52.31
.6	9.19	16.10	4.6	7.25	13.70	4.7	43.10	48.45	4.8	48.53	17.15	4.8	20.47	52.14
.6	9.33	16.46	5.6	7.90	14.04	5.7	43.41	48.59	5.8	48.84	17.14	5.8	20.96	52.00
.6	9.46	16.81	6.6	8.52	14.37	6.7	43.70	48.73	6.8	49.15	17.14	6.8	21.44	51.86
.6	9.59	17.15	7.6	9.12	14.69	7.7	43.98	48.87	7.8	49.44	17.14	7.8	21.90	51.73
.6	9.72	17.48	8.6	9.72	14.99	8.7	44.26	48.99	8.8	49.72	17.13	8.8	22.35	51.59
.6	9.86	17.80	9.6	10.35	15.28	9.7	44.53	49.09	9.8	50.00	17.11	9.8	22.78	51.43
.6	10.01	18.10	10.6	11.04	15.57	10.7	44.82	49.17	10.8	50.28	17.07	10.8	23.20	51.26
.6	10.18	18.42	11.6	11.81	15.86	11.7	45.12	49.25	11.8	50.57	17.01	11.8	23.63	51.07
.6	10.37	18.76	12.6	12.63	16.16	12.7	45.45	49.32	12.8	50.88	16.94	12.8	24.09	50.86
.6	10.56	19.12	13.6	13.48	16.48	13.7	45.79	49.41	13.8	51.21	16.88	13.8	24.58	50.65
.6	10.75	19.50	14.6	14.32	16.83	14.7	46.14	49.53	14.8	51.55	16.85	14.8	25.11	50.46
.6	10.91	19.90	15.6	15.09	17.20	15.7	46.48	49.67	15.8	51.91	16.84	15.8	25.66	50.29
.6	11.05	20.32	16.6	15.77	17.59	16.7	46.82	49.84	16.7	52.27	16.85	16.8	26.23	50.14
7.6	11.16	20.74	17.6	16.35	17.99	17.7	47.14	50.04	17.7	52.62	16.89	17.8	26.79	50.02
.5	11.25	21.15	18.6	16.84	18.38	18.7	47.44	50.25	18.7	52.95	16.96	18.8	27.34	49.94
.5	11.32	21.54	19.6	17.27	18.76	19.7	47.72	50.45	19.7	53.26	17.03	19.8	27.87	49.86
.5	11.39	21.91	20.6	17.67	19.11	20.7	47.98	50.64	20.7	53.55	17.09	20.8	28.37	49.78
.5	11.47	22.25	21.6	18.10	19.44	21.7	48.24	50.82	21.7	53.83	17.14	21.8	28.83	49.70
.5	11.56	22.58	22.6	18.57	19.76	22.7	48.50	50.97	22.7	54.11	17.17	22.8	29.29	49.60
3.5	11.66	22.90	23.6	19.08	20.08	23.7	48.76	51.11	23.7	54.40	17.19	23.8	29.75	49.48
4.5	11.78	23.24	24.6	19.65	20.39	24.7	49.04	51.25	24.7	54.69	17.19	24.8	30.21	49.36
5.5	11.90	23.59	25.6	20.25	20.72	25.7	49.33	51.39	25.7	54.99	17.19	25.8	30.69	49.23
6.5	12.03	23.96	26.6	20.87	21.06	26.7	49.64	51.54	26.7	55.31	17.20	26.8	31.20	49.09
7.5	12.14	24.34	27.5	21.47	21.42	27.7	49.95	51.70	27.7	55.63	17.21	27.8	31.73	48.96
.5	12.25	24.74	28.5	22.04	21.80	28.7	50.26	51.88	28.7	55.96	17.25	28.8	32.27	48.84
.5	12.35	25.14	29.5	22.55	22.19	29.7	50.56	52.09	29.7	56.29	17.31	29.8	32.83	48.74
.5	12.42	25.55	30.5	23.00	22.59	30.7	50.86	52.31	30.7	56.63	17.39	30.8	33.40	48.67
1.5	12.48	25.98	31.5	23.38	23.00	31.6	51.15	52.55	31.7	56.95	17.49	31.8	33.97	48.61
	13.67	+13.63		50.03	+50.02		12.28	+12.24		11.84	+11.80		20.33	+20.31
	0^h 56^m	$54^s.030$		1^h 29^m	$15^s.60$		4^h 9^m	$27^s.362$		5^h 34^m	$35^s.250$		7^h 1^m	$5^s.64$
	+85° 48′	6″.45		+88° 51′	6″.49		+85° 19′	51″.71		+85° 9′	25″.87		+87° 11′	5″.45

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Decli nati *Nort*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Oct.	0 57	+85 48	Oct.	1 30	+88 51	Oct.	4 9	+85 19	Oct.	5 34	+85 9	Oct.	7 1	+87
	s	″		s	″		s	″		s	″		s	″
0.5	12.42	25.55	0.5	23.00	22.59	0.7	50.86	52.31	0.7	56.63	17.39	0.8	33.40	48.6
1.5	12.48	25.98	1.5	23.38	23.00	1.6	51.15	52.55	1.7	56.95	17.49	1.8	33.97	48.6
2.5	12.51	26.38	2.5	23.69	23.40	2.6	51.43	52.80	2.7	57.27	17.61	2.8	34.54	48.5
3.5	12.53	26.78	3.5	23.95	23.79	3.6	51.69	53.05	3.7	57.57	17.73	3.8	35.08	48.5
4.5	12.54	27.17	4.5	24.17	24.17	4.6	51.93	53.30	4.7	57.87	17.85	4.8	35.61	48.5
5.5	12.56	27.55	5.5	24.38	24.54	5.6	52.17	53.55	5.7	58.16	17.97	5.8	36.12	48.5
6.5	12.58	27.90	6.5	24.60	24.90	6.6	52.41	53.77	6.7	58.43	18.08	6.8	36.60	48.4
7.5	12.61	28.25	7.5	24.87	25.24	7.6	52.64	53.97	7.7	58.71	18.17	7.7	37.07	48.4
8.5	12.67	28.60	8.5	25.21	25.57	8.6	52.89	54.16	8.7	58.99	18.25	8.7	37.55	48.3
9.5	12.73	28.95	9.5	25.61	25.92	9.6	53.15	54.36	9.7	59.28	18.31	9.7	38.05	48.3
10.5	12.81	29.32	10.5	26.04	26.28	10.6	53.43	54.55	10.7	59.59	18.37	10.7	38.57	48.2
11.5	12.88	29.71	11.5	26.47	26.66	11.6	53.72	54.76	11.7	59.92	18.45	11.7	39.13	48.1
12.5	12.94	30.13	12.5	26.86	27.07	12.6	54.02	55.00	12.7	60.26	18.55	12.7	39.71	48.0
13.5	12.96	30.57	13.5	27.17	27.50	13.6	54.30	55.27	13.7	60.60	18.68	13.7	40.31	48.0
14.5	12.97	31.01	14.5	27.38	27.94	14.6	54.58	55.56	14.7	60.92	18.83	14.7	40.92	48.0
15.5	12.95	31.44	15.5	27.49	28.37	15.6	54.83	55.87	15.7	61.24	19.00	15.7	41.51	48.0
16.5	12.90	31.84	16.5	27.51	28.79	16.6	55.06	56.18	16.7	61.53	19.20	16.7	42.08	48.1
17.5	12.85	32.22	17.5	27.49	29.19	17.6	55.27	56.48	17.7	61.80	19.39	17.7	42.61	48.1
18.5	12.80	32.58	18.5	27.47	29.57	18.6	55.46	56.77	18.7	62.06	19.57	18.7	43.10	48.2
19.5	12.77	32.93	19.5	27.47	29.92	19.6	55.66	57.04	19.7	62.31	19.73	19.7	43.58	48.2
20.5	12.74	33.27	20.5	27.54	30.26	20.6	55.86	57.28	20.7	62.57	19.88	20.7	44.05	48.3
21.5	12.73	33.60	21.5	27.65	30.59	21.6	56.06	57.52	21.7	62.82	20.01	21.7	44.53	48.3
22.5	12.73	33.94	22.5	27.81	30.94	22.6	56.28	57.75	22.6	63.08	20.13	22.7	45.01	48.3
23.5	12.74	34.30	23.5	27.98	31.30	23.6	56.51	57.99	23.6	63.36	20.25	23.7	45.51	48.3
24.4	12.73	34.66	24.5	28.15	31.67	24.6	56.74	58.24	24.6	63.66	20.38	24.7	46.04	48.2
25.4	12.73	35.05	25.5	28.29	32.07	25.6	56.98	58.51	25.6	63.94	20.53	25.7	46.58	48.3
26.4	12.71	35.46	26.5	28.37	32.47	26.6	57.21	58.80	26.6	64.24	20.70	26.7	47.14	48.3
27.4	12.66	35.86	27.5	28.39	32.87	27.6	57.43	59.10	27.6	64.53	20.90	27.7	47.70	48.3
28.4	12.61	36.26	28.5	28.34	33.29	28.6	57.65	59.43	28.6	64.82	21.11	28.7	48.25	48.4
29.4	12.53	36.64	29.5	28.22	33.70	29.6	57.85	59.77	29.6	65.09	21.34	29.7	48.80	48.5
30.4	12.43	37.03	30.5	28.03	34.10	30.6	58.03	60.11	30.6	65.35	21.58	30.7	49.34	48.6
31.4	12.32	37.40	31.5	27.80	34.48	31.6	58.20	60.44	31.6	65.60	21.82	31.7	49.86	48.7
	13.68	+13.65		50.17	+50.16		12.29	+12.25		11.84	+11.80		20.33	+20.30
	0^h 56^m	$54^s.030$		1^h 29^m	$15^s.60$		4^h 9^m	$27^s.362$		5^h 34^m	$35^s.250$		7^h 1^m	$5^s.64$
	+85° 48′	6″.45		+88° 51′	6″.49		+85° 19′	51″.71		+85° 9′	25″.87		+87° 11′	5″.45

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			*α* **Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
ean olar ate.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
ov.	0 57	+85 48	Nov.	1 30	+88 51	Nov.	4 9	+85 20	Nov.	5 35	+85 9	Nov.	7 1	+87 10
	s	″		s	″		s	″		s	″		s	″
0.4	12.32	37.40	0.5	27.80	34.48	0.6	58.20	0.44	0.6	5.60	21.82	0.7	49.86	48.76
1.4	12.21	37.75	1.5	27.54	34.86	1.6	58.35	0.77	1.6	5.84	22.06	1.7	50.35	48.88
2.4	12.10	38.08	2.4	27.30	35.21	2.6	58.49	1.08	2.6	6.06	22.28	2.7	50.82	48.99
3.4	12.00	38.40	3.4	27.09	35.55	3.6	58.64	1.38	3.6	6.28	22.49	3.7	51.28	49.09
4.4	11.92	38.72	4.4	26.93	35.88	4.6	58.79	1.65	4.6	6.50	22.69	4.7	51.72	49.17
5.4	11.86	39.04	5.4	26.83	36.21	5.6	58.96	1.92	5.6	6.73	22.87	5.7	52.18	49.24
6.4	11.80	39.37	6.4	26.78	36.55	6.5	59.14	2.19	6.6	6.97	23.04	6.7	52.66	49.29
7.4	11.75	39.72	7.4	26.75	36.92	7.5	59.33	2.48	7.6	7.23	23.22	7.7	53.16	49.35
8.4	11.69	40.10	8.4	26.69	37.31	8.5	59.53	2.78	8.6	7.50	23.42	8.7	53.70	49.42
9.4	11.61	40.48	9.4	26.56	37.71	9.5	59.72	3.11	9.6	7.77	23.65	9.7	54.24	49.51
0.4	11.51	40.88	10.4	26.35	38.13	10.5	59.91	3.47	10.6	8.05	23.91	10.7	54.80	49.63
1.4	11.37	41.27	11.4	26.03	38.54	11.5	60.07	3.84	11.6	8.30	24.19	11.7	55.35	49.78
2.4	11.21	41.65	12.4	25.61	38.94	12.5	60.21	4.22	12.6	8.54	24.49	12.7	55.88	49.95
3.4	11.04	41.99	13.4	25.13	39.31	13.5	60.33	4.59	13.6	8.75	24.79	13.6	56.36	50.13
4.4	10.86	42.31	14.4	24.62	39.65	14.5	60.42	4.94	14.6	8.94	25.08	14.6	56.80	50.32
5.4	10.70	42.60	15.4	24.14	39.98	15.5	60.51	5.27	15.6	9.12	25.35	15.6	57.22	50.50
6.4	10.54	42.87	16.4	23.70	40.29	16.5	60.60	5.58	16.6	9.29	25.60	16.6	57.62	50.66
7.4	10.41	43.15	17.4	23.33	40.58	17.5	60.70	5.88	17.6	9.46	25.83	17.6	58.02	50.81
8.4	10.29	43.42	18.4	22.99	40.88	18.5	60.81	6.16	18.6	9.64	26.05	18.6	58.42	50.94
9.4	10.17	43.70	19.4	22.69	41.19	19.5	60.92	6.46	19.6	9.83	26.27	19.6	58.84	51.07
0.4	10.06	44.00	20.4	22.38	41.51	20.5	61.04	6.76	20.6	10.03	26.50	20.6	59.27	51.19
1.4	9.93	44.31	21.4	22.06	41.85	21.5	61.17	7.07	21.6	10.24	26.74	21.6	59.72	51.34
2.4	9.80	44.63	22.4	21.69	42.20	22.5	61.28	7.39	22.6	10.45	27.00	22.6	60.18	51.49
3.4	9.65	44.96	23.4	21.26	42.55	23.5	61.39	7.74	23.6	10.65	27.28	23.6	60.64	51.66
4.4	9.48	45.27	24.4	20.76	42.90	24.5	61.50	8.10	24.6	10.85	27.58	24.6	61.11	51.86
5.4	9.28	45.59	25.4	20.19	43.25	25.5	61.59	8.48	25.6	11.03	27.89	25.6	61.56	52.07
6.4	9.07	45.90	26.4	19.56	43.60	26.5	61.66	8.85	26.6	11.21	28.21	26.6	62.00	52.31
7.4	8.84	46.18	27.4	18.87	43.93	27.5	61.71	9.22	27.6	11.36	28.54	27.6	62.42	52.55
8.4	8.62	46.46	28.4	18.15	44.24	28.5	61.74	9.59	28.5	11.50	28.87	28.6	62.81	52.79
9.4	8.39	46.71	29.4	17.43	44.53	29.5	61.77	9.94	29.5	11.64	29.18	29.6	63.17	53.03
30.3	8.17	46.93	30.4	16.73	44.80	30.5	61.80	10.27	30.5	11.76	29.48	30.6	63.51	53.27
31.3	7.97	47.15	31.4	16.08	45.05	31.5	61.82	10.59	31.5	11.87	29.77	31.6	63.83	53.49
13.69		+13.66	50.31		+50.30	12.29		+12.25	11.84		+11.80	20.33		+20.31
0^h 56^m		$54^s.030$	1^h 29^m		$15^s.60$	4^h 9^m		$27^s.362$	5^h 34^m		$35^s.250$	7^h 1^m		$5^s.64$
+85° 48′		6″.45	+88° 51′		6″.49	+85° 19′		51″.71	+85° 9′		25″.87	+87° 11′		5″.45

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

43 H. Cephei. Mag. 4.5			**α Ursæ Minoris.** (*Polaris.*) Mag. 2.1			**Groombridge 750.** Mag. 6.7			**Groombridge 944.** Mag. 6.4			**51 H. Cephei.** Mag. 5.3		
Mean Solar Date.	**Right Ascension.**	**Declination** *North.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *North.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *North.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *North.*	**Mean Solar Date.**	**Right Ascension.**	**D**
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	
Dec.	0 57	+85 48	Dec.	1 29	+88 51	Dec.	4 10	+85 20	Dec.	5 35	+85 9	Dec.	7 2	+87
	s	″		s	″		s	″		s	″		s	
0.3	8.17	46.93	0.4	76.73	44.80	0.5	1.80	10.27	0.5	11.76	29.48	0.6	3.51	53
1.3	7.97	47.15	1.4	76.08	45.05	1.5	1.82	10.59	1.5	11.87	29.77	1.6	3.83	53
2.3	7.79	47.36	2.4	75.50	45.30	2.5	1.86	10.88	2.5	11.99	30.03	2.6	4.16	53
3.3	7.63	47.58	3.4	74.99	45.56	3.5	1.91	11.17	3.5	12.12	30.28	3.6	4.51	53
4.3	7.47	47.82	4.4	74.50	45.84	4.5	1.97	11.47	4.5	12.28	30.54	4.6	4.87	54
5.3	7.30	48.08	5.4	73.99	46.13	5.5	2.04	11.78	5.5	12.44	30.81	5.6	5.26	54
6.3	7.13	48.36	6.4	73.44	46.44	6.5	2.12	12.12	6.5	12.61	31.09	6.6	5.67	54
7.3	6.93	48.65	7.4	72.82	46.76	7.5	2.18	12.48	7.5	12.77	31.41	7.6	6.09	54
8.3	6.70	48.93	8.4	72.09	47.09	8.5	2.21	12.87	8.5	12.92	31.75	8.6	6.50	54
9.3	6.45	49.19	9.3	71.27	47.40	9.5	2.23	13.26	9.5	13.05	32.11	9.6	6.89	55
10.3	6.18	49.43	10.3	70.38	47.69	10.5	2.23	13.64	10.5	13.16	32.47	10.6	7.24	55
11.3	5.90	49.64	11.3	69.44	47.95	11.5	2.20	14.00	11.5	13.25	32.82	11.6	7.55	55
12.3	5.63	49.83	12.3	68.52	48.18	12.5	2.17	14.34	12.5	13.32	33.16	12.6	7.83	56
13.3	5.37	49.99	13.3	67.64	48.39	13.4	2.12	14.66	13.5	13.37	33.47	13.6	8.07	56
14.3	5.13	50.14	14.3	66.82	48.59	14.4	2.08	14.96	14.5	13.43	33.77	14.6	8.30	56
15.3	4.91	50.29	15.3	66.05	48.78	15.4	2.05	15.25	15.5	13.49	34.06	15.6	8.54	56
16.3	4.69	50.43	16.3	65.32	48.97	16.4	2.03	15.53	16.5	13.55	34.34	16.6	8.78	57
17.3	4.48	50.59	17.3	64.60	49.17	17.4	2.01	15.81	17.5	13.62	34.61	17.6	9.03	57
18.3	4.27	50.77	18.3	63.88	49.38	18.4	2.00	16.10	18.5	13.70	34.90	18.6	9.30	57
19.3	4.04	50.95	19.3	63.13	49.60	19.4	1.98	16.41	19.5	13.78	35.20	19.6	9.57	57
20.3	3.81	51.13	20.3	62.33	49.83	20.4	1.96	16.73	20.5	13.86	35.51	20.5	9.86	58.
21.3	3.56	51.32	21.3	61.47	50.06	21.4	1.93	17.07	21.5	13.93	35.84	21.5	10.14	58.
22.3	3.29	51.50	22.3	60.54	50.29	22.4	1.89	17.41	22.5	13.99	36.18	22.5	10.42	58.
23.3	3.00	51.67	23.3	59.55	50.51	23.4	1.83	17.76	23.5	14.04	36.54	23.5	10.67	58.
24.3	2.70	51.81	24.3	58.52	50.72	24.4	1.76	18.11	24.5	14.08	36.90	24.5	10.90	59.3
25.3	2.40	51.94	25.3	57.45	50.91	25.4	1.67	18.44	25.5	14.09	37.26	25.5	11.11	59.
26.3	2.10	52.04	26.3	56.37	51.07	26.4	1.56	18.75	26.5	14.10	37.61	26.5	11.29	59.
27.3	1.80	52.13	27.3	55.31	51.21	27.4	1.45	19.05	27.5	14.09	37.94	27.5	11.43	60.3
28.3	1.52	52.20	28.3	54.30	51.33	28.4	1.34	19.33	28.5	14.06	38.25	28.5	11.56	60.6
29.3	1.26	52.26	29.3	53.34	51.44	29.4	1.23	19.59	29.5	14.05	38.54	29.5	11.68	60.9
30.3	1.02	52.32	30.3	52.46	51.55	30.4	1.14	19.84	30.5	14.04	38.81	30.5	11.80	61.1
31.3	0.78	52.40	31.3	51.63	51.67	31.4	1.06	20.08	31.5	14.05	39.07	31.5	11.94	61.4
13.70		+13.66	50.42		+50.41	12.30		+12.26	11.85		+11.81	20.34		+20.32
0^h 56^m		$54^s.030$	1^h 29^m		$15^s.60$	4^h 9^m		$27^s.362$	5^h 34^m		$35^s.250$	7^h 1^m		$5^s.64$
+85° 48′		6″.45	+88° 51′		6″.49	+85° 19′		51″.71	+85° 9′		25″.87	+87° 11′		5″.45

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

roombridge 1119. Mag. 7.0			1 H. Draconis. Mag. 4.6			30 H. Camelop. Mag. 5.3			Bradley 1672. Mag. 6.3			Groombridge 2283. Mag. 7.2		
ean olar ate.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
an.	8 15	+88 53	Jan.	9 25	+81 42	Jan.	10 21	+82 59	Jan.	12 14	+88 9	Jan.	15 4	+87 33
	s	″		s	″		s	″		s	″		s	″
0.6	16.44	17.96	0.6	15.29	0.76	0.7	0.83	13.18	0.7	46.87	51.52	0.8	5.27	14.17
1.6	17.26	18.23	1.6	15.44	0.92	1.7	1.03	13.27	1.7	47.61	51.45	1.8	5.62	13.87
2.6	18.05	18.53	2.6	15.60	1.10	2.7	1.23	13.38	2.7	48.39	51.40	2.8	6.02	13.58
3.6	18.80	18.84	3.6	15.75	1.31	3.6	1.43	13.52	3.7	49.20	51.37	3.8	6.44	13.31
4.6	19.48	19.15	4.6	15.89	1.54	4.6	1.62	13.68	4.7	50.00	51.37	4.8	6.89	13.06
5.6	20.06	19.48	5.6	16.01	1.77	5.6	1.80	13.85	5.7	50.76	51.39	5.8	7.34	12.83
6.6	20.53	19.79	6.6	16.12	2.01	6.6	1.97	14.03	6.7	51.48	51.42	6.8	7.79	12.62
7.5	20.95	20.09	7.6	16.23	2.24	7.6	2.12	14.21	7.7	52.15	51.47	7.8	8.21	12.44
8.5	21.33	20.37	8.6	16.33	2.45	8.6	2.25	14.38	8.7	52.77	51.51	8.8	8.60	12.27
9.5	21.72	20.62	9.6	16.43	2.64	9.6	2.39	14.52	9.7	53.35	51.53	9.8	8.96	12.10
10.5	22.14	20.87	10.6	16.52	2.81	10.6	2.53	14.64	10.7	53.92	51.55	10.8	9.30	11.93
11.5	22.63	21.10	11.6	16.62	2.98	11.6	2.67	14.75	11.7	54.51	51.55	11.8	9.64	11.73
12.5	23.17	21.34	12.6	16.74	3.15	12.6	2.83	14.87	12.7	55.15	51.54	12.8	9.99	11.52
13.5	23.75	21.62	13.6	16.86	3.34	13.6	3.00	15.00	13.7	55.82	51.53	13.8	10.37	11.29
14.5	24.33	21.91	14.6	16.98	3.55	14.6	3.17	15.16	14.7	56.56	51.53	14.8	10.79	11.06
15.5	24.88	22.23	15.6	17.11	3.79	15.6	3.35	15.33	15.7	57.32	51.55	15.8	11.25	10.83
16.5	25.38	22.57	16.6	17.23	4.05	16.6	3.52	15.53	16.7	58.09	51.60	16.8	11.74	10.62
17.5	25.78	22.91	17.6	17.34	4.33	17.6	3.68	15.76	17.7	58.85	51.68	17.8	12.26	10.44
18.5	26.06	23.27	18.6	17.43	4.62	18.6	3.83	16.00	18.7	59.57	51.79	18.8	12.78	10.29
19.5	26.27	23.61	19.6	17.51	4.91	19.6	3.96	16.24	19.7	60.26	51.91	19.8	13.30	10.16
20.5	26.42	23.94	20.6	17.59	5.19	20.6	4.08	16.49	20.7	60.90	52.04	20.8	13.79	10.05
21.5	26.53	24.25	21.6	17.66	5.46	21.6	4.19	16.72	21.7	61.49	52.17	21.8	14.26	9.96
22.5	26.61	24.54	22.6	17.72	5.72	22.6	4.30	16.94	22.7	62.06	52.30	22.8	14.71	9.87
23.5	26.72	24.82	23.6	17.78	5.96	23.6	4.41	17.16	23.7	62.61	52.41	23.8	15.15	9.77
24.5	26.83	25.10	24.6	17.85	6.20	24.6	4.51	17.37	24.7	63.16	52.52	24.8	15.58	9.68
25.5	26.99	25.38	25.5	17.91	6.43	25.6	4.62	17.57	25.7	63.72	52.62	25.8	16.00	9.57
26.5	27.19	25.67	26.5	17.99	6.67	26.6	4.73	17.77	26.7	64.30	52.71	26.8	16.43	9.45
27.5	27.39	25.96	27.5	18.06	6.91	27.6	4.85	17.97	27.7	64.91	52.81	27.8	16.88	9.33
28.5	27.61	26.27	28.5	18.14	7.17	28.6	4.98	18.19	28.7	65.55	52.91	28.8	17.36	9.20
29.5	27.82	26.60	29.5	18.22	7.44	29.6	5.11	18.43	29.7	66.22	53.02	29.8	17.86	9.07
30.5	27.99	26.95	30.5	18.30	7.74	30.6	5.24	18.69	30.7	66.90	53.15	30.8	18.39	8.95
31.5	28.09	27.30	31.5	18.37	8.06	31.6	5.37	18.96	31.6	67.58	53.31	31.8	18.94	8.85
	51.60	+51.59		6.93	+6.86		8.19	+8.13		31.22	+31.20		23.42	+23.40
	$8^h\ 13^m$	$47^s.916$		$9^h\ 25^m$	$4^s.133$		$10^h\ 20^m$	$49^s.679$		$12^h\ 14^m$	$27^s.688$		$15^h\ 4^m$	$20^s.10$
	+88° 53′	22″.50		+81° 42′	12″.85		+82° 59′	30″.46		+88° 10′	15″.98		+87° 33′	38″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge** Mag. 7.2		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	De
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Feb.	8 15	+88 53	Feb.	9 25	+81 42	Feb.	10 21	+82 59	Feb.	12 15	+88 9	Feb.	15 4	+87
	s	″		s	″		s	″		s	″		s	″
0.5	28.09	27.30	0.5	18.37	8.06	0.6	5.37	18.96	0.6	7.58	53.31	0.8	18.94	8.8
1.5	28.11	27.66	1.5	18.43	8.38	1.6	5.48	19.26	1.6	8.24	53.49	1.8	19.50	8.7
2.5	28.02	28.01	2.5	18.48	8.71	2.6	5.58	19.56	2.6	8.86	53.69	2.8	20.06	8.7
3.5	27.86	28.35	3.5	18.51	9.04	3.6	5.66	19.86	3.6	9.42	53.90	3.8	20.60	8.7
4.5	27.64	28.67	4.5	18.53	9.34	4.6	5.73	20.16	4.6	9.92	54.11	4.8	21.11	8.7
5.5	27.40	28.96	5.5	18.55	9.62	5.6	5.78	20.43	5.6	10.37	54.31	5.8	21.58	8.7
6.5	27.18	29.23	6.5	18.57	9.87	6.6	5.84	20.67	6.6	10.80	54.50	6.8	22.01	8.7
7.5	27.02	29.49	7.5	18.59	10.12	7.6	5.90	20.90	7.6	11.23	54.67	7.7	22.43	8.7
8.5	26.93	29.75	8.5	18.62	10.36	8.5	5.97	21.13	8.6	11.68	54.82	8.7	22.85	8.6
9.5	26.88	30.02	9.5	18.66	10.62	9.5	6.05	21.36	9.6	12.17	54.97	9.7	23.29	8.6
10.5	26.85	30.31	10.5	18.70	10.89	10.5	6.14	21.60	10.6	12.71	55.12	10.7	23.76	8.5
11.5	26.80	30.63	11.5	18.75	11.18	11.5	6.23	21.87	11.6	13.28	55.29	11.7	24.27	8.5
12.4	26.69	30.97	12.5	18.79	11.50	12.5	6.32	22.17	12.6	13.87	55.50	12.7	24.82	8.4
13.4	26.50	31.31	13.5	18.82	11.83	13.5	6.40	22.48	13.6	14.44	55.73	13.7	25.38	8.4
14.4	26.21	31.66	14.5	18.84	12.18	14.5	6.46	22.81	14.6	14.97	55.97	14.7	25.95	8.4
15.4	25.84	32.00	15.5	18.85	12.52	15.5	6.51	23.15	15.6	15.47	56.24	15.7	26.51	8.5
16.4	25.38	32.32	16.5	18.84	12.85	16.5	6.55	23.47	16.6	15.91	56.51	16.7	27.05	8.5
17.4	24.89	32.62	17.5	18.83	13.17	17.5	6.58	23.80	17.6	16.30	56.79	17.7	27.56	8.6
18.4	24.37	32.91	18.5	18.81	13.47	18.5	6.59	24.11	18.6	16.66	57.07	18.7	28.04	8.7
19.4	23.86	33.18	19.5	18.79	13.76	19.5	6.61	24.41	19.6	16.98	57.33	19.7	28.50	8.8
20.4	23.35	33.43	20.5	18.76	14.03	20.5	6.62	24.69	20.6	17.30	57.58	20.7	28.94	8.9
21.4	22.88	33.67	21.5	18.75	14.30	21.5	6.64	24.97	21.6	17.62	57.82	21.7	29.38	8.9
22.4	22.45	33.92	22.5	18.73	14.57	22.5	6.65	25.23	22.6	17.95	58.05	22.7	29.81	9.0
23.4	22.04	34.17	23.5	18.73	14.84	23.5	6.67	25.50	23.6	18.29	58.28	23.7	30.25	9.1
24.4	21.67	34.44	24.5	18.72	15.11	24.5	6.71	25.78	24.6	18.67	58.51	24.7	30.71	9.1
25.4	21.29	34.72	25.5	18.72	15.40	25.5	6.75	26.07	25.6	19.07	58.75	25.7	31.19	9.2
26.4	20.89	35.01	26.5	18.71	15.70	26.5	6.78	26.37	26.6	19.49	59.00	26.7	31.69	9.2
27.4	20.44	35.31	27.5	18.70	16.02	27.5	6.81	26.69	27.6	19.90	59.27	27.7	32.21	9.3
28.4	19.90	35.62	28.5	18.68	16.35	28.5	6.83	27.03	28.6	20.30	59.56	28.7	32.75	9.4
29.4	19.28	35.92	29.5	18.65	16.68	29.5	6.84	27.38	29.6	20.66	59.87	29.7	33.27	9.5
30.4	18.58	36.21	30.4	18.60	17.01	30.5	6.83	27.72	30.6	20.96	60.19	30.7	33.78	9.6
31.4	17.81	36.47	31.4	18.54	17.32	31.5	6.81	28.06	31.6	21.19	60.52	31.7	34.25	9.8
	51.72	+51.72		6.93	+6.86		8.19	+8.13		31.24	+31.22		23.42	+23.3
	$8^h\ 13^m$	$47^s.916$		$9^h\ 25^m$	$4^s.133$		$10^h\ 20^m$	$49^s.679$		$12^h\ 14^m$	$27^s.688$		$15^h\ 4^m$	$20^s.1$
	+88° 53′	22″.50		+81° 42′	12″.85		+82° 59′	30″.46		+88° 10′	15″.98		+87° 33′	38″.3

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

roombridge 1119. Mag. 7.0			**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge 2283.** Mag. 7.2		
ean olar ate.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
ar.	8 14	+88 53	Mar.	9 25	+81 42	Mar.	10 21	+82 59	Mar.	12 15	+88 9	Mar.	15 4	+87 33
	s	″		s	″		s	″		s	″		s	″
0.4	79.90	35.62	0.5	18.68	16.35	0.5	6.83	27.03	0.6	20.30	59.56	0.7	32.75	9.42
1.4	79.28	35.92	1.5	18.65	16.68	1.5	6.84	27.38	1.6	20.66	59.87	1.7	33.27	9.53
2.4	78.58	36.21	2.4	18.60	17.01	2.5	6.83	27.72	2.6	20.96	60.19	2.7	33.78	9.68
3.4	77.81	36.47	3.4	18.54	17.32	3.5	6.81	28.06	3.6	21.19	60.52	3.7	34.25	9.84
4.4	77.00	36.71	4.4	18.48	17.60	4.5	6.77	28.37	4.6	21.37	60.84	4.7	34.67	10.02
5.4	76.22	36.92	5.4	18.42	17.86	5.5	6.74	28.66	5.6	21.52	61.14	5.7	35.06	10.20
6.4	75.48	37.11	6.4	18.36	18.10	6.5	6.69	28.93	6.6	21.64	61.41	6.7	35.43	10.36
7.4	74.80	37.29	7.4	18.30	18.32	7.5	6.66	29.18	7.6	21.77	61.67	7.7	35.78	10.51
8.4	74.19	37.48	8.4	18.26	18.55	8.5	6.64	29.43	8.6	21.95	61.92	8.7	36.15	10.63
9.4	73.62	37.69	9.4	18.22	18.79	9.5	6.63	29.69	9.5	22.16	62.17	9.7	36.54	10.75
0.4	73.06	37.91	10.4	18.18	19.05	10.5	6.62	29.96	10.5	22.41	62.43	10.7	36.95	10.87
1.4	72.44	38.16	11.4	18.14	19.33	11.5	6.61	30.26	11.5	22.67	62.70	11.7	37.39	10.99
2.4	71.76	38.41	12.4	18.10	19.63	12.5	6.60	30.58	12.5	22.93	63.00	12.7	37.86	11.14
3.4	71.00	38.67	13.4	18.04	19.93	13.5	6.57	30.91	13.5	23.16	63.32	13.7	38.34	11.31
4.4	70.15	38.92	14.4	17.97	20.24	14.5	6.53	31.24	14.5	23.35	63.66	14.7	38.80	11.50
5.4	69.23	39.15	15.4	17.89	20.54	15.5	6.47	31.58	15.5	23.49	64.01	15.6	39.24	11.72
6.4	68.26	39.35	16.4	17.80	20.81	16.5	6.41	31.90	16.5	23.57	64.36	16.6	39.65	11.95
7.4	67.26	39.54	17.4	17.70	21.07	17.4	6.33	32.21	17.5	23.59	64.71	17.6	40.03	12.20
8.4	66.28	39.71	18.4	17.60	21.31	18.4	6.25	32.50	18.5	23.60	65.04	18.6	40.38	12.45
9.4	65.31	39.86	19.4	17.51	21.53	19.4	6.17	32.77	19.5	23.58	65.36	19.6	40.71	12.69
0.4	64.37	39.99	20.4	17.42	21.74	20.4	6.09	33.02	20.5	23.56	65.66	20.6	41.02	12.92
1.3	63.48	40.13	21.4	17.33	21.95	21.4	6.01	33.27	21.5	23.54	65.95	21.6	41.32	13.14
2.3	62.63	40.26	22.4	17.25	22.15	22.4	5.94	33.52	22.5	23.54	66.23	22.6	41.62	13.35
3.3	61.81	40.40	23.4	17.17	22.35	23.4	5.88	33.76	23.5	23.55	66.51	23.6	41.93	13.55
24.3	60.99	40.56	24.4	17.09	22.57	24.4	5.82	34.02	24.5	23.60	66.79	24.6	42.25	13.74
25.3	60.20	40.73	25.4	17.02	22.80	25.4	5.76	34.28	25.5	23.67	67.07	25.6	42.59	13.94
26.3	59.36	40.90	26.4	16.94	23.04	26.4	5.71	34.55	26.5	23.73	67.37	26.6	42.95	14.14
27.3	58.46	41.09	27.4	16.85	23.30	27.4	5.65	34.84	27.5	23.78	67.69	27.6	43.32	14.37
28.3	57.51	41.27	28.4	16.76	23.55	28.4	5.57	35.14	28.5	23.81	68.02	28.6	43.68	14.61
29.3	56.45	41.43	29.4	16.65	23.79	29.4	5.48	35.43	29.5	23.78	68.37	29.6	44.02	14.88
30.3	55.35	41.56	30.4	16.54	24.01	30.4	5.38	35.71	30.5	23.69	68.72	30.6	44.34	15.17
31.3	54.21	41.67	31.4	16.42	24.22	31.4	5.25	35.98	31.5	23.53	69.06	31.6	44.61	15.48
	51.82	+51.81		6.93	+6.86		8.20	+8.13		31.28	+31.26		23.42	+23.40
	$8^h\ 13^m$	$47^s.916$		$9^h\ 25^m$	$4^s.133$		$10^h\ 20^m$	$49^s.679$		$12^h\ 14^m$	$27^s.688$		$15^h\ 4^m$	$20^s.10$
	+88° 53′	22″.50		+81° 42′	12″.85		+82° 59′	30″.46		+88° 10′	15″.98		+87° 33′	38″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge** Mag. 7.2		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Dec nati *Nor*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Apr.	8 14	+88 53	Apr.	9 25	+81 42	Apr.	10 21	+82 59	Apr.	12 15	+88 10	Apr.	15 4	+87
	s	″		s	″		s	″		s	″		s	″
0.3	54.21	41.67	0.4	16.42	24.22	0.4	5.25	35.98	0.5	23.53	9.06	0.6	44.61	15.
1.3	53.08	41.75	1.4	16.29	24.39	1.4	5.13	36.22	1.5	23.34	9.39	1.6	44.84	15.
2.3	51.98	41.80	2.4	16.16	24.54	2.4	5.00	36.43	2.5	23.11	9.69	2.6	45.02	16.
3.3	50.97	41.83	3.4	16.05	24.67	3.4	4.88	36.62	3.5	22.88	9.97	3.6	45.19	16.
4.3	50.02	41.88	4.4	15.94	24.80	4.4	4.77	36.80	4.5	22.68	10.22	4.6	45.36	16.
5.3	49.15	41.93	5.4	15.84	24.93	5.4	4.68	36.98	5.5	22.53	10.47	5.6	45.54	16.
6.3	48.29	42.00	6.4	15.75	25.07	6.4	4.59	37.18	6.5	22.41	10.72	6.6	45.74	17.
7.3	47.41	42.10	7.4	15.66	.25.24	7.4	4.50	37.39	7.5	22.32	10.99	7.6	45.98	17.
8.3	46.50	42.20	8.3	15.56	25.42	8.4	4.42	37.63	8.5	22.24	11.28	8.6	46.24	17.
9.3	45.51	42.31	9.3	15.45	25.61	9.4	4.32	37.87	9.5	22.13	11.59	9.6	46.51	17.
10.3	44.45	42.41	10.3	15.33	25.81	10.4	4.21	38.12	10.5	21.99	11.91	10.6	46.77	18.
11.3	43.30	42.50	11.3	15.21	25.99	11.4	4.09	38.37	11.5	21.80	12.24	11.6	47.01	18.
12.3	42.13	42.56	12.3	15.07	26.16	12.4	3.95	38.60	12.5	21.55	12.57	12.6	47.21	18.
13.3	40.93	42.60	13.3	14.94	26.31	13.4	3.80	38.82	13.5	21.25	12.89	13.6	47.38	19.
14.3	39.72	42.62	14.3	14.79	26.43	14.4	3.65	39.02	14.5	20.92	13.20	14.6	47.53	19.
15.3	38.56	42.61	15.3	14.65	26.54	15.4	3.50	39.20	15.4	20.56	13.49	15.6	47.64	19.
16.3	37.43	42.60	16.3	14.51	26.63	16.4	3.35	39.36	16.4	20.20	13.77	16.6	47.73	20.
17.3	36.35	42.57	17.3	14.38	26.71	17.4	3.21	39.51	17.4	19.84	14.03	17.6	47.80	20.
18.3	35.34	42.55	18.3	14.25	26.79	18.4	3.08	39.65	18.4	19.49	14.28	18.6	47.87	20.
19.3	34.36	42.53	19.3	14.12	26.86	19.4	2.94	39.79	19.4	19.17	14.51	19.6	47.94	20.
20.3	33.41	42.52	20.3	14.01	26.94	20.4	2.82	39.93	20.4	18.87	14.75	20.6	48.03	21.
21.3	32.48	42.51	21.3	13.90	27.03	21.4	2.70	40.08	21.4	18.60	14.98	21.5	48.13	21.
22.3	31.53	42.52	22.3	13.78	27.12	22.3	2.58	40.24	22.4	18.34	15.23	22.5	48.25	21.
23.3	30.56	42.54	23.3	13.67	27.23	23.3	2.46	40.40	23.4	18.07	15.49	23.5	48.38	22.
24.3	29.53	42.55	24.3	13.55	27.34	24.3	2.34	40.58	24.4	17.78	15.76	24.5	48.51	22.
25.3	28.43	42.55	25.3	13.41	27.45	25.3	2.19	40.76	25.4	17.45	16.04	25.5	48.62	22.
26.2	27.28	42.54	26.3	13.27	27.55	26.3	2.03	40.93	26.4	17.07	16.33	26.5	48.70	23.
27.2	26.08	42.49	27.3	13.12	27.62	27.3	1.86	41.08	27.4	16.63	16.61	27.5	48.75	23.
28.2	24.91	42.42	28.3	12.97	27.66	28.3	1.69	41.20	28.4	16.13	16.87	28.5	48.74	23.
29.2	23.77	42.32	29.3	12.82	27.67	29.3	1.52	41.29	29.4	15.60	17.10	29.5	48.69	24.
30.2	22.70	42.20	30.3	12.67	27.66	30.3	1.35	41.36	30.4	15.07	17.31	30.5	48.62	24.
31.2	21.72	42.07	31.3	12.54	27.64	31.3	1.19	41.41	31.4	14.55	17.49	31.5	48.54	24.
	51.86	+51.85		6.93	+6.86		8.20	+8.14		31.32	+31.30		23.44	+23.4
	$8^h\ 13^m$	$47^s.916$		$9^h\ 25^m$	$4^s.133$		$10^h\ 20^m$	$49^s.679$		$12^h\ 14^m$	$27^s.688$		$15^h\ 4^m$	$20^s.1$
	+88° 53′	22″.50		+81° 42′	12″.85		+82° 59′	30″.46		+88° 10′	15″.98		+87° 33′	38″.3

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

oombridge 1119. Mag. 7.0			1 H. Draconis. Mag. 4.6			30 H. Camelop. Mag. 5.3			Bradley 1672. Mag. 6.3			Groombridge 2283. Mag. 7.2		
ean olar ate.	Right Ascension.	Declination *North*.	Mean Solar Date.	Right Ascension.	Declination *North*.	Mean Solar Date.	Right Ascension.	Declination *North*.	Mean Solar Date.	Right Ascension.	Declination *North*.	Mean Solar Date.	Right Ascension.	Declination *North*.
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
ay	8 13	+88 53	May	9 25	+81 42	May	10 20	+82 59	May	12 14	+88 10	May	15 4	+87 33
	s	"		s	"		s	"		s	"		s	"
0.2	82.70	42.20	0.3	12.67	27.66	0.3	61.35	41.36	0.4	75.07	17.31	0.5	48.62	24.40
1.2	81.72	42.07	1.3	12.54	27.64	1.3	61.19	41.41	1.4	74.55	17.49	1.5	48.54	24.71
2.2	80.83	41.95	2.3	12.41	27.62	2.3	61.04	41.45	2.4	74.09	17.66	2.5	48.45	24.99
3.2	79.98	41.84	3.3	12.29	27.60	3.3	60.91	41.50	3.4	73.66	17.83	3.5	48.38	25.26
4.2	79.15	41.76	4.3	12.18	27.61	4.3	60.78	41.57	4.4	73.27	18.00	4.5	48.36	25.51
5.2	78.30	41.70	5.3	12.07	27.64	5.3	60.65	41.66	5.4	72.90	18.19	5.5	48.36	25.78
6.2	77.39	41.64	6.3	11.95	27.67	6.3	60.52	41.76	6.4	72.52	18.39	6.5	48.37	26.06
7.2	76.41	41.58	7.3	11.83	27.72	7.3	60.38	41.87	7.4	72.12	18.62	7.5	48.39	26.36
8.2	75.36	41.51	8.3	11.70	27.76	8.3	60.22	41.98	8.4	71.67	18.85	8.5	48.38	26.69
9.2	74.25	41.42	9.3	11.55	27.78	9.3	60.06	42.08	9.4	71.17	19.09	9.5	48.35	27.03
10.2	73.15	41.31	10.3	11.40	27.79	10.3	59.88	42.16	10.4	70.62	19.31	10.5	48.29	27.37
11.2	72.04	41.17	11.3	11.24	27.77	11.3	59.69	42.23	11.4	70.04	19.53	11.5	48.19	27.73
12.2	70.97	41.02	12.3	11.10	27.72	12.3	59.51	42.27	12.4	69.43	19.72	12.5	48.06	28.07
13.2	69.95	40.85	13.3	10.95	27.66	13.3	59.33	42.28	13.4	68.81	19.90	13.5	47.90	28.40
14.2	68.98	40.67	14.2	10.81	27.59	14.3	59.16	42.28	14.4	68.20	20.06	14.5	47.72	28.71
15.2	68.07	40.49	15.2	10.68	27.51	15.3	58.99	42.28	15.4	67.60	20.20	15.5	47.54	29.01
16.2	67.23	40.30	16.2	10.55	27.44	16.3	58.83	42.27	16.4	67.02	20.33	16.5	47.36	29.29
17.2	66.43	40.13	17.2	10.44	27.36	17.3	58.68	42.26	17.4	66.48	20.45	17.5	47.18	29.56
18.2	65.66	39.98	18.2	10.32	27.28	18.3	58.54	42.26	18.4	65.97	20.56	18.5	47.02	29.82
19.2	64.89	39.83	19.2	10.21	27.22	19.3	58.40	42.26	19.4	65.48	20.68	19.5	46.89	30.08
20.2	64.11	39.68	20.2	10.11	27.18	20.3	58.27	42.28	20.4	65.00	20.82	20.5	46.76	30.34
21.2	63.30	39.55	21.2	9.99	27.14	21.3	58.12	42.30	21.3	64.51	20.96	21.5	46.64	30.61
22.2	62.42	39.40	22.2	9.86	27.09	22.3	57.97	42.32	22.3	63.98	21.11	22.5	46.51	30.90
23.2	61.50	39.25	23.2	9.73	27.04	23.3	57.81	42.34	23.3	63.40	21.27	23.5	46.37	31.21
24.2	60.55	39.07	24.2	9.60	26.97	24.3	57.64	42.35	24.3	62.78	21.43	24.5	46.19	31.52
25.2	59.60	38.86	25.2	9.46	26.87	25.3	57.46	42.33	25.3	62.11	21.57	25.5	45.96	31.85
26.2	58.67	38.62	26.2	9.32	26.74	26.3	57.27	42.27	26.3	61.40	21.68	26.5	45.68	32.17
27.2	57.81	38.36	27.2	9.18	26.58	27.3	57.09	42.19	27.3	60.67	21.76	27.5	45.37	32.47
28.2	57.06	38.09	28.2	9.06	26.41	28.3	56.92	42.10	28.3	59.96	21.82	28.4	45.04	32.74
29.2	56.39	37.82	29.2	8.94	26.24	29.2	56.77	41.99	29.3	59.29	21.86	29.4	44.71	32.98
30.2	55.80	37.58	30.2	8.84	26.07	30.2	56.63	41.88	30.3	58.67	21.89	30.4	44.40	33.21
31.2	55.27	37.34	31.2	8.74	25.91	31.2	56.50	41.78	31.3	58.10	21.92	31.4	44.11	33.42
	51.84	+51.83		6.93	+6.86		8.20	+8.14		31.35	+31.34		23.47	+23.45
	$8^h\ 13^m$	$47^s.916$		$9^h\ 25^m$	$4^s.133$		$10^h\ 20^m$	$49^s.679$		$12^h\ 14^m$	$27^s.688$		$15^h\ 4^m$	$20^s.10$
	+88° 53'	22''.50		+81° 42'	12''.85		+82° 59'	30''.46		+88° 10'	15''.98		+87° 33'	38''.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge** Mag. 7.2		
Mean Solar Date.	**Right Ascension.**	**Declination *North.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *North.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *North.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *North.***	**Mean Solar Date.**	**Right Ascension.**	**D**
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	
June	8 13	+88 53	June	9 25	+81 42	June	10 20	+82 59	June	12 14	+88 10	June	15 4	+8
	s	″		s	″		s	″		s	″		s	
0.2	55.27	37.34	0.2	8.74	25.91	0.2	56.50	41.78	0.3	58.10	21.92	0.4	44.11	3
1.2	54.73	37.13	1.2	8.64	25.78	1.2	56.37	41.70	1.3	57.56	21.95	1.4	43.86	3
2.1	54.14	36.93	2.2	8.55	25.66	2.2	56.24	41.64	2.3	57.03	22.01	2.4	43.64	3
3.1	53.50	36.73	3.2	8.46	25.55	3.2	56.11	41.59	3.3	56.49	22.09	3.4	43.42	34
4.1	52.80	36.53	4.2	8.35	25.44	4.2	55.97	41.54	4.3	55.91	22.17	4.4	43.18	34
5.1	52.04	36.32	5.2	8.23	25.32	5.2	55.81	41.49	5.3	55.29	22.26	5.4	42.93	34
6.1	51.26	36.09	6.2	8.10	25.18	6.2	55.65	41.42	6.3	54.63	22.35	6.4	42.65	34
7.1	50.48	35.84	7.2	7.97	25.02	7.2	55.47	41.34	7.3	53.92	22.42	7.4	42.33	35
8.1	49.72	35.56	8.2	7.85	24.84	8.2	55.30	41.24	8.3	53.19	22.48	8.4	41.99	35
9.1	49.03	35.27	9.2	7.74	24.65	9.2	55.14	41.11	9.3	52.45	22.51	9.4	41.61	35
10.1	48.39	34.96	10.2	7.62	24.44	10.2	54.97	40.96	10.3	51.73	22.52	10.4	41.22	35
11.1	47.82	34.66	11.2	7.52	24.22	11.2	54.81	40.80	11.3	51.02	22.52	11.4	40.82	36
12.1	47.33	34.36	12.2	7.42	23.99	12.2	54.67	40.63	12.3	50.33	22.50	12.4	40.41	36
13.1	46.87	34.06	13.2	7.33	23.77	13.2	54.54	40.47	13.3	49.67	22.47	13.4	40.02	36
14.1	46.48	33.78	14.2	7.25	23.56	14.2	54.42	40.31	14.3	49.05	22.44	14.4	39.65	36
15.1	46.10	33.52	15.2	7.17	23.36	15.2	54.30	40.16	15.3	48.46	22.41	15.4	39.29	36
16.1	45.72	33.26	16.2	7.10	23.17	16.2	54.18	40.02	16.3	47.89	22.38	16.4	38.95	37
17.1	45.32	33.02	17.2	7.02	22.99	17.2	54.06	39.88	17.3	47.31	22.36	17.4	38.62	37
18.1	44.87	32.77	18.2	6.94	22.82	18.2	53.94	39.76	18.3	46.73	22.36	18.4	38.30	37
19.1	44.37	32.52	19.2	6.85	22.64	19.2	53.81	39.64	19.3	46.11	22.37	19.4	37.97	37
20.1	43.84	32.24	20.1	6.74	22.44	20.2	53.67	39.50	20.3	45.45	22.38	20.4	37.60	37
21.1	43.29	31.94	21.1	6.64	22.22	21.2	53.52	39.34	21.3	44.73	22.37	21.4	37.19	38
22.1	42.77	31.62	22.1	6.54	21.98	22.2	53.36	39.16	22.3	43.98	22.35	22.4	36.74	38
23.1	42.30	31.27	23.1	6.44	21.71	23.2	53.21	38.95	23.3	43.21	22.29	23.4	36.25	38
24.1	41.94	30.90	24.1	6.35	21.42	24.2	53.06	38.71	24.3	42.45	22.20	24.4	35.74	38
25.1	41.67	30.54	25.1	6.27	21.12	25.2	52.93	38.46	25.3	41.72	22.09	25.4	35.23	38
26.1	41.51	30.19	26.1	6.22	20.82	26.2	52.82	38.20	26.2	41.04	21.96	26.4	34.72	39
27.1	41.41	29.86	27.1	6.17	20.54	27.2	52.72	37.96	27.2	40.43	21.83	27.4	34.24	39
28.1	41.31	29.55	28.1	6.12	20.27	28.2	52.63	37.74	28.2	39.85	21.71	28.4	33.80	39
29.1	41.21	29.26	29.1	6.08	20.03	29.2	52.54	37.53	29.2	39.30	21.60	29.4	33.39	39
30.1	41.04	28.98	30.1	6.02	19.79	30.2	52.44	37.33	30.2	38.74	21.50	30.4	32.99	39
31.1	40.84	28.71	31.1	5.97	19.57	31.2	52.34	37.15	31.2	38.17	21.43	31.4	32.59	39
51.74		+51.74	6.93		+6.86	8.20		+8.14	31.36		+31.35	23.49		+23.4
8^h 13^m		$47^s.916$	9^h 25^m		$4^s.133$	10^h 20^m		$49^s.679$	12^h 14^m		$27^s.688$	15^h 4^m		$20^s.1$
+88° 53′		22″.50	+81° 42′		12″.85	+82° 59′		30″.46	+88° 10′		15″.98	+87° 33′		38″.3

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ombridge 1119. Mag. 7.0			**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge 2283.** Mag. 7.2		
an ar te.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
ly	8 13	+88 53	July	9 25	+81 42	July	10 20	+82 59	July	12 14	+88 10	July	15 4	+87 33
	s	"		s	"		s	"		s	"		s	"
.1	40.84	28.71	1.1	5.97	19.57	1.2	52.34	37.15	1.2	38.17	21.43	1.4	32.59	39.68
.1	40.56	28.43	2.1	5.90	19.34	2.2	52.23	36.96	2.2	37.57	21.37	2.4	32.19	39.83
.1	40.25	28.12	3.1	5.83	19.10	3.2	52.11	36.77	3.2	36.92	21.30	3.3	31.76	39.99
.1	39.94	27.80	4.1	5.75	18.84	4.1	51.98	36.56	4.2	36.23	21.22	4.3	31.29	40.16
.1	39.63	27.45	5.1	5.67	18.56	5.1	51.85	36.33	5.2	35.52	21.13	5.3	30.80	40.33
.1	39.38	27.10	6.1	5.60	18.25	6.1	51.72	36.07	6.2	34.80	21.02	6.3	30.27	40.49
.1	39.20	26.73	7.1	5.53	17.94	7.1	51.60	35.80	7.2	34.08	20.89	7.3	29.73	40.62
.0	39.08	26.37	8.1	5.48	17.61	8.1	51.49	35.52	8.2	33.38	20.73	8.3	29.19	40.74
.0	39.05	26.00	9.1	5.43	17.29	9.1	51.39	35.23	9.2	32.71	20.57	9.3	28.64	40.84
.0	39.07	25.64	10.1	5.39	16.97	10.1	51.30	34.94	10.2	32.08	20.39	10.3	28.11	40.92
.0	39.14	25.30	11.1	5.37	16.66	11.1	51.22	34.66	11.2	31.49	20.20	11.3	27.59	40.98
.0	39.25	24.96	12.1	5.34	16.36	12.1	51.15	34.38	12.2	30.93	20.01	12.3	27.09	41.03
.0	39.37	24.65	13.1	5.32	16.07	13.1	51.09	34.12	13.2	30.40	19.84	13.3	26.61	41.07
.0	39.47	24.35	14.1	5.30	15.79	14.1	51.02	33.86	14.2	29.88	19.67	14.3	26.15	41.12
5.0	39.53	24.05	15.1	5.28	15.52	15.1	50.95	33.61	15.2	29.36	19.52	15.3	25.69	41.18
6.0	39.54	23.76	16.1	5.25	15.26	16.1	50.87	33.37	16.2	28.82	19.37	16.3	25.24	41.26
7.0	39.51	23.45	17.1	5.21	14.98	17.1	50.78	33.12	17.2	28.24	19.22	17.3	24.77	41.35
8.0	39.46	23.11	18.1	5.16	14.69	18.1	50.69	32.86	18.2	27.62	19.08	18.3	24.26	41.45
9.0	39.40	22.74	19.1	5.11	14.37	19.1	50.59	32.58	19.2	26.95	18.92	19.3	23.71	41.55
0.0	39.40	22.36	20.1	5.07	14.03	20.1	50.49	32.27	20.2	26.27	18.73	20.3	23.13	41.64
1.0	39.49	21.97	21.1	5.03	13.67	21.1	50.40	31.94	21.2	25.58	18.52	21.3	22.52	41.70
2.0	39.67	21.58	22.1	5.01	13.29	22.1	50.32	31.59	22.2	24.92	18.27	22.3	21.89	41.73
3.0	39.97	21.19	23.1	5.00	12.91	23.1	50.25	31.23	23.2	24.31	18.01	23.3	21.27	41.73
4.0	40.33	20.82	24.1	4.99	12.54	24.1	50.21	30.87	24.2	23.76	17.74	24.3	20.69	41.71
15.0	40.74	20.47	25.1	5.00	12.19	25.1	50.17	30.54	25.2	23.27	17.47	25.3	20.14	41.68
5.9	41.15	20.15	26.0	5.02	11.87	26.1	50.14	30.21	26.2	22.81	17.21	26.3	19.63	41.65
6.9	41.52	19.84	27.0	5.03	11.57	27.1	50.11	29.91	27.2	22.38	16.98	27.3	19.14	41.62
7.9	41.83	19.54	28.0	5.03	11.27	28.1	50.07	29.63	28.2	21.93	16.75	28.3	18.66	41.60
8.9	42.07	19.24	29.0	5.03	10.97	29.1	50.02	29.35	29.2	21.46	16.55	29.3	18.17	41.61
9.9	42.27	18.93	30.0	5.02	10.67	30.1	49.96	29.06	30.2	20.94	16.34	30.3	17.67	41.63
0.9	42.46	18.59	31.0	5.00	10.36	31.1	49.90	28.76	31.2	20.39	16.14	31.3	17.15	41.66
1.9	42.65	18.24	32.0	4.98	10.02	32.1	49.83	28.44	32.2	19.81	15.92	32.3	16.59	41.70
	51.62	+51.61		6.93	+6.86		8.20	+8.14		31.35	+31.33		23.50	+23.48
	8^h 13^m	$47^s.916$		9^h 25^m	$4^s.133$		10^h 20^m	$49^s.679$		12^h 14^m	$27^s.688$		15^h 4^m	$20^s.10$
	+88° 53'	22''.50		+81° 42'	12''.85		+82° 59'	30''.46		+88° 10'	15''.98		+87° 33'	38''.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119.			**1 H. Draconis.**			**30 H. Camelop.**			**Bradley 1672.**			**Groombridge**		
Mag. 7.0			Mag. 4.6			Mag. 5.3			Mag. 6.3			Mag. 7.2		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	
	h m	° '		h m	° '		h m	° '		h m	° '		h m	°
Aug.	8 13	+88 53	Aug.	9 25	+81 41	Aug.	10 20	+82 59	Aug.	12 14	+88 10	Aug.	15 3	+87
	s	''		s	''		s	''		s	''		s	''
0.9	42.65	18.24	1.0	4.98	70.02	1.1	49.83	28.44	1.2	19.81	15.92	1.3	76.59	41.7
1.9	42.88	17.86	2.0	4.97	69.67	2.1	49.77	28.11	2.1	19.22	15.68	2.3	76.01	41.7
2.9	43.17	17.49	3.0	4.97	69.30	3.1	49.71	27.77	3.1	18.63	15.42	3.3	75.41	41.7
3.9	43.53	17.11	4.0	4.97	68.93	4.1	49.65	27.40	4.1	18.05	15.14	4.3	74.80	41.7
4.9	43.95	16.74	5.0	4.98	68.56	5.1	49.61	27.03	5.1	17.51	14.85	5.3	74.20	41.6
5.9	44.45	16.37	6.0	4.99	68.18	6.1	49.59	26.66	6.1	17.01	14.55	6.3	73.60	41.6
6.9	44.99	16.02	7.0	5.02	67.81	7.1	49.57	26.29	7.1	16.55	14.24	7.3	73.01	41.5
7.9	45.58	15.69	8.0	5.06	67.45	8.1	49.56	25.93	8.1	16.13	13.93	8.2	72.45	41.4
8.9	46.18	15.36	9.0	5.09	67.11	9.1	49.55	25.58	9.1	15.74	13.62	9.2	71.92	41.3
9.9	46.78	15.05	10.0	5.13	66.78	10.0	49.55	25.24	10.1	15.38	13.32	10.2	71.41	41.
10.9	47.36	14.76	11.0	5.17	66.47	11.0	49.55	24.92	11.1	15.02	13.04	11.2	70.91	41.
11.9	47.87	14.47	12.0	5.21	66.16	12.0	49.54	24.61	12.1	14.65	12.77	12.2	70.42	41.0
12.9	48.34	14.18	13.0	5.23	65.85	13.0	49.53	24.30	13.1	14.26	12.51	13.2	69.92	41.
13.9	48.77	13.87	13.9	5.25	65.53	14.0	49.50	23.99	14.1	13.82	12.25	14.2	69.40	40.
14.9	49.20	13.53	14.9	5.27	65.19	15.0	49.47	23.65	15.1	13.34	11.98	15.2	68.84	40.
15.9	49.65	13.18	15.9	5.29	64.83	16.0	49.43	23.29	16.1	12.84	11.69	16.2	68.25	40.
16.9	50.17	12.80	16.9	5.31	64.44	17.0	49.41	22.90	17.1	12.32	11.38	17.2	67.63	40.
17.9	50.78	12.43	17.9	5.34	64.04	18.0	49.39	22.50	18.1	11.83	11.03	18.2	67.00	40.
18.9	51.50	12.06	18.9	5.38	63.64	19.0	49.39	22.09	19.1	11.39	10.67	19.2	66.37	40.
19.9	52.30	11.71	19.9	5.44	63.24	20.0	49.40	21.68	20.1	11.00	10.30	20.2	65.76	40.4
20.9	53.16	11.37	20.9	5.52	62.86	21.0	49.43	21.28	21.1	10.68	9.92	21.2	65.19	40.2
21.9	54.03	11.07	21.9	5.59	62.51	22.0	49.47	20.90	22.1	10.40	9.55	22.2	64.66	40.1
22.9	54.88	10.79	22.9	5.66	62.18	23.0	49.51	20.54	23.1	10.16	9.21	23.2	64.16	39.9
23.9	55.67	10.52	23.9	5.73	61.87	24.0	49.54	20.21	24.1	9.91	8.88	24.2	63.68	39.7
24.9	56.39	10.26	24.9	5.79	61.57	25.0	49.57	19.88	25.1	9.65	8.57	25.2	63.21	39.6
25.9	57.04	9.98	25.9	5.84	61.25	26.0	49.58	19.55	26.1	9.34	8.27	26.2	62.72	39.5
26.9	57.69	9.69	26.9	5.89	60.93	27.0	49.59	19.22	27.1	9.02	7.97	27.2	62.22	39.4
27.9	58.32	9.39	27.9	5.93	60.59	27.9	49.59	18.87	28.1	8.65	7.65	28.2	61.69	39.3
28.9	58.98	9.07	28.9	5.98	60.24	28.9	49.60	18.50	29.1	8.27	7.33	29.2	61.14	39.1
29.9	59.68	8.74	29.9	6.03	59.87	29.9	49.60	18.12	30.1	7.89	6.99	30.2	60.57	39.0
30.9	60.45	8.40	30.9	6.09	59.49	30.9	49.62	17.73	31.1	7.53	6.63	31.2	59.98	38.9
31.9	61.28	8.07	31.9	6.16	59.12	31.9	49.64	17.33	32.1	7.20	6.25	32.2	59.40	38.7
	51.48	+51.47		6.93	+6.86		8.19	+8.13		31.31	+31.30		23.50	+23.48
	$8^h\ 13^m$	$47^s.916$		$9^h\ 25^m$	$4^s.133$		$10^h\ 20^m$	$49^s.679$		$12^h\ 14^m$	$27^s.688$		$15^h\ 4^m$	$20^s.10$
	+88° 53′	22″.50		+81° 42′	12″.85		+82° 59′	30″.46		+88° 10′	15″.98		+87° 33′	38″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ombridge 1119.			1 H. Draconis.			30 H. Camelop.			Bradley 1672.			Groombridge 2283.		
Mag. 7.0			Mag. 4.6			Mag. 5.3			Mag. 6.3			Mag. 7.2		
an lar te.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
pt.	8 14	+88 53	Sept.	9 25	+81 41	Sept.	10 20	+82 59	Sept.	12 14	+88 9	Sept.	15 3	+87 33
	s	″		s	″		s	″		s	″		s	″
.9	1.28	8.07	0.9	6.16	59.12	0.9	49.64	17.33	1.1	7.20	66.25	1.2	59.40	38.76
.9	2.18	7.75	1.9	6.23	58.75	1.9	49.67	16.93	2.1	6.90	65.86	2.2	58.83	38.57
.9	3.13	7.44	2.9	6.32	58.38	2.9	49.72	16.53	3.1	6.64	65.47	3.2	58.27	38.36
.9	4.12	7.15	3.9	6.41	58.03	3.9	49.78	16.14	4.1	6.43	65.08	4.2	57.74	38.14
.9	5.13	6.88	4.9	6.51	57.69	4.9	49.85	15.77	5.1	6.26	64.69	5.2	57.24	37.91
.9	6.14	6.63	5.9	6.61	57.37	5.9	49.92	15.41	6.1	6.12	64.31	6.2	56.77	37.69
.9	7.13	6.39	6.9	6.71	57.06	6.9	49.99	15.06	7.0	5.99	63.95	7.2	56.32	37.46
.9	8.08	6.15	7.9	6.81	56.76	7.9	50.05	14.72	8.0	5.86	63.60	8.2	55.88	37.25
.9	8.98	5.92	8.9	6.90	56.47	8.9	50.12	14.39	9.0	5.71	63.26	9.2	55.43	37.05
.9	9.82	5.68	9.9	6.98	56.17	9.9	50.17	14.06	10.0	5.52	62.93	10.2	54.98	36.87
.9	10.64	5.41	10.9	7.05	55.85	10.9	50.21	13.72	11.0	5.30	62.59	11.2	54.50	36.69
.9	11.47	5.14	11.9	7.12	55.52	11.9	50.24	13.36	12.0	5.05	62.24	12.2	53.99	36.52
.9	12.34	4.84	12.9	7.20	55.16	12.9	50.28	12.97	13.0	4.78	61.86	13.2	53.44	36.34
.9	13.31	4.53	13.9	7.28	54.78	13.9	50.33	12.56	14.0	4.52	61.46	14.1	52.88	36.13
.9	14.35	4.22	14.9	7.38	54.40	14.9	50.39	12.14	15.0	4.30	61.05	15.1	52.32	35.89
5.9	15.48	3.93	15.9	7.49	54.03	15.9	50.46	11.73	16.0	4.13	60.62	16.1	51.78	35.62
6.9	16.69	3.66	16.9	7.61	53.68	16.9	50.56	11.32	17.0	4.03	60.18	17.1	51.27	35.33
7.9	17.93	3.43	17.9	7.74	53.35	17.9	50.67	10.94	18.0	4.00	59.76	18.1	50.80	35.04
8.9	19.15	3.22	18.9	7.88	53.05	18.9	50.78	10.59	19.0	3.99	59.36	19.1	50.38	34.74
9.8	20.30	3.02	19.9	8.00	52.76	19.9	50.88	10.25	20.0	4.00	58.98	20.1	49.98	34.46
0.8	21.40	2.84	20.9	8.12	52.49	20.9	50.98	9.93	21.0	4.01	58.61	21.1	49.60	34.19
1.8	22.41	2.65	21.9	8.23	52.23	21.9	51.07	9.62	22.0	3.98	58.26	22.1	49.22	33.95
2.8	23.40	2.46	22.9	8.33	51.95	22.9	51.15	9.29	23.0	3.91	57.91	23.1	48.82	33.72
3.8	24.35	2.24	23.9	8.43	51.67	23.9	51.22	8.96	24.0	3.82	57.56	24.1	48.40	33.50
4.8	25.32	2.01	24.9	8.53	51.37	24.9	51.30	8.62	24.9	3.70	57.20	25.1	47.95	33.27
5.8	26.32	1.77	25.9	8.63	51.06	25.9	51.37	8.27	25.9	3.57	56.82	26.1	47.48	33.03
6.8	27.38	1.53	26.9	8.74	50.73	26.9	51.45	7.90	26.9	3.47	56.43	27.1	47.01	32.77
7.8	28.51	1.28	27.9	8.85	50.40	27.9	51.54	7.52	27.9	3.39	56.03	28.1	46.54	32.50
8.8	29.69	1.05	28.9	8.97	50.08	28.9	51.65	7.14	28.9	3.33	55.61	29.1	46.08	32.22
9.8	30.92	0.83	29.9	9.10	49.76	29.9	51.76	6.77	29.9	3.33	55.19	30.1	45.64	31.91
0.8	32.19	0.63	30.9	9.25	49.45	30.9	51.88	6.41	30.9	3.37	54.77	31.1	45.22	31.59
1.8	33.49	0.45	31.9	9.39	49.17	31.9	52.01	6.06	31.9	3.45	54.35	32.1	44.84	31.25
	51.36	+51.35		6.92	+6.85		8.19	+8.13		31.26	+31.25		23.49	+23.47
	$8^h\ 13^m$	$47^s.916$		$9^h\ 25^m$	$4^s.133$		$10^h\ 20^m$	$49^s.679$		$12^h\ 14^m$	$27^s.688$		$15^h\ 4^m$	$20^s.10$
	$88^\circ\ 53'$	$22''.50$		$+81^\circ\ 42'$	$12''.85$		$+82^\circ\ 59'$	$30''.46$		$+88^\circ\ 10'$	$15''.98$		$+87^\circ\ 33'$	$38''.31$

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119. Mag. 7.0			**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge** Mag. 7.2		
Mean Solar Date.	Right Ascension.	Declination *North*.	Mean Solar Date.	Right Ascension.	Declination *North*.	Mean Solar Date.	Right Ascension.	Declination *North*.	Mean Solar Date.	Right Ascension.	Declination *North*.	Mean Solar Date.	Right Ascension.	Declination *North*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Oct.	8 14	+88 52	Oct.	9 25	+81 41	Oct.	10 20	+82 58	Oct.	12 14	+88 9	Oct.	15 3	+87
	s	″		s	″		s	″		s	″		s	″
0.8	32.19	60.63	0.9	9.25	49.45	0.9	51.88	66.41	0.9	3.37	54.77	1.1	45.22	31.5
1.8	33.49	60.45	1.9	9.39	49.17	1.9	52.01	66.06	1.9	3.45	54.35	2.1	44.84	31.2
2.8	34.80	60.29	2.9	9.54	48.90	2.9	52.14	65.72	2.9	3.57	53.94	3.1	44.48	30.
3.8	36.07	60.15	3.9	9.68	48.65	3.9	52.28	65.41	3.9	3.70	53.55	4.1	44.15	30.5
4.8	37.31	60.01	4.9	9.84	48.42	4.9	52.42	65.11	4.9	3.85	53.18	5.1	43.83	30.
5.8	38.50	59.88	5.9	9.98	48.19	5.9	52.55	64.82	5.9	3.98	52.81	6.1	43.52	29.
6.8	39.63	59.74	6.9	10.11	47.96	6.9	52.67	64.53	6.9	4.08	52.46	7.1	43.22	29.
7.8	40.71	59.60	7.9	10.24	47.72	7.9	52.78	64.24	7.9	4.14	52.11	8.1	42.89	29.
8.8	41.80	59.43	8.8	10.36	47.45	8.9	52.89	63.93	8.9	4.17	51.75	9.1	42.53	29.
9.8	42.90	59.25	9.8	10.48	47.18	9.9	52.99	63.60	9.9	4.18	51.38	10.1	42.14	28.
10.8	44.06	59.05	10.8	10.61	46.89	10.9	53.10	63.25	10.9	4.18	50.98	11.1	41.73	28.
11.8	45.30	58.85	11.8	10.75	46.58	11.9	53.22	62.89	11.9	4.22	50.57	12.1	41.31	28.2
12.8	46.64	58.66	12.8	10.91	46.28	12.9	53.35	62.52	12.9	4.31	50.14	13.1	40.91	27.
13.8	48.05	58.49	13.8	11.07	46.00	13.9	53.51	62.17	13.9	4.45	49.70	14.1	40.54	27.
14.8	49.50	58.35	14.8	11.25	45.74	14.9	53.67	61.83	14.9	4.66	49.27	15.1	40.21	27.
15.8	50.92	58.24	15.8	11.42	45.50	15.9	53.84	61.52	15.9	4.91	48.86	16.1	39.93	26.73
16.8	52.31	58.16	16.8	11.59	45.30	16.9	54.01	61.24	16.9	5.20	48.47	17.1	39.69	26.3
17.8	53.65	58.09	17.8	11.75	45.12	17.9	54.18	60.97	17.9	5.50	48.11	18.1	39.47	25.9
18.8	54.89	58.03	18.8	11.91	44.94	18.9	54.33	60.72	18.9	5.77	47.77	19.1	39.26	25.6
19.8	56.07	57.95	19.8	12.06	44.76	19.9	54.48	60.48	19.9	6.00	47.43	20.0	39.04	25.34
20.8	57.20	57.87	20.8	12.20	44.57	20.9	54.61	60.23	20.9	6.20	47.10	21.0	38.81	25.05
21.8	58.33	57.76	21.8	12.34	44.37	21.9	54.74	59.96	21.9	6.36	46.77	22.0	38.55	24.73
22.8	59.48	57.65	22.8	12.48	44.15	22.8	54.88	59.68	22.9	6.52	46.42	23.0	38.28	24.42
23.8	60.67	57.53	23.8	12.62	43.92	23.8	55.02	59.39	23.9	6.68	46.05	24.0	37.99	24.10
24.8	61.92	57.41	24.8	12.77	43.69	24.8	55.16	59.09	24.9	6.85	45.67	25.0	37.70	23.76
25.8	63.22	57.30	25.8	12.93	43.47	25.8	55.31	58.79	25.9	7.07	45.28	26.0	37.41	23.40
26.7	64.58	57.20	26.8	13.10	43.25	26.8	55.47	58.50	26.9	7.32	44.89	27.0	37.15	23.03
27.7	65.96	57.13	27.8	13.27	43.04	27.8	55.65	58.21	27.9	7.63	44.50	28.0	36.92	22.64
28.7	67.37	57.07	28.8	13.45	42.85	28.8	55.84	57.95	28.9	7.97	44.12	29.0	36.71	22.25
29.7	68.78	57.03	29.8	13.64	42.69	29.8	56.03	57.70	29.9	8.35	43.75	30.0	36.54	21.85
30.7	70.18	57.01	30.8	13.82	42.54	30.8	56.22	57.46	30.9	8.75	43.39	31.0	36.39	21.46
31.7	71.54	57.01	31.8	14.00	42.41	31.8	56.41	57.25	31.9	9.17	43.05	32.0	36.27	21.08
51.29		+51.28	6.92		+6.85	8.19		+8.13	31.20		+31.19	23.46		+23.44
$8^{h}\ 13^{m}$		$47^{s}.916$	$9^{h}\ 25^{m}$		$4^{s}.133$	$10^{h}\ 20^{m}$		$49^{s}.679$	$12^{h}\ 14^{m}$		$27^{s}.688$	$15^{h}\ 4^{m}$		$20^{s}.10$
+88° 53′		22″.50	+81° 42′		12″.85	+82° 59′		30″.46	+88° 10′		15″.98	+87° 33′		38″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

oombridge 1119. Mag. 7.0			**1 H. Draconis.** Mag. 4.6			**30 H. Camelop.** Mag. 5.3			**Bradley 1672.** Mag. 6.3			**Groombridge 2283.** Mag. 7.2		
ean olar ate.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
ov.	8 15	+88 52	Nov.	9 25	+81 41	Nov.	10 20	+82 58	Nov.	12 14	+88 9	Nov.	15 3	+87 33
	s	''		s	''		s	''		s	''		s	''
0.7	11.54	57.01	0.8	14.00	42.41	0.8	56.41	57.25	0.9	9.17	43.05	1.0	36.27	21.08
1.7	12.83	57.01	1.8	14.18	42.29	1.8	56.59	57.05	1.9	9.58	42.73	2.0	36.17	20.72
2.7	14.06	57.02	2.8	14.35	42.17	2.8	56.76	56.86	2.9	9.96	42.42	3.0	36.07	20.37
3.7	15.25	57.01	3.8	14.50	42.05	3.8	56.93	56.67	3.9	10.32	42.12	4.0	35.95	20.04
4.7	16.39	56.99	4.8	14.65	41.92	4.8	57.09	56.46	4.9	10.64	41.82	5.0	35.82	19.71
5.7	17.55	56.95	5.8	14.81	41.76	5.8	57.24	56.24	5.9	10.92	41.50	6.0	35.65	19.38
6.7	18.74	56.90	6.8	14.97	41.59	6.8	57.40	56.00	6.9	11.20	41.17	7.0	35.45	19.04
7.7	20.01	56.84	7.8	15.13	41.41	7.8	57.56	55.74	7.9	11.50	40.82	7.9	35.25	18.69
8.7	21.35	56.78	8.8	15.30	41.24	8.8	57.74	55.49	8.9	11.83	40.45	8.9	35.06	18.31
9.7	22.76	56.75	9.8	15.49	41.07	9.8	57.93	55.24	9.9	12.21	40.07	9.9	34.90	17.91
0.7	24.22	56.74	10.8	15.69	40.92	10.8	58.14	55.00	10.9	12.67	39.70	10.9	34.77	17.48
1.7	25.69	56.77	11.8	15.89	40.80	11.8	58.35	54.79	11.9	13.18	39.35	11.9	34.70	17.05
2.7	27.13	56.82	12.8	16.09	40.71	12.8	58.57	54.61	12.9	13.72	39.02	12.9	34.67	16.63
3.7	28.47	56.88	13.7	16.28	40.65	13.8	58.78	54.45	13.9	14.27	38.72	13.9	34.66	16.23
4.7	29.73	56.97	14.7	16.46	40.61	14.8	58.98	54.32	14.9	14.81	38.45	14.9	34.68	15.86
5.7	30.91	57.04	15.7	16.63	40.56	15.8	59.17	54.19	15.9	15.31	38.19	15.9	34.70	15.51
16.7	32.04	57.11	16.7	16.79	40.51	16.8	59.35	54.07	16.9	15.79	37.93	16.9	34.70	15.18
17.7	33.13	57.16	17.7	16.95	40.45	17.8	59.52	53.94	17.9	16.22	37.68	17.9	34.68	14.85
18.7	34.24	57.19	18.7	17.11	40.38	18.8	59.69	53.79	18.9	16.63	37.42	18.9	34.64	14.53
19.7	35.36	57.22	19.7	17.27	40.29	19.8	59.86	53.63	19.8	17.04	37.15	19.9	34.59	14.20
20.7	36.53	57.25	20.7	17.44	40.20	20.8	60.04	53.46	20.8	17.46	36.87	20.9	34.54	13.85
21.7	37.75	57.28	21.7	17.61	40.11	21.8	60.23	53.29	21.8	17.91	36.57	21.9	34.50	13.48
22.7	39.01	57.32	22.7	17.78	40.03	22.8	60.42	53.13	22.8	18.39	36.27	22.9	34.46	13.10
23.7	40.31	57.38	23.7	17.97	39.95	23.8	60.63	52.98	23.8	18.92	35.99	23.9	34.45	12.71
24.7	41.61	57.47	24.7	18.15	39.90	24.8	60.84	52.84	24.8	19.49	35.70	24.9	34.48	12.32
25.7	42.92	57.57	25.7	18.35	39.87	25.8	61.06	52.72	25.8	20.09	35.42	25.9	34.54	11.93
26.7	44.22	57.70	26.7	18.55	39.86	26.8	61.28	52.61	26.8	20.72	35.16	26.9	34.63	11.53
27.7	45.46	57.84	27.7	18.73	39.87	27.7	61.50	52.53	27.8	21.37	34.91	27.9	34.74	11.15
28.7	46.65	57.98	28.7	18.92	39.90	28.7	61.72	52.47	28.8	22.01	34.69	28.9	34.88	10.78
29.7	47.77	58.13	29.7	19.09	39.93	29.7	61.92	52.42	29.8	22.64	34.49	29.9	35.03	10.43
30.7	48.81	58.28	30.7	19.26	39.96	30.7	62.11	52.37	30.8	23.23	34.30	30.9	35.17	10.10
31.6	49.82	58.41	31.7	19.42	39.98	31.7	62.30	52.32	31.8	23.78	34.12	31.9	35.28	9.79
51.28		+51.27	6.92		+6.85	8.18		+8.12	31.15		+31.14	23.43		+23.41
8^h	13^m	$47^s.916$	9^h	25^m	$4^s.133$	10^h	20^m	$49^s.679$	12^h	14^m	$27^s.688$	15^h	4^m	$20^s.10$
$+88^\circ$	$53'$	$22''.50$	$+81^\circ$	$42'$	$12''.85$	$+82^\circ$	$59'$	$30''.46$	$+88^\circ$	$10'$	$15''.98$	$+87^\circ$	$33'$	$38''.31$

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Groombridge 1119.			**1 H. Draconis.**			**30 H. Camelop.**			**Bradley 1672.**			**Groombridge**		
Mag. 7.0			Mag. 4.6			Mag. 5.3			Mag. 6.3			Mag. 7.2		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	
Dec.	8 15	+88 52	Dec.	9 25	+81 41	Dec.	10 21	+82 58	Dec.	12 14	+88 9	Dec.	15 3	+87
	s	″		s	″		s	″		s	″		s	
0.7	48.81	58.28	0.7	19.26	39.96	0.7	2.11	52.37	0.8	23.23	34.30	0.9	35.17	10
1.6	49.82	58.41	1.7	19.42	39.98	1.7	2.30	52.32	1.8	23.78	34.12	1.9	35.28	9
2.6	50.81	58.53	2.7	19.57	39.99	2.7	2.47	52.25	2.8	24.29	33.93	2.9	35.37	9
3.6	51.81	58.64	3.7	19.72	39.98	3.7	2.65	52.17	3.8	24.78	33.72	3.9	35.44	9
4.6	52.86	58.73	4.7	19.88	39.96	4.7	2.83	52.08	4.8	25.28	33.49	4.9	35.49	8
5.6	53.98	58.82	5.7	20.04	39.92	5.7	3.02	51.97	5.8	25.80	33.25	5.9	35.54	8
6.6	55.18	58.92	6.7	20.22	39.90	6.7	3.24	51.86	6.8	26.37	33.00	6.9	35.61	8
7.6	56.43	59.04	7.7	20.41	39.89	7.7	3.45	51.77	7.8	27.00	32.76	7.9	35.71	7
8.6	57.68	59.20	8.7	20.60	39.91	8.7	3.68	51.70	8.8	27.69	32.52	8.9	35.86	7
9.6	58.90	59.38	9.7	20.80	39.97	9.7	3.91	51.67	9.8	28.42	32.31	9.9	36.06	6
10.6	60.06	59.59	10.7	20.99	40.05	10.7	4.13	51.66	10.8	29.15	32.13	10.9	36.30	6
11.6	61.12	59.81	11.7	21.17	40.15	11.7	4.35	51.67	11.8	29.88	31.98	11.9	36.56	6
12.6	62.08	60.03	12.7	21.34	40.25	12.7	4.56	51.70	12.8	30.58	31.85	12.9	36.82	5
13.6	62.96	60.24	13.7	21.49	40.36	13.7	4.75	51.74	13.8	31.25	31.74	13.9	37.08	5
14.6	63.80	60.44	14.7	21.63	40.46	14.7	4.93	51.77	14.8	31.86	31.63	14.9	37.31	5
15.6	64.61	60.62	15.7	21.77	40.55	15.7	5.10	51.78	15.8	32.45	31.51	15.9	37.53	5
16.6	65.44	60.79	16.7	21.91	40.63	16.7	5.27	51.79	16.8	33.02	31.39	16.9	37.73	4
17.6	66.29	60.96	17.7	22.05	40.69	17.7	5.45	51.79	17.8	33.60	31.26	17.9	37.92	4
18.6	67.18	61.13	18.7	22.20	40.76	18.7	5.63	51.78	18.8	34.19	31.12	18.9	38.12	4
19.6	68.12	61.31	19.7	22.36	40.82	19.7	5.81	51.78	19.8	34.82	30.97	19.9	38.33	3
20.6	69.07	61.51	20.6	22.52	40.90	20.7	6.01	51.79	20.8	35.47	30.83	20.9	38.55	3
21.6	70.05	61.72	21.6	22.68	41.00	21.7	6.21	51.81	21.8	36.17	30.69	21.9	38.80	3
22.6	71.02	61.95	22.6	22.84	41.12	22.7	6.41	51.85	22.8	36.90	30.56	22.9	39.09	2.
23.6	71.97	62.20	23.6	23.01	41.26	23.7	6.62	51.90	23.8	37.66	30.45	23.9	39.41	2.
24.6	72.87	62.46	24.6	23.17	41.42	24.7	6.83	51.98	24.8	38.42	30.36	24.9	39.76	2.
25.6	73.71	62.74	25.6	23.33	41.58	25.7	7.04	52.07	25.8	39.19	30.29	25.9	40.12	2.
26.6	74.48	63.02	26.6	23.49	41.76	26.7	7.24	52.18	26.7	39.93	30.24	26.9	40.49	1.
27.6	75.17	63.31	27.6	23.62	41.96	27.7	7.42	52.29	27.7	40.65	30.21	27.9	40.88	1.
28.6	75.80	63.58	28.6	23.74	42.14	28.7	7.59	52.41	28.7	41.33	30.20	28.9	41.24	1.
29.6	76.38	63.83	29.6	23.87	42.30	29.7	7.75	52.52	29.7	41.96	30.17	29.9	41.57	1.
30.6	76.96	64.05	30.6	23.98	42.45	30.7	7.90	52.61	30.7	42.56	30.14	30.9	41.88	0.
31.6	77.58	64.27	31.6	24.10	42.59	31.7	8.06	52.69	31.7	43.14	30.10	31.9	42.16	0.
	51.32	+51.31		6.92	+6.85		8.18	+8.12		31.12	+31.11		23.41	+23.3
	$8^{h}\ 13^{m}$	$47^{s}.916$		$9^{h}\ 25^{m}$	$4^{s}.133$		$10^{h}\ 20^{m}$	$49^{s}.679$		$12^{h}\ 14^{m}$	$27^{s}.688$		$15^{h}\ 4^{m}$	$20^{s}.1$
	+88° 53′	22″.50		+81° 42′	12″.85		+82° 59′	30″.46		+88° 10′	15″.98		+87° 33′	38″.3

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
ean lar ate.	**Right Ascension.**	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
an.	16 54	+82 10	Jan.	17 59	+86 36	Jan.	19 3	+89 0	Jan.	20 48	+82 13	Jan.	23 27	+86 50
	s	″		s	″		s	″		s	″		s	″
0.9	28.83	27.10	0.9	14.03	40.49	1.0	23.85	47.52	1.1	37.22	10.73	1.2	28.42	41.13
1.9	28.87	26.73	1.9	13.99	40.12	2.0	23.33	47.18	2.1	37.10	10.46	2.2	27.98	41.11
2.9	28.93	26.35	2.9	13.99	39.73	3.0	22.88	46.83	3.1	36.98	10.18	3.2	27.54	41.07
3.9	29.00	25.98	3.9	14.01	39.34	4.0	22.51	46.46	4.1	36.87	9.88	4.2	27.10	41.00
4.9	29.07	25.61	4.9	14.06	38.97	5.0	22.25	46.10	5.1	36.77	9.57	5.2	26.68	40.91
5.9	29.15	25.27	5.9	14.13	38.61	6.0	22.08	45.74	6.1	36.68	9.25	6.2	26.28	40.79
6.9	29.24	24.95	6.9	14.22	38.27	6.9	22.00	45.40	7.1	36.61	8.95	7.2	25.91	40.67
7.9	29.33	24.65	7.9	14.31	37.96	7.9	21.94	45.09	8.1	36.55	8.66	8.2	25.57	40.55
8.9	29.41	24.38	8.9	14.39	37.67	8.9	21.89	44.80	9.1	36.49	8.40	9.2	25.26	40.45
9.9	29.48	24.12	9.9	14.45	37.39	9.9	21.79	44.52	10.1	36.43	8.15	10.2	24.96	40.36
0.9	29.55	23.86	10.9	14.50	37.11	10.9	21.63	44.25	11.1	36.36	7.91	11.2	24.66	40.28
1.9	29.60	23.58	11.9	14.53	36.82	11.9	21.40	43.98	12.1	36.29	7.68	12.2	24.33	40.22
2.9	29.66	23.28	12.9	14.55	36.51	12.9	21.11	43.68	13.1	36.20	7.44	13.2	23.97	40.16
3.9	29.72	22.95	13.9	14.58	36.18	13.9	20.83	43.36	14.1	36.11	7.16	14.2	23.59	40.09
4.9	29.80	22.61	14.9	14.64	35.82	14.9	20.61	43.01	15.1	36.02	6.86	15.2	23.19	39.99
5.9	29.88	22.27	15.9	14.72	35.45	15.9	20.46	42.64	16.0	35.93	6.54	16.2	22.78	39.87
6.9	29.99	21.94	16.9	14.83	35.09	16.9	20.42	42.27	17.0	35.86	6.20	17.2	22.37	39.72
7.9	30.11	21.62	17.9	14.97	34.74	17.9	20.49	41.90	18.0	35.80	5.85	18.2	21.99	39.55
8.9	30.23	21.32	18.9	15.13	34.40	18.9	20.67	41.54	19.0	35.75	5.50	19.1	21.63	39.36
9.9	30.35	21.05	19.9	15.31	34.09	19.9	20.90	41.20	20.0	35.71	5.16	20.1	21.31	39.16
0.9	30.47	20.80	20.9	15.50	33.79	20.9	21.18	40.89	21.0	35.68	4.83	21.1	21.01	38.96
1.9	30.59	20.57	21.9	15.68	33.51	21.9	21.46	40.59	22.0	35.67	4.52	22.1	20.72	38.76
2.9	30.70	20.34	22.9	15.85	33.25	22.9	21.74	40.30	23.0	35.65	4.23	23.1	20.45	38.58
3.9	30.81	20.12	23.9	16.01	33.00	23.9	21.99	40.02	24.0	35.62	3.94	24.1	20.19	38.41
4.9	30.91	19.91	24.9	16.17	32.74	24.9	22.21	39.74	25.0	35.59	3.65	25.1	19.93	38.24
5.9	31.02	19.68	25.9	16.31	32.48	25.9	22.37	39.46	26.0	35.56	3.37	26.1	19.65	38.08
6.9	31.12	19.44	26.9	16.45	32.20	26.9	22.51	39.16	27.0	35.52	3.08	27.1	19.35	37.93
27.9	31.22	19.19	27.9	16.60	31.91	27.9	22.68	38.85	28.0	35.49	2.78	28.1	19.03	37.76
28.9	31.33	18.92	28.9	16.76	31.60	28.9	22.85	38.53	29.0	35.45	2.46	29.1	18.70	37.59
29.8	31.45	18.65	29.9	16.93	31.28	29.9	23.05	38.19	30.0	35.41	2.11	30.1	18.36	37.39
30.8	31.58	18.38	30.9	17.12	30.96	30.9	23.34	37.84	31.0	35.37	1.75	31.1	18.02	37.17
31.8	31.72	18.12	31.9	17.35	30.65	31.9	23.72	37.48	32.0	35.35	1.39	32.1	17.69	36.93
	7.34	+7.27		16.91	+16.88		57.98	+57.98		7.38	+7.32		18.17	+18.14
	16h 54m	37s.997		17h 59m	40s.30		19h 5m	3s.27		20h 48m	48s.820		23h 27m	44s.653
	+82° 10′	44″.05		+86° 36′	51″.19		+89° 0′	51″.13		+82° 13′	2″.89		+86° 50′	19″.16

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Decli nati *Nort*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Feb.	16 54	+82 10	Feb.	17 59	+86 36	Feb.	19 3	+89 0	Feb.	20 48	+82 12	Feb.	23 27	+86 5
	s	″		s	″		s	″		s	″		s	″
0.8	31.72	18.12	0.9	17.35	30.65	0.9	23.72	37.48	1.0	35.35	61.39	1.1	17.69	36.9
1.8	31.87	17.89	1.9	17.59	30.35	1.9	24.21	37.14	2.0	35.34	61.02	2.1	17.39	36.6
2.8	32.02	17.68	2.9	17.86	30.08	2.9	24.78	36.82	2.9	35.34	60.66	3.1	17.12	36.4
3.8	32.17	17.49	3.9	18.13	29.83	3.9	25.40	36.52	3.9	35.36	60.31	4.1	16.89	36.1
4.8	32.32	17.33	4.9	18.40	29.61	4.9	26.03	36.25	4.9	35.39	59.99	5.1	16.69	35.8
5.8	32.46	17.20	5.9	18.66	29.41	5.9	26.64	36.00	5.9	35.41	59.68	6.1	16.50	35.6
6.8	32.59	17.07	6.9	18.89	29.22	6.9	27.19	35.77	6.9	35.43	59.40	7.1	16.32	35.4
7.8	32.71	16.92	7.9	19.10	29.03	7.9	27.65	35.54	7.9	35.44	59.13	8.1	16.12	35.2
8.8	32.83	16.76	8.9	19.29	28.81	8.9	28.06	35.29	8.9	35.44	58.86	9.1	15.91	35.0
9.8	32.95	16.58	9.9	19.49	28.58	9.9	28.45	35.02	9.9	35.43	58.57	10.1	15.67	34.8
10.8	33.07	16.38	10.9	19.70	28.33	10.9	28.86	34.73	10.9	35.43	58.25	11.1	15.41	34.5
11.8	33.21	16.17	11.9	19.94	28.07	11.9	29.35	34.43	11.9	35.42	57.91	12.1	15.14	34.3
12.8	33.37	15.98	12.9	20.20	27.80	12.9	29.93	34.11	12.9	35.43	57.55	13.1	14.88	34.0
13.8	33.53	15.80	13.9	20.49	27.54	13.9	30.61	33.80	13.9	35.45	57.19	14.1	14.64	33.7
14.8	33.70	15.64	14.9	20.81	27.30	14.9	31.39	33.50	14.9	35.48	56.83	15.1	14.42	33.4
15.8	33.87	15.51	15.8	21.15	27.09	15.9	32.23	33.22	15.9	35.53	56.47	16.1	14.23	33.1
16.8	34.04	15.41	16.8	21.49	26.91	16.9	33.13	32.97	16.9	35.59	56.13	17.1	14.08	32.8
17.8	34.20	15.32	17.8	21.82	26.75	17.9	34.04	32.73	17.9	35.65	55.82	18.1	13.95	32.5
18.8	34.36	15.25	18.8	22.15	26.60	18.9	34.94	32.51	18.9	35.71	55.52	19.1	13.84	32.2
19.8	34.52	15.19	19.8	22.46	26.46	19.9	35.81	32.31	19.9	35.77	55.23	20.1	13.73	31.9
20.8	34.66	15.13	20.8	22.77	26.33	20.9	36.65	32.11	20.9	35.83	54.95	21.1	13.63	31.6
21.8	34.80	15.07	21.8	23.06	26.19	21.9	37.45	31.91	21.9	35.88	54.69	22.1	13.52	31.3
22.8	34.95	14.99	22.8	23.34	26.05	22.9	38.21	31.71	22.9	35.93	54.42	23.1	13.39	31.1
23.8	35.09	14.90	23.8	23.62	25.89	23.9	38.94	31.50	23.9	35.98	54.14	24.1	13.26	30.8
24.8	35.24	14.81	24.8	23.90	25.73	24.9	39.67	31.27	24.9	36.02	53.84	25.0	13.11	30.5
25.8	35.39	14.70	25.8	24.19	25.55	25.9	40.45	31.04	25.9	36.06	53.54	26.0	12.96	30.3
26.8	35.55	14.60	26.8	24.50	25.37	26.9	41.26	30.79	26.9	36.11	53.22	27.0	12.80	30.0
27.8	35.72	14.50	27.8	24.84	25.20	27.9	42.14	30.53	27.9	36.16	52.89	28.0	12.65	29.6
28.8	35.89	14.43	28.8	25.19	25.03	28.9	43.13	30.29	28.9	36.23	52.56	29.0	12.52	29.3
29.8	36.07	14.38	29.8	25.56	24.88	29.9	44.19	30.07	29.9	36.31	52.23	30.0	12.42	29.0
30.8	36.25	14.36	30.8	25.95	24.76	30.9	45.32	29.87	30.9	36.40	51.92	31.0	12.36	28.6
31.8	36.42	14.36	31.8	26.33	24.68	31.8	46.48	29.70	31.9	36.50	51.64	32.0	12.34	28.3
	7.34	+7.27		16.90	+16.87		57.83	+57.82		7.38	+7.31		18.16	+18.13
	16h 54m	37s.997		17h 59m	40s.30		19h 5m	3s.27		20h 48m	48s.820		23h 27m	44s.653
	+82° 10′	44″.05		+86° 36′	51″.19		+89° 0′	51″.13		+82° 13′	2″.89		+86° 50′	19″.16

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Mar.	16 54	+82 10	Mar.	17 59	+86 36	Mar.	19 3	+89 0	Mar.	20 48	+82 12	Mar.	23 27	+86 50
	s	″		s	″		s	″		s	″		s	″
0.8	35.89	14.43	0.8	25.19	25.03	0.9	43.13	30.29	0.9	36.23	52.56	1.0	12.52	29.35
1.8	36.07	14.38	1.8	25.56	24.88	1.9	44.19	30.07	1.9	36.31	52.23	2.0	12.42	29.00
2.8	36.25	14.36	2.8	25.95	24.76	2.9	45.32	29.87	2.9	36.40	51.92	3.0	12.36	28.66
3.8	36.42	14.36	3.8	26.33	24.68	3.8	46.48	29.70	3.9	36.50	51.64	4.0	12.34	28.32
4.8	36.59	14.39	4.8	26.69	24.62	4.8	47.60	29.56	4.9	36.61	51.38	5.0	12.34	28.00
5.8	36.74	14.43	5.8	27.03	24.58	5.8	48.66	29.44	5.9	36.71	51.15	6.0	12.35	27.70
6.8	36.88	14.47	6.8	27.35	24.54	6.8	49.65	29.33	6.9	36.81	50.94	7.0	12.35	27.43
7.7	37.02	14.49	7.8	27.65	24.50	7.8	50.57	29.21	7.9	36.89	50.73	8.0	12.34	27.17
8.7	37.16	14.50	8.8	27.95	24.43	8.8	51.44	29.07	8.9	36.97	50.50	9.0	12.31	26.91
9.7	37.29	14.49	9.8	28.24	24.34	9.8	52.31	28.92	9.9	37.04	50.26	10.0	12.25	26.64
10.7	37.44	14.46	10.8	28.55	24.24	10.8	53.21	28.75	10.9	37.12	50.01	11.0	12.18	26.36
11.7	37.60	14.44	11.8	28.88	24.13	11.8	54.18	28.56	11.9	37.20	49.73	12.0	12.11	26.04
12.7	37.77	14.44	12.8	29.25	24.04	12.8	55.27	28.38	12.9	37.29	49.44	13.0	12.06	25.71
13.7	37.95	14.45	13.8	29.63	23.96	13.8	56.43	28.21	13.9	37.38	49.16	14.0	12.03	25.37
14.7	38.13	14.48	14.8	30.03	23.90	14.8	57.66	28.06	14.9	37.50	48.89	14.9	12.04	25.01
15.7	38.30	14.55	15.8	30.44	23.87	15.8	58.95	27.93	15.9	37.63	48.63	15.9	12.08	24.65
16.7	38.47	14.64	16.8	30.84	23.86	16.8	60.24	27.83	16.9	37.76	48.39	16.9	12.14	24.30
17.7	38.64	14.75	17.8	31.23	23.88	17.8	61.53	27.75	17.9	37.89	48.17	17.9	12.23	23.97
18.7	38.80	14.86	18.8	31.60	23.91	18.8	62.78	27.68	18.9	38.03	47.97	18.9	12.32	23.66
19.7	38.94	14.98	19.8	31.96	23.94	19.8	63.98	27.62	19.9	38.16	47.79	19.9	12.43	23.36
20.7	39.08	15.10	20.8	32.30	23.97	20.8	65.12	27.58	20.9	38.29	47.62	20.9	12.53	23.07
21.7	39.22	15.20	21.8	32.63	24.00	21.8	66.21	27.53	21.9	38.41	47.45	21.9	12.62	22.78
22.7	39.35	15.30	22.8	32.96	24.02	22.8	67.28	27.48	22.9	38.52	47.29	22.9	12.69	22.50
23.7	39.49	15.39	23.7	33.28	24.04	23.8	68.33	27.41	23.9	38.63	47.11	23.9	12.75	22.24
24.7	39.63	15.46	24.7	33.60	24.04	24.8	69.38	27.33	24.9	38.74	46.92	24.9	12.80	21.96
25.7	39.78	15.53	25.7	33.93	24.03	25.8	70.45	27.24	25.9	38.85	46.72	25.9	12.85	21.67
26.7	39.93	15.61	26.7	34.28	24.02	26.8	71.57	27.15	26.9	38.97	46.52	26.9	12.90	21.36
27.7	40.09	15.71	27.7	34.65	24.03	27.8	72.77	27.06	27.9	39.09	46.30	27.9	12.97	21.04
28.7	40.25	15.82	28.7	35.04	24.05	28.8	74.04	26.99	28.9	39.23	46.10	28.9	13.07	20.71
29.7	40.41	15.96	29.7	35.43	24.10	29.8	75.38	26.94	29.9	39.39	45.91	29.9	13.19	20.38
30.7	40.57	16.13	30.7	35.83	24.17	30.8	76.73	26.92	30.8	39.54	45.75	30.9	13.36	20.06
31.7	40.71	16.32	31.7	36.21	24.28	31.8	78.07	26.93	31.8	39.71	45.61	31.9	13.56	19.75
7.34		+7.27	16.89		+16.86	57.75		+57.74	7.38		+7.31	18.14		+18.12
16^h 54^m		$37^s.997$	17^h 59^m		$40^s.30$	19^h 5^m		$3^s.27$	20^h 48^m		$48^s.820$	23^h 27^m		$44^s.653$
+82° 10′		44″.05	+86° 36′		51″.19	+89° 0′		51″.13	+82° 13′		2″.89	+86° 50′		19″.16

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**89 H. Cephei.** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Decli natio
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Apr.	16 54	+82 10	Apr.	17 59	+86 36	Apr.	19 4	+89 0	Apr.	20 48	+82 12	Apr.	23 27	+86 5
	s	″		s	″		s	″		s	″		s	″
0.7	40.71	16.32	0.7	36.21	24.28	0.8	18.07	26.93	0.8	39.71	45.61	0.9	13.56	19.7
1.7	40.85	16.53	1.7	36.56	24.41	1.8	19.36	26.97	1.8	39.87	45.50	1.9	13.77	19.4
2.7	40.98	16.74	2.7	36.88	24.54	2.8	20.55	27.01	2.8	40.02	45.41	2.9	13.98	19.2
3.7	41.09	16.94	3.7	37.18	24.67	3.8	21.64	27.06	3.8	40.15	45.34	3.9	14.18	18.9
4.7	41.19	17.12	4.7	37.47	24.78	4.8	22.68	27.10	4.8	40.29	45.26	4.9	14.36	18.7
5.7	41.30	17.28	5.7	37.75	24.88	5.8	23.67	27.12	5.8	40.42	45.17	5.9	14.51	18.5
6.7	41.40	17.43	6.7	38.04	24.96	6.8	24.69	27.12	6.8	40.55	45.06	6.9	14.64	18.3
7.7	41.52	17.57	7.7	38.35	25.02	7.8	25.77	27.11	7.8	40.67	44.93	7.9	14.77	18.0
8.7	41.65	17.71	8.7	38.69	25.09	8.8	26.90	27.09	8.8	40.81	44.79	8.9	14.91	17.7
9.7	41.80	17.87	9.7	39.04	25.17	9.7	28.13	27.08	9.8	40.95	44.65	9.9	15.07	17.4
10.7	41.95	18.06	10.7	39.40	25.27	10.7	29.41	27.09	10.8	41.11	44.52	10.9	15.25	17.1
11.7	42.09	18.28	11.7	39.77	25.40	11.7	30.75	27.12	11.8	41.27	44.41	11.9	15.46	16.8
12.6	42.23	18.52	12.7	40.14	25.55	12.7	32.10	27.18	12.8	41.44	44.32	12.9	15.71	16.5
13.6	42.36	18.77	13.7	40.50	25.72	13.7	33.42	27.26	13.8	41.61	44.25	13.9	15.98	16.3
14.6	42.49	19.04	14.7	40.83	25.91	14.7	34.70	27.36	14.8	41.79	44.20	14.9	16.27	16.0
15.6	42.60	19.31	15.7	41.15	26.11	15.7	35.94	27.47	15.8	41.97	44.17	15.9	16.55	15.8
16.6	42.70	19.57	16.7	41.45	26.31	16.7	37.11	27.59	16.8	42.13	44.16	16.9	16.84	15.6
17.6	42.79	19.83	17.7	41.73	26.50	17.7	38.21	27.71	17.8	42.29	44.14	17.9	17.12	15.3
18.6	42.88	20.08	18.7	41.99	26.69	18.7	39.27	27.82	18.8	42.44	44.14	18.9	17.38	15.2
19.6	42.97	20.31	19.7	42.25	26.87	19.7	40.28	27.92	19.8	42.59	44.12	19.9	17.63	15.0
20.6	43.06	20.53	20.7	42.51	27.03	20.7	41.28	28.01	20.8	42.73	44.10	20.9	17.87	14.8
21.6	43.16	20.74	21.7	42.77	27.19	21.7	42.28	28.09	21.8	42.87	44.06	21.9	18.09	14.61
22.6	43.26	20.96	22.7	43.05	27.34	22.7	43.32	28.16	22.8	43.01	44.02	22.9	18.31	14.4
23.6	43.36	21.18	23.7	43.34	27.49	23.7	44.42	28.23	23.8	43.16	43.97	23.9	18.54	14.1
24.6	43.47	21.41	24.7	43.64	27.65	24.7	45.57	28.32	24.8	43.32	43.93	24.9	18.79	13.9
25.6	43.58	21.67	25.7	43.95	27.84	25.7	46.77	28.43	25.8	43.49	43.90	25.9	19.07	13.71
26.6	43.69	21.96	26.7	44.26	28.06	26.7	48.00	28.56	26.8	43.67	43.89	26.9	19.39	13.4
27.6	43.78	22.27	27.7	44.56	28.31	27.7	49.22	28.72	27.8	43.85	43.91	27.9	19.74	13.2
28.6	43.86	22.59	28.7	44.83	28.57	28.7	50.37	28.91	28.8	44.03	43.96	28.9	20.10	13.0
29.6	43.93	22.92	29.6	45.07	28.84	29.7	51.44	29.11	29.8	44.20	44.03	29.9	20.47	12.93
30.6	43.99	23.24	30.6	45.29	29.12	30.7	52.41	29.32	30.8	44.36	44.13	30.9	20.84	12.8
31.6	44.03	23.55	31.6	45.48	29.39	31.7	53.28	29.53	31.8	44.52	44.22	31.9	21.18	12.68
7.34		+7.27	16.90		+16.87	57.74		+57.73	7.38		+7.31	18.13		+18.10
$16^h\ 54^m$		$37^s.997$	$17^h\ 59^m$		$40^s.30$	$19^h\ 5^m$		$3^s.27$	$20^h\ 48^m$		$48^s.820$	$23^h\ 27^m$		$44^s.653$
+82° 10′		44″.05	+86° 36′		51″.19	+89° 0′		51″.13	+82° 13′		2″.89	+86° 50′		19″.16

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Ursæ Minoris. Mag. 4.4			δ Ursæ Minoris. Mag. 4.4			λ Ursæ Minoris. Mag. 6.6			76 Draconis. Mag. 5.7			39 H. Cephei. Mag. 5.6		
m ar te.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
y	16 54	+82 10	May	17 59	+86 36	May	19 4	+89 0	May	20 48	+82 12	May	23 27	+86 50
	s	″		s	″		s	″		s	″		s	″
.6	43.99	23.24	0.6	45.29	29.12	0.7	52.41	29.32	0.8	44.36	44.13	0.9	20.84	12.80
.6	44.03	23.55	1.6	45.48	29.39	1.7	53.28	29.53	1.8	44.52	44.22	1.9	21.18	12.68
.6	44.08	23.83	2.6	45.66	29.63	2.7	54.09	29.72	2.8	44.66	44.31	2.9	21.49	12.58
.6	44.13	24.09	3.6	45.83	29.85	3.7	54.89	29.89	3.8	44.80	44.38	3.9	21.78	12.47
.6	44.19	24.34	4.6	46.02	30.05	4.7	55.71	30.03	4.8	44.93	44.43	4.9	22.05	12.34
.6	44.26	24.59	5.6	46.23	30.25	5.7	56.57	30.17	5.7	45.07	44.47	5.9	22.33	12.19
.6	44.33	24.84	6.6	46.46	30.46	6.7	57.52	30.31	6.7	45.22	44.51	6.9	22.61	12.03
.6	44.41	25.11	7.6	46.70	30.68	7.7	58.55	30.46	7.7	45.38	44.54	7.9	22.92	11.86
.6	44.49	25.41	8.6	46.96	30.92	8.7	59.61	30.63	8.7	45.55	44.59	8.9	23.25	11.68
.6	44.56	25.74	9.6	47.21	31.19	9.7	60.70	30.82	9.7	45.72	44.65	9.8	23.62	11.52
.6	44.63	26.08	10.6	47.44	31.48	10.7	61.77	31.04	10.7	45.89	44.74	10.8	24.01	11.37
.6	44.69	26.43	11.6	47.66	31.79	11.7	62.78	31.28	11.7	46.07	44.85	11.8	24.42	11.24
.6	44.73	26.79	12.6	47.86	32.11	12.7	63.74	31.54	12.7	46.25	44.99	12.8	24.83	11.13
.6	44.76	27.14	13.6	48.03	32.43	13.7	64.62	31.80	13.7	46.41	45.14	13.8	25.24	11.04
.6	44.79	27.48	14.6	48.19	32.74	14.7	65.42	32.05	14.7	46.56	45.29	14.8	25.63	10.96
.6	44.81	27.81	15.6	48.32	33.04	15.6	66.17	32.31	15.7	46.71	45.46	15.8	26.00	10.89
.6	44.83	28.13	16.6	48.44	33.33	16.6	66.86	32.55	16.7	46.85	45.61	16.8	26.37	10.84
7.6	44.85	28.43	17.6	48.56	33.61	17.6	67.53	32.78	17.7	46.98	45.76	17.8	26.71	10.79
8.6	44.87	28.71	18.6	48.68	33.87	18.6	68.17	33.00	18.7	47.11	45.90	18.8	27.04	10.74
9.5	44.90	28.99	19.6	48.81	34.12	19.6	68.84	33.21	19.7	47.25	46.02	19.8	27.35	10.67
0.5	44.94	29.27	20.6	48.95	34.37	20.6	69.55	33.42	20.7	47.38	46.13	20.8	27.68	10.60
1.5	44.97	29.56	21.6	49.11	34.63	21.6	70.31	33.63	21.7	47.52	46.25	21.8	28.02	10.51
2.5	45.01	29.87	22.6	49.28	34.90	22.6	71.11	33.85	22.7	47.67	46.38	22.8	28.38	10.42
3.5	45.05	30.20	23.6	49.44	35.20	23.6	71.96	34.09	23.7	47.83	46.52	23.8	28.77	10.33
4.5	45.08	30.55	24.6	49.60	35.53	24.6	72.79	34.36	24.7	47.99	46.69	24.8	29.18	10.26
5.5	45.10	30.93	25.6	49.73	35.88	25.6	73.56	34.66	25.7	48.15	46.88	25.8	29.62	10.22
6.5	45.09	31.31	26.6	49.83	36.24	26.6	74.25	34.98	26.7	48.31	47.11	26.8	30.07	10.21
7.5	45.08	31.68	27.6	49.90	36.60	27.6	74.83	35.32	27.7	48.46	47.35	27.8	30.52	10.22
8.5	45.05	32.03	28.6	49.94	36.95	28.6	75.29	35.64	28.7	48.59	47.61	28.8	30.94	10.25
9.5	45.02	32.35	29.6	49.96	37.27	29.6	75.68	35.95	29.7	48.71	47.86	29.8	31.33	10.29
30.5	45.00	32.65	30.6	49.97	37.58	30.6	76.02	36.24	30.7	48.82	48.09	30.8	31.70	10.34
31.5	44.97	32.94	31.6	49.99	37.87	31.6	76.35	36.50	31.7	48.92	48.30	31.8	32.03	10.38
	7.34	+7.28		16.91	+16.88		57.82	+57.81		7.38	+7.31		18.12	+18.09
	16^h 54^m	$37^s.997$		17^h 59^m	$40^s.30$		19^h 5^m	$3^s.27$		20^h 48^m	$48^s.820$		23^h 27^m	$44^s.653$
	82° 10′	44″.05		+86° 36′	51″.19		+89° 0′	51″.13		+82° 13′	2″.89		+86° 50′	10″ [illegible]

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**30 H. Cephei.** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Decli
	h m	° '		h m	° '		h m	° '		h m	° '		h m	°
June	16 54	+82 10	June	17 59	+86 36	June	19 5	+89 0	June	20 48	+82 12	June	23 27	+86
	s	''		s	''		s	''		s	''		s	''
0.5	44.97	32.94	0.6	49.99	37.87	0.6	16.35	36.50	0.7	48.92	48.30	0.8	32.03	10.
1.5	44.96	33.22	1.6	50.02	38.14	1.6	16.72	36.75	1.7	49.02	48.50	1.8	32.36	10.
2.5	44.96	33.49	2.6	50.08	38.41	2.6	17.18	36.99	2.7	49.14	48.68	2.8	32.69	10.
3.5	44.95	33.77	3.6	50.15	38.69	3.6	17.70	37.24	3.7	49.27	48.86	3.8	33.04	10.
4.5	44.95	34.08	4.5	50.24	38.98	4.6	18.26	37.50	4.7	49.39	49.05	4.8	33.41	10.
5.5	44.95	34.42	5.5	50.33	39.30	5.6	18.86	37.78	5.7	49.53	49.26	5.8	33.81	10.
6.5	44.94	34.77	6.5	50.40	39.64	6.6	19.45	38.08	6.7	49.67	49.49	6.8	34.24	10.
7.5	44.92	35.13	7.5	50.45	39.99	7.6	19.99	38.41	7.7	49.81	49.74	7.8	34.68	10.
8.5	44.90	35.49	8.5	50.49	40.36	8.6	20.47	38.75	8.7	49.95	50.01	8.8	35.11	10.
9.5	44.86	35.85	9.5	50.51	40.73	9.6	20.87	39.10	9.7	50.08	50.29	9.8	35.56	10.
10.5	44.81	36.20	10.5	50.50	41.09	10.6	21.20	39.45	10.7	50.20	50.58	10.8	35.99	10.
11.5	44.76	36.54	11.5	50.47	41.44	11.6	21.44	39.79	11.6	50.31	50.87	11.8	36.40	10.
12.5	44.71	36.86	12.5	50.43	41.77	12.6	21.63	40.11	12.6	50.41	51.17	12.8	36.79	10.
13.5	44.65	37.16	13.5	50.37	42.09	13.6	21.78	40.43	13.6	50.51	51.45	13.8	37.16	10.
14.5	44.59	37.44	14.5	50.32	42.40	14.6	21.89	40.74	14.6	50.60	51.72	14.7	37.52	10.
15.5	44.54	37.71	15.5	50.27	42.69	15.6	22.01	41.03	15.6	50.68	51.98	15.7	37.86	11.
16.5	44.50	37.97	16.5	50.24	42.97	16.6	22.16	41.30	16.6	50.77	52.23	16.7	38.19	11.
17.5	44.46	38.24	17.5	50.21	43.25	17.6	22.35	41.58	17.6	50.86	52.48	17.7	38.52	11.
18.5	44.42	38.53	18.5	50.20	43.54	18.6	22.60	41.86	18.6	50.96	52.72	18.7	38.87	11.
19.5	44.38	38.83	19.5	50.19	43.86	19.6	22.88	42.16	19.6	51.08	52.97	19.7	39.25	11.
20.5	44.34	39.15	20.5	50.18	44.20	20.6	23.17	42.48	20.6	51.19	53.25	20.7	39.66	11.
21.5	44.29	39.49	21.5	50.15	44.56	21.5	23.42	42.84	21.6	51.30	53.55	21.7	40.09	11.
22.5	44.22	39.84	22.5	50.09	44.93	22.5	23.60	43.21	22.6	51.41	53.89	22.7	40.53	11.
23.5	44.14	40.18	23.5	49.99	45.30	23.5	23.67	43.59	23.6	51.51	54.24	23.7	40.97	11.
24.4	44.05	40.51	24.5	49.87	45.67	24.5	23.62	43.97	24.6	51.59	54.60	24.7	41.39	12.
25.4	43.94	40.82	25.5	49.72	46.02	25.5	23.46	44.34	25.6	51.66	54.96	25.7	41.77	12.
26.4	43.83	41.10	26.5	49.56	46.34	26.5	23.23	44.69	26.6	51.72	55.32	26.7	42.12	12.
27.4	43.73	41.35	27.5	49.40	46.64	27.5	22.98	45.01	27.6	51.77	55.65	27.7	42.45	12.6
28.4	43.64	41.58	28.5	49.25	46.91	28.5	22.76	45.30	28.6	51.82	55.96	28.7	42.76	12.
29.4	43.57	41.81	29.5	49.12	47.18	29.5	22.60	45.59	29.6	51.87	56.25	29.7	43.06	12.
30.4	43.49	42.05	30.5	49.00	47.46	30.5	22.51	45.88	30.6	51.93	56.53	30.7	43.37	13.
31.4	43.42	42.30	31.5	48.90	47.74	31.5	22.47	46.18	31.6	52.00	56.82	31.7	43.69	13.
	7.35	+7.28		16.92	+16.89		57.96	+57.95		7.38	+7.31		18.12	+18.09
	$16^h\ 54^m$	$37^s.997$		$17^h\ 59^m$	$40^s.30$		$19^h\ 5^m$	$3^s.27$		$20^h\ 48^m$	$48^s.820$		$23^h\ 27^m$	$44^s.65$
	+82° 10'	44''.05		+86° 36'	51''.19		+89° 0'	51''.13		+82° 13'	2''.89		+86° 50'	19''.16

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Ursæ Minoris. Mag. 4.4			δ Ursæ Minoris. Mag. 4.4			λ Ursæ Minoris. Mag. 6.6			76 Draconis. Mag. 5.7			39 H. Cephei. Mag. 5.6		
an lar te.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
ly	16 54	+82 10	July	17 59	+86 36	July	19 5	+89 0	July	20 48	+82 12	July	23 27	+86 50
	s	''		s	''		s	''		s	''		s	''
0.4	43.49	42.05	0.5	49.00	47.46	0.5	22.51	45.88	0.6	51.93	56.53	0.7	43.37	13.10
1.4	43.42	42.30	1.5	48.90	47.74	1.5	22.47	46.18	1.6	52.00	56.82	1.7	43.69	13.24
2.4	43.35	42.57	2.5	48.81	48.04	2.5	22.47	46.49	2.6	52.08	57.11	2.7	44.05	13.38
3.4	43.28	42.86	3.5	48.72	48.36	3.5	22.48	46.82	3.6	52.16	57.42	3.7	44.43	13.53
4.4	43.19	43.16	4.5	48.61	48.70	4.5	22.46	47.17	4.6	52.25	57.75	4.7	44.82	13.69
5.4	43.10	43.47	5.5	48.49	49.05	5.5	22.38	47.54	5.6	52.33	58.10	5.7	45.22	13.87
6.4	43.00	43.78	6.5	48.34	49.40	6.5	22.22	47.91	6.6	52.39	58.47	6.7	45.62	14.07
7.4	42.89	44.08	7.5	48.16	49.74	7.5	21.98	48.28	7.6	52.45	58.84	7.7	46.00	14.29
8.4	42.76	44.35	8.5	47.97	50.07	8.5	21.66	48.64	8.6	52.50	59.22	8.7	46.37	14.52
9.4	42.64	44.61	9.5	47.76	50.38	9.5	21.28	48.99	9.6	52.55	59.60	9.7	46.71	14.77
0.4	42.51	44.85	10.5	47.54	50.68	10.5	20.85	49.34	10.6	52.58	59.97	10.7	47.03	15.02
1.4	42.39	45.06	11.4	47.31	50.97	11.5	20.38	49.66	11.6	52.60	60.32	11.7	47.33	15.28
2.4	42.27	45.27	12.4	47.10	51.23	12.5	19.91	49.97	12.6	52.62	60.66	12.7	47.61	15.52
3.4	42.15	45.46	13.4	46.89	51.48	13.5	19.45	50.26	13.6	52.64	60.98	13.7	47.88	15.75
4.4	42.04	45.65	14.4	46.69	51.73	14.5	19.04	50.54	14.6	52.67	61.30	14.7	48.15	15.97
5.4	41.94	45.85	15.4	46.51	51.98	15.5	18.68	50.83	15.6	52.70	61.61	15.7	48.42	16.18
16.4	41.84	46.07	16.4	46.33	52.25	16.5	18.37	51.13	16.6	52.74	61.92	16.7	48.72	16.39
17.4	41.74	46.31	17.4	46.15	52.53	17.5	18.06	51.45	17.5	52.79	62.25	17.7	49.04	16.60
18.4	41.62	46.55	18.4	45.96	52.83	18.5	17.76	51.78	18.5	52.83	62.61	18.7	49.38	16.82
19.4	41.50	46.82	19.4	45.76	53.15	19.5	17.40	52.13	19.5	52.87	62.99	19.7	49.74	17.07
20.4	41.36	47.08	20.4	45.53	53.49	20.5	16.94	52.50	20.5	52.91	63.39	20.7	50.10	17.34
21.4	41.22	47.33	21.4	45.26	53.81	21.5	16.37	52.88	21.5	52.94	63.80	21.6	50.44	17.64
22.4	41.06	47.55	22.4	44.96	54.11	22.5	15.67	53.24	22.5	52.94	64.22	22.6	50.76	17.96
23.4	40.90	47.75	23.4	44.64	54.39	23.5	14.90	53.59	23.5	52.93	64.63	23.6	51.04	18.30
24.4	40.73	47.92	24.4	44.32	54.64	24.5	14.09	53.91	24.5	52.92	65.02	24.6	51.28	18.62
25.4	40.58	48.06	25.4	44.01	54.86	25.5	13.28	54.20	25.5	52.89	65.38	25.6	51.49	18.94
26.4	40.44	48.20	26.4	43.71	55.07	26.5	12.51	54.47	26.5	52.88	65.72	26.6	51.70	19.23
27.4	40.31	48.33	27.4	43.44	55.28	27.5	11.81	54.73	27.5	52.87	66.05	27.6	51.90	19.51
28.4	40.18	48.48	28.4	43.19	55.49	28.4	11.20	54.99	28.5	52.85	66.37	28.6	52.12	19.77
29.4	40.05	48.64	29.4	42.95	55.72	29.4	10.62	55.27	29.5	52.86	66.70	29.6	52.37	20.03
30.4	39.92	48.82	30.4	42.71	55.96	30.4	10.05	55.57	30.5	52.87	67.03	30.6	52.63	20.29
31.3	39.79	49.01	31.4	42.46	56.23	31.4	9.49	55.88	31.5	52.88	67.39	31.6	52.92	20.56
	7.35	+7.28		16.93	+16.90		58.12	+58.11		7.38	+7.32		18.13	+18.10
	$16^h\ 54^m$	$37^s.997$		$17^h\ 59^m$	$40^s.30$		$19^h\ 5^m$	$3^s.27$		$20^h\ 48^m$	$48^s.820$		$23^h\ 27^m$	$44^s.653$
	+82° 10′	$44''.05$		+86° 36′	$51''.19$		+89° 0′	$51''.13$		+82° 13′	$2''.89$		+86° 50′	$19''.16$

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Aug.	16 54	+82 10	Aug.	17 59	+86 36	Aug.	19 4	+89 0	Aug.	20 48	+82 13	Aug.	23 27	+86 [illegible]
	s	″		s	″		s	″		s	″		s	″
0.3	39.79	49.01	0.4	42.46	56.23	0.4	69.49	55.88	0.5	52.88	7.39	0.6	52.92	[illegible]
1.3	39.65	49.22	1.4	42.19	56.50	1.4	68.87	56.21	1.5	52.89	7.78	1.6	53.22	[illegible]
2.3	39.50	49.42	2.4	41.90	56.78	2.4	68.19	56.55	2.5	52.89	8.18	2.6	53.51	[illegible]
3.3	39.33	49.61	3.4	41.59	57.05	3.4	67.42	56.89	3.5	52.88	8.58	3.6	53.79	[illegible]
4.3	39.17	49.79	4.4	41.27	57.32	4.4	66.59	57.22	4.5	52.87	8.98	4.6	54.05	[illegible]
5.3	38.99	49.94	5.4	40.92	57.57	5.4	65.69	57.54	5.5	52.84	9.38	5.6	54.29	[illegible]
6.3	38.82	50.08	6.4	40.56	57.79	6.4	64.73	57.85	6.5	52.80	9.77	6.6	54.51	[illegible]
7.3	38.65	50.19	7.4	40.20	58.00	7.4	63.74	58.13	7.5	52.76	10.15	7.6	54.70	[illegible]
8.3	38.48	50.29	8.4	39.84	58.18	8.4	62.74	58.40	8.5	52.71	10.51	8.6	54.87	[illegible]
9.3	38.31	50.37	9.4	39.50	58.35	9.4	61.75	58.65	9.5	52.66	10.86	9.6	55.02	[illegible]
10.3	38.16	50.44	10.4	39.16	58.51	10.4	60.79	58.89	10.5	52.61	11.19	10.6	55.16	[illegible]
11.3	38.01	50.53	11.4	38.84	58.67	11.4	59.87	59.12	11.5	52.56	11.52	11.6	55.31	[illegible]
12.3	37.86	50.62	12.4	38.52	58.84	12.4	59.02	59.37	12.5	52.52	11.84	12.6	55.47	[illegible]
13.3	37.71	50.72	13.4	38.22	59.03	13.4	58.20	59.62	13.5	52.50	12.16	13.6	55.66	[illegible]
14.3	37.56	50.85	14.4	37.91	59.23	14.4	57.39	59.89	14.5	52.47	12.51	14.6	55.87	[illegible]
15.3	37.40	50.98	15.4	37.58	59.45	15.4	56.54	60.18	15.5	52.44	12.88	15.6	56.09	[illegible]
16.3	37.23	51.12	16.3	37.23	59.68	16.4	55.62	60.49	16.5	52.41	13.27	16.6	56.31	[illegible]
17.3	37.05	51.26	17.3	36.86	59.92	17.4	54.60	60.81	17.5	52.38	13.68	17.6	56.53	[illegible]
18.3	36.86	51.37	18.3	36.46	60.15	18.4	53.47	61.12	18.5	52.32	14.09	18.6	56.73	[illegible]
19.3	36.66	51.46	19.3	36.03	60.34	19.4	52.25	61.41	19.5	52.24	14.50	19.6	56.89	27.03
20.3	36.47	51.51	20.3	35.60	60.50	20.4	50.96	61.67	20.5	52.16	14.89	20.6	57.02	27.44
21.3	36.28	51.53	21.3	35.17	60.63	21.4	49.67	61.90	21.5	52.08	15.25	21.6	57.11	27.84
22.3	36.10	51.53	22.3	34.76	60.74	22.4	48.41	62.11	22.5	51.98	15.58	22.6	57.18	[illegible]
23.3	35.92	51.54	23.3	34.37	60.84	23.4	47.22	62.30	23.4	51.89	15.89	23.6	57.24	28.59
24.3	35.76	51.55	24.3	34.00	60.95	24.4	46.10	62.49	24.4	51.81	16.19	24.6	57.32	28.93
25.3	35.61	51.58	25.3	33.65	61.07	25.4	45.05	62.70	25.4	51.75	16.50	25.6	57.42	29.26
26.3	35.45	51.63	26.3	33.31	61.21	26.4	44.05	62.92	26.4	51.69	16.81	26.6	57.54	29.59
27.3	35.29	51.68	27.3	32.96	61.36	27.4	43.04	63.15	27.4	51.62	17.13	27.5	57.67	29.92
28.3	35.12	51.75	28.3	32.60	61.52	28.4	41.99	63.39	28.4	51.56	17.47	28.5	57.82	30.27
29.3	34.95	51.83	29.3	32.22	61.69	29.4	40.90	63.64	29.4	51.51	17.83	29.5	57.97	30.65
30.3	34.76	51.89	30.3	31.83	61.85	30.4	39.74	63.90	30.4	51.43	18.21	30.5	58.10	31.05
31.3	34.57	51.93	31.3	31.41	62.01	31.4	38.50	64.15	31.4	51.35	18.57	31.5	58.23	31.43
	7.35	+7.28		16.94	+16.91		58.27	+58.26		7.39	+7.32		18.14	+18.12
	$16^h\ 54^m$	$37^s.997$		$17^h\ 59^m$	$40^s.30$		$19^h\ 5^m$	$3^s.27$		$20^h\ 48^m$	$48^s.820$		$23^h\ 27^m$	$44^s.653$
	+82° 10′	44″.05		+86° 36′	51″.19		+89° 0′	51″.13		+82° 13′	2″.89		+86° 50′	19″.16

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

rsæ Minoris. Mag. 4.4			δ Ursæ Minoris. Mag. 4.4			λ Ursæ Minoris. Mag. 6.6			76 Draconis. Mag. 5.7			39 H. Cephei. Mag. 5.6		
e.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
t.	16 54	+82 10	Sept.	17 59	+86 37	Sept.	19 3	+89 1	Sept.	20 48	+82 13	Sept.	23 27	+86 50
	s	″		s	″		s	″		s	″		s	″
3	34.57	51.93	0.3	31.41	2.01	0.4	98.50	4.15	0.4	51.35	18.57	0.5	58.23	31.43
3	34.38	51.96	1.3	30.98	2.14	1.4	97.19	4.39	1.4	51.26	18.93	1.5	58.33	31.84
3	34.18	51.97	2.3	30.54	2.26	2.3	95.84	4.61	2.4	51.16	19.29	2.5	58.41	32.26
.3	33.99	51.96	3.3	30.09	2.36	3.3	94.46	4.81	3.4	51.05	19.64	3.5	58.45	32.66
.3	33.80	51.92	4.3	29.64	2.44	4.3	93.05	4.99	4.4	50.94	19.97	4.5	58.48	33.06
.2	33.61	51.87	5.3	29.20	2.49	5.3	91.66	5.16	5.4	50.82	20.27	5.5	58.49	33.45
.2	33.43	51.82	6.3	28.78	2.54	6.3	90.31	5.31	6.4	50.70	20.56	6.5	58.48	33.83
.2	33.26	51.76	7.3	28.37	2.58	7.3	88.98	5.45	7.4	50.59	20.84	7.5	58.47	34.20
.2	33.10	51.71	8.3	27.98	2.63	8.3	87.72	5.59	8.4	50.49	21.12	8.5	58.48	34.55
.2	32.94	51.68	9.3	27.61	2.69	9.3	86.52	5.74	9.4	50.39	21.39	9.5	58.50	34.90
.2	32.77	51.65	10.3	27.23	2.77	10.3	85.34	5.91	10.4	50.30	21.68	10.5	58.54	35.25
.2	32.60	51.65	11.3	26.85	2.86	11.3	84.15	6.10	11.4	50.21	21.99	11.5	58.61	35.61
.2	32.42	51.66	12.3	26.45	2.97	12.3	82.91	6.30	12.4	50.12	22.31	12.5	58.69	35.99
.2	32.23	51.66	13.3	26.01	3.08	13.3	81.59	6.52	13.4	50.02	22.65	13.5	58.76	36.40
.2	32.03	51.64	14.3	25.55	3.18	14.3	80.16	6.73	14.4	49.91	23.01	14.5	58.81	36.83
.2	31.83	51.59	15.3	25.07	3.26	15.3	78.64	6.93	15.4	49.79	23.35	15.5	58.82	37.27
.2	31.62	51.52	16.3	24.58	3.31	16.3	77.05	7.10	16.4	49.65	23.67	16.5	58.80	37.71
.2	31.41	51.42	17.3	24.10	3.32	17.3	75.44	7.23	17.4	49.50	23.98	17.5	58.75	38.15
.2	31.22	51.30	18.3	23.63	3.31	18.3	73.85	7.34	18.4	49.35	24.26	18.5	58.67	38.56
.2	31.04	51.17	19.3	23.19	3.29	19.3	72.34	7.42	19.4	49.20	24.51	19.5	58.58	38.95
0.2	30.88	51.04	20.3	22.77	3.27	20.3	70.90	7.50	20.4	49.06	24.74	20.5	58.49	39.32
1.2	30.71	50.92	21.3	22.36	3.26	21.3	69.55	7.59	21.4	48.93	24.97	21.5	58.42	39.67
2.2	30.55	50.82	22.2	21.97	3.25	22.3	68.25	7.68	22.4	48.82	25.20	22.5	58.37	40.00
3.2	30.39	50.74	23.2	21.58	3.27	23.3	66.97	7.80	23.4	48.71	25.44	23.5	58.34	40.35
4.2	30.23	50.67	24.2	21.18	3.29	24.3	65.68	7.93	24.4	48.60	25.70	24.5	58.34	40.71
5.2	30.06	50.60	25.2	20.77	3.33	25.3	64.35	8.06	25.4	48.48	25.97	25.5	58.33	41.09
6.2	29.88	50.53	26.2	20.35	3.36	26.3	62.97	8.19	26.4	48.35	26.25	26.5	58.31	41.47
7.2	29.70	50.45	27.2	19.91	3.39	27.3	61.51	8.33	27.4	48.22	26.54	27.5	58.28	41.86
28.2	29.51	50.35	28.2	19.44	3.40	28.3	59.99	8.46	28.3	48.08	26.82	28.5	58.23	42.27
29.2	29.32	50.23	29.2	18.97	3.40	29.3	58.43	8.57	29.3	47.94	27.09	29.5	58.16	42.69
30.2	29.13	50.08	30.2	18.51	3.37	30.3	56.83	8.67	30.3	47.79	27.35	30.5	58.07	43.10
31.2	28.95	49.92	31.2	18.05	3.32	31.3	55.22	8.74	31.3	47.62	27.60	31.5	57.93	43.50
	7.35	+7.28		16.95	+16.92		58.38	+58.38		7.39	+7.32		18.16	+18.14
	$16^{h}\ 54^{m}$	$37^{s}.997$		$17^{h}\ 59^{m}$	$40^{s}.30$		$19^{h}\ 5^{m}$	$3^{s}.27$		$20^{h}\ 48^{m}$	$48^{s}.820$		$23^{h}\ 27^{m}$	$44^{s}.653$
	+82° 10′	44″.05		+86° 36′	51″.19		+89° 0′	51″.13		+82° 13′	2″.89		+86° 50′	19″.16

[Eph 15]

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4

Mean Solar Date.	Right Ascension.	Declination North.
	h m	° ′
Oct.	16 54	+82 10
	s	″
0.2	29.13	50.08
1.2	28.95	49.92
2.2	28.78	49.75
3.2	28.60	49.55
4.2	28.44	49.35
5.2	28.29	49.16
6.2	28.14	48.98
7.2	28.00	48.82
8.2	27.84	48.68
9.2	27.69	48.54
10.2	27.53	48.41
11.2	27.35	48.27
12.1	27.17	48.10
13.1	26.98	47.90
14.1	26.80	47.68
15.1	26.62	47.44
16.1	26.47	47.18
17.1	26.33	46.91
18.1	26.19	46.66
19.1	26.07	46.42
20.1	25.94	46.21
21.1	25.80	46.01
22.1	25.67	45.82
23.1	25.54	45.63
24.1	25.39	45.43
25.1	25.24	45.21
26.1	25.08	44.97
27.1	24.93	44.72
28.1	24.79	44.44
29.1	24.65	44.15
30.1	24.52	43.84
31.1	24.39	43.53

7.35 +7.28
16h 54m 37s.997
+82° 10′ 44″.05

δ Ursæ Minoris. Mag. 4.4

Mean Solar Date.	Right Ascension.	Declination North.
	h m	° ′
Oct.	17 59	+86 36
	s	″
0.2	18.51	63.37
1.2	18.05	63.32
2.2	17.59	63.25
3.2	17.14	63.17
4.2	16.72	63.08
5.2	16.31	62.99
6.2	15.92	62.90
7.2	15.54	62.84
8.2	15.15	62.79
9.2	14.74	62.75
10.2	14.32	62.73
11.2	13.88	62.70
12.2	13.42	62.65
13.2	12.94	62.58
14.2	12.46	62.48
15.2	12.00	62.35
16.2	11.56	62.19
17.2	11.15	62.02
18.2	10.77	61.86
19.2	10.40	61.72
20.2	10.04	61.59
21.2	9.69	61.48
22.2	9.32	61.38
23.2	8.94	61.28
24.2	8.54	61.17
25.2	8.13	61.06
26.2	7.71	60.93
27.2	7.29	60.77
28.1	6.88	60.60
29.1	6.47	60.41
30.1	6.08	60.20
31.1	5.71	59.98

16.95 +16.92
17h 59m 40s.30
+86° 36′ 51″.19

λ Ursæ Minoris. Mag. 6.6

Mean Solar Date.	Right Ascension.	Declination North.
	h m	° ′
Oct.	19 3	+89 1
	s	″
0.3	56.83	8.67
1.3	55.22	8.74
2.3	53.62	8.79
3.3	52.05	8.82
4.3	50.52	8.83
5.3	49.06	8.85
6.3	47.66	8.87
7.3	46.31	8.90
8.2	44.97	8.95
9.2	43.59	9.02
10.2	42.17	9.11
11.2	40.65	9.19
12.2	39.03	9.26
13.2	37.34	9.31
14.2	35.63	9.32
15.2	33.93	9.31
16.2	32.29	9.27
17.2	30.74	9.22
18.2	29.29	9.16
19.2	27.91	9.11
20.2	26.58	9.08
21.2	25.26	9.07
22.2	23.92	9.07
23.2	22.53	9.07
24.2	21.09	9.07
25.2	19.58	9.07
26.2	18.04	9.05
27.2	16.47	9.01
28.2	14.88	8.95
29.2	13.31	8.87
30.2	11.77	8.77
31.2	10.28	8.65

58.42 +58.42
19h 5m 3s.27
+89° 0′ 51″.13

76 Draconis. Mag. 5.7

Mean Solar Date.	Right Ascension.	Declination North.
	h m	° ′
Oct.	20 48	+82 13
	s	″
0.3	47.79	27.35
1.3	47.62	27.60
2.3	47.45	27.82
3.3	47.29	28.02
4.3	47.13	28.20
5.3	46.97	28.38
6.3	46.82	28.55
7.3	46.68	28.73
8.3	46.55	28.93
9.3	46.41	29.14
10.3	46.27	29.37
11.3	46.12	29.61
12.3	45.96	29.85
13.3	45.78	30.08
14.3	45.60	30.29
15.3	45.41	30.46
16.3	45.23	30.60
17.3	45.05	30.72
18.3	44.88	30.83
19.3	44.72	30.94
20.3	44.57	31.06
21.3	44.42	31.19
22.3	44.28	31.33
23.3	44.13	31.49
24.3	43.97	31.65
25.3	43.80	31.81
26.3	43.63	31.95
27.3	43.45	32.08
28.3	43.27	32.19
29.3	43.08	32.29
30.3	42.89	32.37
31.3	42.71	32.42

7.39 +7.32
20h 48m 48s.820
+82° 13′ 2″.89

39 H. Cephei. Mag. 5.6

Mean Solar Date.	Right Ascension.	[illegible]
	h m	[illegible]
Oct.	23 27	[illegible]
	s	[illegible]
0.5	58.07	[illegible]
1.5	57.93	[illegible]
2.4	57.79	[illegible]
3.4	57.63	[illegible]
4.4	57.47	[illegible]
5.4	57.31	[illegible]
6.4	57.16	[illegible]
7.4	57.03	[illegible]
8.4	56.93	[illegible]
9.4	56.85	[illegible]
10.4	56.77	[illegible]
11.4	56.67	[illegible]
12.4	56.55	[illegible]
13.4	56.39	[illegible]
14.4	56.19	[illegible]
15.4	55.96	[illegible]
16.4	55.72	[illegible]
17.4	55.47	[illegible]
18.4	55.24	[illegible]
19.4	55.02	[illegible]
20.4	54.83	[illegible]
21.4	54.66	[illegible]
22.4	54.50	[illegible]
23.4	54.33	[illegible]
24.4	54.16	[illegible]
25.4	53.98	[illegible]
26.4	53.76	[illegible]
27.4	53.52	[illegible]
28.4	53.26	[illegible]
29.4	52.97	[illegible]
30.4	52.67	[illegible]
31.4	52.37	[illegible]

18.18 +18.15
23h 27m 44s.65
+86° 50′ 19″.16

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

rsæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
n r e.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
v.	16 54	+82 10	Nov.	17 58	+86 36	Nov.	19 2	+89 1	Nov.	20 48	+82 13	Nov.	23 27	+86 50
	s	″		s	″		s	″		s	″		s	″
.1	24.39	43.53	0.1	65.71	59.98	0.2	70.28	8.65	0.3	42.71	32.42	0.4	52.37	53.97
.1	24.28	43.22	1.1	65.35	59.76	1.2	68.86	8.53	1.3	42.52	32.46	1.4	52.07	54.25
.1	24.17	42.92	2.1	65.02	59.55	2.2	67.51	8.41	2.3	42.35	32.50	2.4	51.78	54.51
.1	24.07	42.64	3.1	64.70	59.34	3.2	66.22	8.30	3.3	42.18	32.53	3.4	51.50	54.76
.1	23.97	42.38	4.1	64.39	59.15	4.2	64.96	8.20	4.2	42.02	32.57	4.4	51.25	55.01
.1	23.86	42.13	5.1	64.06	58.98	5.2	63.70	8.12	5.2	41.87	32.64	5.4	51.01	55.27
.1	23.75	41.89	6.1	63.72	58.83	6.2	62.40	8.06	6.2	41.72	32.73	6.4	50.79	55.55
.1	23.63	41.64	7.1	63.37	58.67	7.2	61.02	8.00	7.2	41.56	32.82	7.4	50.56	55.85
.1	23.50	41.38	8.1	63.00	58.50	8.2	59.56	7.94	8.2	41.40	32.92	8.3	50.32	56.17
.1	23.37	41.09	9.1	62.60	58.31	9.2	58.04	7.86	9.2	41.22	33.01	9.3	50.04	56.49
.1	23.23	40.78	10.1	62.20	58.09	10.2	56.47	7.75	10.2	41.03	33.08	10.3	49.72	56.81
.1	23.11	40.43	11.1	61.81	57.84	11.2	54.91	7.61	11.2	40.82	33.12	11.3	49.37	57.12
.1	23.00	40.07	12.1	61.45	57.57	12.2	53.40	7.43	12.2	40.62	33.12	12.3	49.00	57.40
.1	22.90	39.71	13.1	61.12	57.29	13.1	51.99	7.24	13.2	40.43	33.10	13.3	48.62	57.64
.1	22.83	39.35	14.1	60.82	57.00	14.1	50.68	7.04	14.2	40.26	33.06	14.3	48.25	57.86
.1	22.76	39.01	15.1	60.55	56.72	15.1	49.47	6.86	15.2	40.09	33.01	15.3	47.90	58.06
.1	22.69	38.69	16.1	60.29	56.47	16.1	48.33	6.68	16.2	39.92	32.98	16.3	47.58	58.26
.0	22.62	38.39	17.1	60.04	56.23	17.1	47.23	6.52	17.2	39.77	32.95	17.3	47.27	58.45
.0	22.55	38.11	18.1	59.78	56.01	18.1	46.12	6.38	18.2	39.63	32.94	18.3	46.99	58.65
.0	22.48	37.83	19.1	59.52	55.79	19.1	44.99	6.24	19.2	39.48	32.94	19.3	46.72	58.86
0.0	22.39	37.54	20.1	59.24	55.57	20.1	43.81	6.11	20.2	39.32	32.93	20.3	46.43	59.08
1.0	22.30	37.24	21.1	58.95	55.35	21.1	42.59	5.97	21.2	39.16	32.94	21.3	46.13	59.31
2.0	22.22	36.93	22.1	58.64	55.11	22.1	41.32	5.82	22.2	38.99	32.93	22.3	45.81	59.55
3.0	22.14	36.59	23.1	58.34	54.85	23.1	40.02	5.65	23.2	38.81	32.92	23.3	45.46	59.78
4.0	22.05	36.24	24.1	58.05	54.57	24.1	38.72	5.46	24.2	38.63	32.89	24.3	45.09	60.00
5.0	21.98	35.87	25.1	57.76	54.27	25.1	37.44	5.25	25.2	38.45	32.83	25.3	44.71	60.21
6.0	21.92	35.51	26.1	57.49	53.96	26.1	36.20	5.02	26.2	38.27	32.75	26.3	44.32	60.40
7.0	21.86	35.13	27.1	57.24	53.63	27.1	35.00	4.77	27.2	38.09	32.65	27.3	43.91	60.58
28.0	21.82	34.75	28.1	57.01	53.30	28.1	33.88	4.52	28.2	37.92	32.54	28.3	43.50	60.73
29.0	21.79	34.37	29.1	56.81	52.97	29.1	32.83	4.26	29.2	37.76	32.42	29.3	43.09	60.86
30.0	21.76	34.01	30.1	56.63	52.66	30.1	31.87	4.01	30.2	37.61	32.30	30.3	42.71	60.98
31.0	21.73	33.67	31.1	56.45	52.37	31.1	30.96	3.78	31.2	37.47	32.18	31.3	42.35	61.10
	7.35	+7.28		16.94	+16.91		58.38	+58.37		7.39	+7.33		18.19	+18.17
	$16^h\ 54^m$	$37^s.997$		$17^h\ 59^m$	$40^s.30$		$19^h\ 5^m$	$3^s.27$		$20^h\ 48^m$	$48^s.820$		$23^h\ 27^m$	$44^s.653$
	+82° 10′	44″.05		+86° 36′	51″.19		+89° 0′	51″.13		+82° 13′	2″.89		+86° 50′	19″.16

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	De ati No
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Dec.	16 54	+82 10	Dec.	17 58	+86 36	Dec.	19 2	+89 0	Dec.	20 48	+82 13	Dec.	23 27	+86
	s	″		s	″		s	″		s	″		s	″
1.0	21.73	33.67	1.1	56.45	52.37	1.1	30.96	63.78	1.2	37.47	32.18	1.3	42.35	1.1
2.0	21.70	33.35	2.1	56.27	52.10	2.1	30.07	63.56	2.2	37.33	32.08	2.3	42.02	1.2
3.0	21.67	33.05	3.1	56.09	51.84	3.1	29.15	63.36	3.2	37.19	31.99	3.3	41.71	1.3
4.0	21.62	32.75	4.0	55.89	51.59	4.1	28.20	63.18	4.2	37.04	31.92	4.3	41.39	1.5
5.0	21.57	32.43	5.0	55.67	51.33	5.1	27.18	62.99	5.2	36.90	31.86	5.3	41.06	1.6
5.9	21.51	32.09	6.0	55.43	51.05	6.1	26.07	62.79	6.2	36.75	31.80	6.3	40.71	1.8
6.9	21.45	31.74	7.0	55.18	50.75	7.1	24.91	62.57	7.2	36.58	31.72	7.3	40.33	2.0
7.9	21.41	31.36	8.0	54.94	50.42	8.1	23.76	62.32	8.2	36.40	31.61	8.3	39.92	2.2
8.9	21.38	30.95	9.0	54.73	50.07	9.1	22.64	62.04	9.2	36.23	31.47	9.3	39.47	2.3
9.9	21.35	30.54	10.0	54.54	49.70	10.1	21.62	61.74	10.1	36.05	31.31	10.3	39.02	2.4
10.9	21.34	30.13	11.0	54.39	49.33	11.1	20.70	61.43	11.1	35.89	31.12	11.3	38.57	2.5
11.9	21.35	29.75	12.0	54.27	48.97	12.1	19.90	61.13	12.1	35.75	30.92	12.3	38.14	2.5
12.9	21.36	29.38	13.0	54.17	48.63	13.1	19.20	60.83	13.1	35.62	30.72	13.3	37.74	2.6
13.9	21.37	29.03	14.0	54.08	48.31	14.1	18.56	60.55	14.1	35.49	30.52	14.2	37.36	2.6
14.9	21.39	28.71	15.0	54.00	48.01	15.1	17.94	60.29	15.1	35.38	30.35	15.2	37.02	2.6
15.9	21.39	28.39	16.0	53.91	47.72	16.1	17.31	60.04	16.1	35.26	30.19	16.2	36.68	2.7
16.9	21.40	28.08	17.0	53.81	47.43	17.1	16.65	59.80	17.1	35.14	30.03	17.2	36.34	2.8
17.9	21.40	27.76	18.0	53.70	47.14	18.1	15.96	59.56	18.1	35.02	29.88	18.2	36.00	2.8
18.9	21.39	27.43	19.0	53.58	46.84	19.1	15.22	59.31	19.1	34.89	29.72	19.2	35.64	2.9
19.9	21.39	27.09	20.0	53.46	46.53	20.0	14.46	59.04	20.1	34.76	29.56	20.2	35.26	3.0
20.9	21.39	26.73	21.0	53.33	46.19	21.0	13.69	58.76	21.1	34.62	29.38	21.2	34.85	3.0
21.9	21.40	26.36	21.9	53.22	45.84	22.0	12.93	58.45	22.1	34.48	29.18	22.2	34.43	3.1
22.9	21.41	25.98	22.9	53.12	45.49	23.0	12.22	58.13	23.1	34.34	28.96	23.2	34.00	3.1
23.9	21.43	25.59	23.9	53.05	45.12	24.0	11.56	57.79	24.1	34.21	28.72	24.2	33.56	3.1
24.9	21.47	25.20	24.9	53.00	44.74	25.0	10.96	57.45	25.1	34.08	28.47	25.2	33.11	3.1
25.9	21.51	24.82	25.9	52.97	44.36	26.0	10.47	57.11	26.1	33.96	28.21	26.2	32.68	3.1
26.9	21.57	24.46	26.9	52.97	43.99	27.0	10.05	56.77	27.1	33.85	27.93	27.2	32.27	3.0
27.9	21.63	24.12	27.9	52.98	43.65	28.0	9.71	56.44	28.1	33.75	27.67	28.2	31.88	3.0
28.9	21.69	23.81	28.9	53.00	43.33	29.0	9.41	56.13	29.1	33.66	27.42	29.2	31.52	2.97
29.9	21.74	23.51	29.9	53.01	43.03	30.0	9.11	55.85	30.1	33.57	27.18	30.2	31.18	2.93
30.9	21.78	23.21	30.9	53.01	42.74	31.0	8.79	55.58	31.1	33.48	26.97	31.2	30.85	2.90
31.9	21.82	22.92	31.9	53.00	42.45	32.0	8.39	55.32	32.1	33.40	26.77	32.2	30.52	2.88
	7.34	+7.27		16.93	+16.90		58.28	+58.27		7.39	+7.32		18.20	+18.1
	$16^h\ 54^m$	$37^s.997$		$17^h\ 59^m$	$40^s.30$		$19^h\ 5^m$	$3^s.27$		$20^h\ 48^m$	$48^s.820$		$23^h\ 27^m$	$44^s.65$
	+82° 10′	44″.05		+86° 36′	51″.19		+89° 0′	51″.13		+82° 13′	2″.89		+86° 50′	19″.16

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**33 Piscium.** Mag. 4.7				**α Andromedæ.** (*Alpheratz.*) Mag. 2.2				**β Cassiopeiæ.** Mag. 2.4				**ε Phœnicis.** Mag. 3.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 0 0		° ′ − 6 10		h m 0 3		° ′ +28 37		h m 0 4		° ′ +58 40		h m 0 5		° ′ −46 12	
	s		″		s		″		s		″		s		″	
an. 0.2	59.52		58.9		59.53		28.5		37.47		71.9		6.79		71.2	
10.2	59.42	10	59.4	5	59.40	13	27.6	9	37.17	30	71.2	7	6.60	19	70.8	4
20.2	59.33	9	59.8	4	59.28	12	26.5	11	36.88	29	70.0	12	6.42	18	69.9	9
30.1	59.25	8	60.1	3	59.17	11	25.2	13	36.62	26	68.4	16	6.26	16	68.6	13
eb. 9.1	59.18	7	60.3	2	59.07	10	23.7	15	36.39	23	66.3	21	6.14	12	66.9	17
19.1	59.14	4	60.2	1	59.01	6	22.1	16	36.21	18	63.9	24	6.04	10	64.9	20
ar. 1.1	59.12	2	60.0	2	58.97	4	20.5	16	36.09	12	61.4	25	5.98	6	62.5	24
11.0	59.13	1	59.5	5	58.97	0	19.0	15	36.04	5	58.7	27	5.97	1	59.8	27
21.0	59.18	5	58.8	7	59.01	4	17.6	14	36.07	3	56.0	27	6.00	3	56.9	29
31.0	59.26	8	57.9	9	59.10	9	16.5	11	36.17	10	53.5	25	6.08	8	53.9	30
pr. 10.0	59.39	13	56.7	12	59.23	13	15.6	9	36.36	19	51.2	23	6.21	13	50.7	32
19.9	59.55	16	55.3	14	59.41	18	15.0	6	36.62	26	49.3	19	6.39	18	47.6	31
29.9	59.75	20	53.7	16	59.63	22	14.9	1	36.95	33	47.8	15	6.62	23	44.4	32
ay 9.9	59.98	23	51.9	18	59.89	26	15.1	2	37.34	39	46.7	11	6.90	28	41.3	31
19.8	60.25	27	49.9	20	60.19	30	15.7	6	37.79	45	46.1	6	7.22	32	38.4	29
29.8	60.54	29	47.9	20	60.51	32	16.7	10	38.27	48	46.0	1	7.58	36	35.8	26
une 8.8	60.85	31	45.7	22	60.86	35	18.0	13	38.78	51	46.5	5	7.96	38	33.4	24
18.8	61.17	32	43.6	21	61.21	35	19.7	17	39.31	53	47.5	10	8.37	41	31.3	21
28.7	61.49	32	41.5	21	61.56	35	21.6	19	39.83	52	49.0	15	8.78	41	29.7	16
uly 8.7	61.81	32	39.5	20	61.91	35	23.8	22	40.34	51	50.9	19	9.19	41	28.5	12
18.7	62.11	30	37.7	18	62.24	33	26.2	24	40.82	48	53.2	23	9.58	39	27.7	8
28.7	62.40	29	36.1	16	62.54	30	28.7	25	41.26	44	55.9	27	9.95	37	27.5	2
ug. 7.6	62.65	25	34.7	14	62.82	28	31.2	25	41.66	40	58.9	30	10.29	34	27.7	2
17.6	62.88	23	33.5	12	63.06	24	33.8	26	42.00	34	62.1	32	10.59	30	28.3	6
27.6	63.07	19	32.6	9	63.26	20	36.3	25	42.29	29	65.5	34	10.83	24	29.4	11
ept. 6.5	63.22	15	32.0	6	63.42	16	38.7	24	42.51	22	68.9	34	11.02	19	30.9	15
16.5	63.33	11	31.6	4	63.54	12	41.0	23	42.67	16	72.4	35	11.16	14	32.7	18
26.5	63.40	7	31.5	1	63.62	8	43.2	22	42.76	9	75.8	34	11.24	8	34.8	21
Oct. 6.5	63.43	3	31.7	2	63.66	4	45.1	19	42.80	4	79.1	33	11.26	2	37.0	22
16.4	63.44	1	32.0	3	63.66	0	46.8	17	42.77	3	82.2	31	11.23	3	39.3	23
26.4	63.41	3	32.5	5	63.64	2	48.2	14	42.69	8	85.0	28	11.15	8	41.6	23
Nov. 5.4	63.36	5	33.1	6	63.59	5	49.3	11	42.55	14	87.6	26	11.03	12	43.7	21
15.4	63.29	7	33.8	7	63.51	8	50.2	9	42.37	18	89.7	21	10.88	15	45.6	19
25.3	63.20	9	34.5	7	63.41	10	50.7	5	42.15	22	91.4	17	10.70	18	47.2	16
Dec. 5.3	63.11	9	35.3	8	63.30	11	51.0	3	41.90	25	92.7	13	10.51	19	48.5	13
15.3	63.01	10	36.0	7	63.18	12	50.9	1	41.62	28	93.4	7	10.30	21	49.3	8
25.2	62.90	11	36.7	7	63.05	13	50.5	4	41.33	29	93.6	2	10.09	21	49.7	4
35.2	62.80	10	37.3	6	62.92	13	49.8	7	41.03	30	93.3	3	9.89	20	49.6	1
ec δ, Tan δ	1.006		−0.108		1.139		+0.546		1.924		+1.644		1.445		−1.043	
lean Place	59s.112		59″.04		59s.450		16″.23		38s.056		51″.55		5s.987		59″.41	
D′ψα, Dωα	0.00		+0.01		0.00		−0.04		0.00		−0.11		0.00		+0.07	
Dψδ, Dωδ	+0.4		0.0		+0.4		0.0		+0.4		0.0		+0.4		0.0	

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Decl
	h m	° '		h m	° '		h m	° '		h m	° '		h m	°
Apr.	16 54	+82 10	Apr.	17 59	+86 36	Apr.	19 4	+89 0	Apr.	20 48	+82 12	Apr.	23 27	+86
	s	"		s	"		s	"		s	"		s	"
0.7	40.71	16.32	0.7	36.21	24.28	0.8	18.07	26.93	0.8	39.71	45.61	0.9	13.56	19.7
1.7	40.85	16.53	1.7	36.56	24.41	1.8	19.36	26.97	1.8	39.87	45.50	1.9	13.77	19.4
2.7	40.98	16.74	2.7	36.88	24.54	2.8	20.55	27.01	2.8	40.02	45.41	2.9	13.98	19.2
3.7	41.09	16.94	3.7	37.18	24.67	3.8	21.64	27.06	3.8	40.15	45.34	3.9	14.18	18.9
4.7	41.19	17.12	4.7	37.47	24.78	4.8	22.68	27.10	4.8	40.29	45.26	4.9	14.36	18.7
5.7	41.30	17.28	5.7	37.75	24.88	5.8	23.67	27.12	5.8	40.42	45.17	5.9	14.51	18.5
6.7	41.40	17.43	6.7	38.04	24.96	6.8	24.69	27.12	6.8	40.55	45.06	6.9	14.64	18.3
7.7	41.52	17.57	7.7	38.35	25.02	7.8	25.77	27.11	7.8	40.67	44.93	7.9	14.77	18.0
8.7	41.65	17.71	8.7	38.69	25.09	8.8	26.90	27.09	8.8	40.81	44.79	8.9	14.91	17.7
9.7	41.80	17.87	9.7	39.04	25.17	9.7	28.13	27.08	9.8	40.95	44.65	9.9	15.07	17.4
10.7	41.95	18.06	10.7	39.40	25.27	10.7	29.41	27.09	10.8	41.11	44.52	10.9	15.25	17.1
11.7	42.09	18.28	11.7	39.77	25.40	11.7	30.75	27.12	11.8	41.27	44.41	11.9	15.46	16.8
12.6	42.23	18.52	12.7	40.14	25.55	12.7	32.10	27.18	12.8	41.44	44.32	12.9	15.71	16.5
13.6	42.36	18.77	13.7	40.50	25.72	13.7	33.42	27.26	13.8	41.61	44.25	13.9	15.98	16.3
14.6	42.49	19.04	14.7	40.83	25.91	14.7	34.70	27.36	14.8	41.79	44.20	14.9	16.27	16.0
15.6	42.60	19.31	15.7	41.15	26.11	15.7	35.94	27.47	15.8	41.97	44.17	15.9	16.55	15.8
16.6	42.70	19.57	16.7	41.45	26.31	16.7	37.11	27.59	16.8	42.13	44.16	16.9	16.84	15.6
17.6	42.79	19.83	17.7	41.73	26.50	17.7	38.21	27.71	17.8	42.29	44.14	17.9	17.12	15.3
18.6	42.88	20.08	18.7	41.99	26.69	18.7	39.27	27.82	18.8	42.44	44.14	18.9	17.38	15.2
19.6	42.97	20.31	19.7	42.25	26.87	19.7	40.28	27.92	19.8	42.59	44.12	19.9	17.63	15.0
20.6	43.06	20.53	20.7	42.51	27.03	20.7	41.28	28.01	20.8	42.73	44.10	20.9	17.87	14.8
21.6	43.16	20.74	21.7	42.77	27.19	21.7	42.28	28.09	21.8	42.87	44.06	21.9	18.09	14.6
22.6	43.26	20.96	22.7	43.05	27.34	22.7	43.32	28.16	22.8	43.01	44.02	22.9	18.31	14.4
23.6	43.36	21.18	23.7	43.34	27.49	23.7	44.42	28.23	23.8	43.16	43.97	23.9	18.54	14.1
24.6	43.47	21.41	24.7	43.64	27.65	24.7	45.57	28.32	24.8	43.32	43.93	24.9	18.79	13.9
25.6	43.58	21.67	25.7	43.95	27.84	25.7	46.77	28.43	25.8	43.49	43.90	25.9	19.07	13.7
26.6	43.69	21.96	26.7	44.26	28.06	26.7	48.00	28.56	26.8	43.67	43.89	26.9	19.39	13.4
27.6	43.78	22.27	27.7	44.56	28.31	27.7	49.22	28.72	27.8	43.85	43.91	27.9	19.74	13.2
28.6	43.86	22.59	28.7	44.83	28.57	28.7	50.37	28.91	28.8	44.03	43.96	28.9	20.10	13.0
29.6	43.93	22.92	29.6	45.07	28.84	29.7	51.44	29.11	29.8	44.20	44.03	29.9	20.47	12.93
30.6	43.99	23.24	30.6	45.29	29.12	30.7	52.41	29.32	30.8	44.36	44.13	30.9	20.84	12.80
31.6	44.03	23.55	31.6	45.48	29.39	31.7	53.28	29.53	31.8	44.52	44.22	31.9	21.18	12.68
	7.34	+7.27		16.90	+16.87		57.74	+57.73		7.38	+7.31		18.13	+18.10
	$16^h\ 54^m$	$37^s.997$		$17^h\ 59^m$	$40^s.30$		$19^h\ 5^m$	$3^s.27$		$20^h\ 48^m$	$48^s.820$		$23^h\ 27^m$	$44^s.653$
	+82° 10′	44″.05		+86° 36′	51″.19		+89° 0′	51″.13		+82° 13′	2″.89		+86° 50′	19″.16

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

sæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
	Right Ascension.	**Declination *North.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *North.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *North.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *North.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *North.***
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
y	16 54	+82 10	May	17 59	+86 36	May	19 4	+89 0	May	20 48	+82 12	May	23 27	+86 50
	s	″		s	″		s	″		s	″		s	″
.6	43.99	23.24	0.6	45.29	29.12	0.7	52.41	29.32	0.8	44.36	44.13	0.9	20.84	12.80
.6	44.03	23.55	1.6	45.48	29.39	1.7	53.28	29.53	1.8	44.52	44.22	1.9	21.18	12.68
.6	44.08	23.83	2.6	45.66	29.63	2.7	54.09	29.72	2.8	44.66	44.31	2.9	21.49	12.58
.6	44.13	24.09	3.6	45.83	29.85	3.7	54.89	29.89	3.8	44.80	44.38	3.9	21.78	12.47
.6	44.19	24.34	4.6	46.02	30.05	4.7	55.71	30.03	4.8	44.93	44.43	4.9	22.05	12.34
.6	44.26	24.59	5.6	46.23	30.25	5.7	56.57	30.17	5.7	45.07	44.47	5.9	22.33	12.19
.6	44.33	24.84	6.6	46.46	30.46	6.7	57.52	30.31	6.7	45.22	44.51	6.9	22.61	12.03
.6	44.41	25.11	7.6	46.70	30.68	7.7	58.55	30.46	7.7	45.38	44.54	7.9	22.92	11.86
.6	44.49	25.41	8.6	46.96	30.92	8.7	59.61	30.63	8.7	45.55	44.59	8.9	23.25	11.68
.6	44.56	25.74	9.6	47.21	31.19	9.7	60.70	30.82	9.7	45.72	44.65	9.8	23.62	11.52
.6	44.63	26.08	10.6	47.44	31.48	10.7	61.77	31.04	10.7	45.89	44.74	10.8	24.01	11.37
.6	44.69	26.43	11.6	47.66	31.79	11.7	62.78	31.28	11.7	46.07	44.85	11.8	24.42	11.24
.6	44.73	26.79	12.6	47.86	32.11	12.7	63.74	31.54	12.7	46.25	44.99	12.8	24.83	11.13
.6	44.76	27.14	13.6	48.03	32.43	13.7	64.62	31.80	13.7	46.41	45.14	13.8	25.24	11.04
.6	44.79	27.48	14.6	48.19	32.74	14.7	65.42	32.05	14.7	46.56	45.29	14.8	25.63	10.96
.6	44.81	27.81	15.6	48.32	33.04	15.6	66.17	32.31	15.7	46.71	45.46	15.8	26.00	10.89
.6	44.83	28.13	16.6	48.44	33.33	16.6	66.86	32.55	16.7	46.85	45.61	16.8	26.37	10.84
.6	44.85	28.43	17.6	48.56	33.61	17.6	67.53	32.78	17.7	46.98	45.76	17.8	26.71	10.79
.6	44.87	28.71	18.6	48.68	33.87	18.6	68.17	33.00	18.7	47.11	45.90	18.8	27.04	10.74
.5	44.90	28.99	19.6	48.81	34.12	19.6	68.84	33.21	19.7	47.25	46.02	19.8	27.35	10.67
0.5	44.94	29.27	20.6	48.95	34.37	20.6	69.55	33.42	20.7	47.38	46.13	20.8	27.68	10.60
1.5	44.97	29.56	21.6	49.11	34.63	21.6	70.31	33.63	21.7	47.52	46.25	21.8	28.02	10.51
2.5	45.01	29.87	22.6	49.28	34.90	22.6	71.11	33.85	22.7	47.67	46.38	22.8	28.38	10.42
3.5	45.05	30.20	23.6	49.44	35.20	23.6	71.96	34.09	23.7	47.83	46.52	23.8	28.77	10.33
4.5	45.08	30.55	24.6	49.60	35.53	24.6	72.79	34.36	24.7	47.99	46.69	24.8	29.18	10.26
5.5	45.10	30.93	25.6	49.73	35.88	25.6	73.56	34.66	25.7	48.15	46.88	25.8	29.62	10.22
6.5	45.09	31.31	26.6	49.83	36.24	26.6	74.25	34.98	26.7	48.31	47.11	26.8	30.07	10.21
7.5	45.08	31.68	27.6	49.90	36.60	27.6	74.83	35.32	27.7	48.46	47.35	27.8	30.52	10.22
8.5	45.05	32.03	28.6	49.94	36.95	28.6	75.29	35.64	28.7	48.59	47.61	28.8	30.94	10.25
9.5	45.02	32.35	29.6	49.96	37.27	29.6	75.68	35.95	29.7	48.71	47.86	29.8	31.33	10.29
0.5	45.00	32.65	30.6	49.97	37.58	30.6	76.02	36.24	30.7	48.82	48.09	30.8	31.70	10.34
1.5	44.97	32.94	31.6	49.99	37.87	31.6	76.35	36.50	31.7	48.92	48.30	31.8	32.03	10.38
	7.34	+7.28		16.91	+16.88		57.82	+57.81		7.38	+7.31		18.12	+18.09
	$6^{h}\ 54^{m}$	$37^{s}.997$		$17^{h}\ 59^{m}$	$40^{s}.30$		$19^{h}\ 5^{m}$	$3^{s}.27$		$20^{h}\ 48^{m}$	$48^{s}.820$		$23^{h}\ 27^{m}$	$44^{s}.653$
	$2^{\circ}\ 10'$	$44''.05$		$+86^{\circ}\ 36'$	$51''.19$		$+89^{\circ}\ 0'$	$51''.13$		$+82^{\circ}\ 13'$	$2''.89$		$+86^{\circ}\ 50'$	$19''.16$

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris.
Mag. 4.4

Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′
June	16 54	+82 10
	s	″
0.5	44.97	32.94
1.5	44.96	33.22
2.5	44.96	33.49
3.5	44.95	33.77
4.5	44.95	34.08
5.5	44.95	34.42
6.5	44.94	34.77
7.5	44.92	35.13
8.5	44.90	35.49
9.5	44.86	35.85
10.5	44.81	36.20
11.5	44.76	36.54
12.5	44.71	36.86
13.5	44.65	37.16
14.5	44.59	37.44
15.5	44.54	37.71
16.5	44.50	37.97
17.5	44.46	38.24
18.5	44.42	38.53
19.5	44.38	38.83
20.5	44.34	39.15
21.5	44.29	39.49
22.5	44.22	39.84
23.5	44.14	40.18
24.4	44.05	40.51
25.4	43.94	40.82
26.4	43.83	41.10
27.4	43.73	41.35
28.4	43.64	41.58
29.4	43.57	41.81
30.4	43.49	42.05
31.4	43.42	42.30

7.35 +7.28
$16^h\ 54^m$ $37^s.997$
$+82^\circ\ 10'$ $44''.05$

δ Ursæ Minoris.
Mag. 4.4

Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′
June	17 59	+86 36
	s	″
0.6	49.99	37.87
1.6	50.02	38.14
2.6	50.08	38.41
3.6	50.15	38.69
4.5	50.24	38.98
5.5	50.33	39.30
6.5	50.40	39.64
7.5	50.45	39.99
8.5	50.49	40.36
9.5	50.51	40.73
10.5	50.50	41.09
11.5	50.47	41.44
12.5	50.43	41.77
13.5	50.37	42.09
14.5	50.32	42.40
15.5	50.27	42.69
16.5	50.24	42.97
17.5	50.21	43.25
18.5	50.20	43.54
19.5	50.19	43.86
20.5	50.18	44.20
21.5	50.15	44.56
22.5	50.09	44.93
23.5	49.99	45.30
24.5	49.87	45.67
25.5	49.72	46.02
26.5	49.56	46.34
27.5	49.40	46.64
28.5	49.25	46.91
29.5	49.12	47.18
30.5	49.00	47.46
31.5	48.90	47.74

16.92 +16.89
$17^h\ 59^m$ $40^s.30$
$+86^\circ\ 36'$ $51''.19$

λ Ursæ Minoris.
Mag. 6.6

Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′
June	19 5	+89 0
	s	″
0.6	16.35	36.50
1.6	16.72	36.75
2.6	17.18	36.99
3.6	17.70	37.24
4.6	18.26	37.50
5.6	18.86	37.78
6.6	19.45	38.08
7.6	19.99	38.41
8.6	20.47	38.75
9.6	20.87	39.10
10.6	21.20	39.45
11.6	21.44	39.79
12.6	21.63	40.11
13.6	21.78	40.43
14.6	21.89	40.74
15.6	22.01	41.03
16.6	22.16	41.30
17.6	22.35	41.58
18.6	22.60	41.86
19.6	22.88	42.16
20.6	23.17	42.48
21.5	23.42	42.84
22.5	23.60	43.21
23.5	23.67	43.59
24.5	23.62	43.97
25.5	23.46	44.34
26.5	23.23	44.69
27.5	22.98	45.01
28.5	22.76	45.30
29.5	22.60	45.59
30.5	22.51	45.88
31.5	22.47	46.18

57.96 +57.95
$19^h\ 5^m$ $3^s.27$
$+89^\circ\ 0'$ $51''.13$

76 Draconis.
Mag. 5.7

Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′
June	20 48	+82 12
	s	″
0.7	48.92	48.30
1.7	49.02	48.50
2.7	49.14	48.68
3.7	49.27	48.86
4.7	49.39	49.05
5.7	49.53	49.26
6.7	49.67	49.49
7.7	49.81	49.74
8.7	49.95	50.01
9.7	50.08	50.29
10.7	50.20	50.58
11.6	50.31	50.87
12.6	50.41	51.17
13.6	50.51	51.45
14.6	50.60	51.72
15.6	50.68	51.98
16.6	50.77	52.23
17.6	50.86	52.48
18.6	50.96	52.72
19.6	51.08	52.97
20.6	51.19	53.25
21.6	51.30	53.55
22.6	51.41	53.89
23.6	51.51	54.24
24.6	51.59	54.60
25.6	51.66	54.96
26.6	51.72	55.32
27.6	51.77	55.65
28.6	51.82	55.96
29.6	51.87	56.25
30.6	51.93	56.53
31.6	52.00	56.82

7.38 +7.31
$20^h\ 48^m$ $48^s.820$
$+82^\circ\ 13'$ $2''.89$

39 H. Cephei.
Mag. 5.6

Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	°
June	23 27	+86
	s	″
0.8	32.03	[illegible]
1.8	32.36	[illegible]
2.8	32.69	[illegible]
3.8	33.04	[illegible]
4.8	33.41	[illegible]
5.8	33.81	[illegible]
6.8	34.24	[illegible]
7.8	34.68	[illegible]
8.8	35.11	[illegible]
9.8	35.56	[illegible]
10.8	35.99	[illegible]
11.8	36.40	[illegible]
12.8	36.79	[illegible]
13.8	37.16	[illegible]
14.7	37.52	[illegible]
15.7	37.86	[illegible]
16.7	38.19	[illegible]
17.7	38.52	[illegible]
18.7	38.87	[illegible]
19.7	39.25	[illegible]
20.7	39.66	[illegible]
21.7	40.09	11.54
22.7	40.53	11.67
23.7	40.97	11.82
24.7	41.39	12.00
25.7	41.77	12.21
26.7	42.12	12.42
27.7	42.45	12.61
28.7	42.76	12.80
29.7	43.06	12.96
30.7	43.37	13.10
31.7	43.69	13.24

18.12 +18.09
$23^h\ 27^m$ $44^s.653$
$+86^\circ\ 50'$ $19''.16$

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
an lar te.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
ly	16 54	+82 10	July	17 59	+86 36	July	19 5	+89 0	July	20 48	+82 12	July	23 27	+86 50
	s	″		s	″		s	″		s	″		s	″
0.4	43.49	42.05	0.5	49.00	47.46	0.5	22.51	45.88	0.6	51.93	56.53	0.7	43.37	13.10
1.4	43.42	42.30	1.5	48.90	47.74	1.5	22.47	46.18	1.6	52.00	56.82	1.7	43.69	13.24
2.4	43.35	42.57	2.5	48.81	48.04	2.5	22.47	46.49	2.6	52.08	57.11	2.7	44.05	13.38
3.4	43.28	42.86	3.5	48.72	48.36	3.5	22.48	46.82	3.6	52.16	57.42	3.7	44.43	13.53
4.4	43.19	43.16	4.5	48.61	48.70	4.5	22.46	47.17	4.6	52.25	57.75	4.7	44.82	13.69
5.4	43.10	43.47	5.5	48.49	49.05	5.5	22.38	47.54	5.6	52.33	58.10	5.7	45.22	13.87
6.4	43.00	43.78	6.5	48.34	49.40	6.5	22.22	47.91	6.6	52.39	58.47	6.7	45.62	14.07
7.4	42.89	44.08	7.5	48.16	49.74	7.5	21.98	48.28	7.6	52.45	58.84	7.7	46.00	14.29
8.4	42.76	44.35	8.5	47.97	50.07	8.5	21.66	48.64	8.6	52.50	59.22	8.7	46.37	14.52
9.4	42.64	44.61	9.5	47.76	50.38	9.5	21.28	48.99	9.6	52.55	59.60	9.7	46.71	14.77
0.4	42.51	44.85	10.5	47.54	50.68	10.5	20.85	49.34	10.6	52.58	59.97	10.7	47.03	15.02
1.4	42.39	45.06	11.4	47.31	50.97	11.5	20.38	49.66	11.6	52.60	60.32	11.7	47.33	15.28
2.4	42.27	45.27	12.4	47.10	51.23	12.5	19.91	49.97	12.6	52.62	60.66	12.7	47.61	15.52
3.4	42.15	45.46	13.4	46.89	51.48	13.5	19.45	50.26	13.6	52.64	60.98	13.7	47.88	15.75
4.4	42.04	45.65	14.4	46.69	51.73	14.5	19.04	50.54	14.6	52.67	61.30	14.7	48.15	15.97
5.4	41.94	45.85	15.4	46.51	51.98	15.5	18.68	50.83	15.6	52.70	61.61	15.7	48.42	16.18
16.4	41.84	46.07	16.4	46.33	52.25	16.5	18.37	51.13	16.6	52.74	61.92	16.7	48.72	16.39
17.4	41.74	46.31	17.4	46.15	52.53	17.5	18.06	51.45	17.5	52.79	62.25	17.7	49.04	16.60
18.4	41.62	46.55	18.4	45.96	52.83	18.5	17.76	51.78	18.5	52.83	62.61	18.7	49.38	16.82
19.4	41.50	46.82	19.4	45.76	53.15	19.5	17.40	52.13	19.5	52.87	62.99	19.7	49.74	17.07
20.4	41.36	47.08	20.4	45.53	53.49	20.5	16.94	52.50	20.5	52.91	63.39	20.7	50.10	17.34
21.4	41.22	47.33	21.4	45.26	53.81	21.5	16.37	52.88	21.5	52.94	63.80	21.6	50.44	17.64
22.4	41.06	47.55	22.4	44.96	54.11	22.5	15.67	53.24	22.5	52.94	64.22	22.6	50.76	17.96
23.4	40.90	47.75	23.4	44.64	54.39	23.5	14.90	53.59	23.5	52.93	64.63	23.6	51.04	18.30
24.4	40.73	47.92	24.4	44.32	54.64	24.5	14.09	53.91	24.5	52.92	65.02	24.6	51.28	18.62
25.4	40.58	48.06	25.4	44.01	54.86	25.5	13.28	54.20	25.5	52.89	65.38	25.6	51.49	18.94
26.4	40.44	48.20	26.4	43.71	55.07	26.5	12.51	54.47	26.5	52.88	65.72	26.6	51.70	19.23
27.4	40.31	48.33	27.4	43.44	55.28	27.5	11.81	54.73	27.5	52.87	66.05	27.6	51.90	19.51
28.4	40.18	48.48	28.4	43.19	55.49	28.4	11.20	54.99	28.5	52.85	66.37	28.6	52.12	19.77
29.4	40.05	48.64	29.4	42.95	55.72	29.4	10.62	55.27	29.5	52.86	66.70	29.6	52.37	20.03
30.4	39.92	48.82	30.4	42.71	55.96	30.4	10.05	55.57	30.5	52.87	67.03	30.6	52.63	20.29
31.3	39.79	49.01	31.4	42.46	56.23	31.4	9.49	55.88	31.5	52.88	67.39	31.6	52.92	20.56
	7.35	+7.28		16.93	+16.90		58.12	+58.11		7.38	+7.32		18.13	+18.10
	16^{h} 54^{m}	$37^{s}.997$		17^{h} 59^{m}	$40^{s}.30$		19^{h} 5^{m}	$3^{s}.27$		20^{h} 48^{m}	$48^{s}.820$		23^{h} 27^{m}	$44^{s}.653$
	+82° 10′	44″.05		+86° 36′	51″.19		+89° 0′	51″.13		+82° 13′	2″.89		+86° 50′	19″.16

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Decl nati *Nort*
	h m	° '		h m	° '		h m	° '		h m	° '		h m	°
Aug.	16 54	+82 10	Aug.	17 59	+86 36	Aug.	19 4	+89 0	Aug.	20 48	+82 13	Aug.	23 27	+86
	s	"		s	"		s	"		s	"		s	"
0.3	39.79	49.01	0.4	42.46	56.23	0.4	69.49	55.88	0.5	52.88	7.39	0.6	52.92	20.9
1.3	39.65	49.22	1.4	42.19	56.50	1.4	68.87	56.21	1.5	52.89	7.78	1.6	53.22	20.8
2.3	39.50	49.42	2.4	41.90	56.78	2.4	68.19	56.55	2.5	52.89	8.18	2.6	53.51	21.1
3.3	39.33	49.61	3.4	41.59	57.05	3.4	67.42	56.89	3.5	52.88	8.58	3.6	53.79	21.4
4.3	39.17	49.79	4.4	41.27	57.32	4.4	66.59	57.22	4.5	52.87	8.98	4.6	54.05	21.8
5.3	38.99	49.94	5.4	40.92	57.57	5.4	65.69	57.54	5.5	52.84	9.38	5.6	54.29	22.1
6.3	38.82	50.08	6.4	40.56	57.79	6.4	64.73	57.85	6.5	52.80	9.77	6.6	54.51	22.5
7.3	38.65	50.19	7.4	40.20	58.00	7.4	63.74	58.13	7.5	52.76	10.15	7.6	54.70	22.9
8.3	38.48	50.29	8.4	39.84	58.18	8.4	62.74	58.40	8.5	52.71	10.51	8.6	54.87	23.3
9.3	38.31	50.37	9.4	39.50	58.35	9.4	61.75	58.65	9.5	52.66	10.86	9.6	55.02	23.6
10.3	38.16	50.44	10.4	39.16	58.51	10.4	60.79	58.89	10.5	52.61	11.19	10.6	55.16	23.9
11.3	38.01	50.53	11.4	38.84	58.67	11.4	59.87	59.12	11.5	52.56	11.52	11.6	55.31	24.2
12.3	37.86	50.62	12.4	38.52	58.84	12.4	59.02	59.37	12.5	52.52	11.84	12.6	55.47	24.5
13.3	37.71	50.72	13.4	38.22	59.03	13.4	58.20	59.62	13.5	52.50	12.16	13.6	55.66	24.8
14.3	37.56	50.85	14.4	37.91	59.23	14.4	57.39	59.89	14.5	52.47	12.51	14.6	55.87	25.1
15.3	37.40	50.98	15.4	37.58	59.45	15.4	56.54	60.18	15.5	52.44	12.88	15.6	56.09	25.4
16.3	37.23	51.12	16.3	37.23	59.68	16.4	55.62	60.49	16.5	52.41	13.27	16.6	56.31	25.8
17.3	37.05	51.26	17.3	36.86	59.92	17.4	54.60	60.81	17.5	52.38	13.68	17.6	56.53	26.2
18.3	36.86	51.37	18.3	36.46	60.15	18.4	53.47	61.12	18.5	52.32	14.09	18.6	56.73	26.6
19.3	36.66	51.46	19.3	36.03	60.34	19.4	52.25	61.41	19.5	52.24	14.50	19.6	56.89	27.0
20.3	36.47	51.51	20.3	35.60	60.50	20.4	50.96	61.67	20.5	52.16	14.89	20.6	57.02	27.4
21.3	36.28	51.53	21.3	35.17	60.63	21.4	49.67	61.90	21.5	52.08	15.25	21.6	57.11	27.8
22.3	36.10	51.53	22.3	34.76	60.74	22.4	48.41	62.11	22.5	51.98	15.58	22.6	57.18	28.2
23.3	35.92	51.54	23.3	34.37	60.84	23.4	47.22	62.30	23.4	51.89	15.89	23.6	57.24	28.59
24.3	35.76	51.55	24.3	34.00	60.95	24.4	46.10	62.49	24.4	51.81	16.19	24.6	57.32	28.93
25.3	35.61	51.58	25.3	33.65	61.07	25.4	45.05	62.70	25.4	51.75	16.50	25.6	57.42	29.26
26.3	35.45	51.63	26.3	33.31	61.21	26.4	44.05	62.92	26.4	51.69	16.81	26.6	57.54	29.50
27.3	35.29	51.68	27.3	32.96	61.36	27.4	43.04	63.15	27.4	51.62	17.13	27.5	57.67	29.92
28.3	35.12	51.75	28.3	32.60	61.52	28.4	41.99	63.39	28.4	51.56	17.47	28.5	57.82	30.27
29.3	34.95	51.83	29.3	32.22	61.69	29.4	40.90	63.64	29.4	51.51	17.83	29.5	57.97	30.65
30.3	34.76	51.89	30.3	31.83	61.85	30.4	39.74	63.90	30.4	51.43	18.21	30.5	58.10	31.03
31.3	34.57	51.93	31.3	31.41	62.01	31.4	38.50	64.15	31.4	51.35	18.57	31.5	58.23	31.43
	7.35	+7.28		16.94	+16.91		58.27	+58.26		7.39	+7.32		18.14	+18.12
	$16^{h}\ 54^{m}$	$37^{s}.997$		$17^{h}\ 59^{m}$	$40^{s}.30$		$19^{h}\ 5^{m}$	$3^{s}.27$		$20^{h}\ 48^{m}$	$48^{s}.820$		$23^{h}\ 27^{m}$	$44^{s}.653$
	+82° 10′	44″.05		+86° 36′	51″.19		+89° 0′	51″.13		+82° 13′	2″.89		+86° 50′	19″.16

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Ursæ Minoris. Mag. 4.4			δ Ursæ Minoris. Mag. 4.4			λ Ursæ Minoris. Mag. 6.6			76 Draconis. Mag. 5.7			39 H. Cephei. Mag. 5.6		
n r e.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
t.	16 54	+82 10	Sept.	17 59	+86 37	Sept.	19 3	+89 1	Sept.	20 48	+82 13	Sept.	23 27	+86 50
	s	″		s	″		s	″		s	″		s	″
.3	34.57	51.93	0.3	31.41	2.01	0.4	98.50	4.15	0.4	51.35	18.57	0.5	58.23	31.43
.3	34.38	51.96	1.3	30.98	2.14	1.4	97.19	4.39	1.4	51.26	18.93	1.5	58.33	31.84
.3	34.18	51.97	2.3	30.54	2.26	2.3	95.84	4.61	2.4	51.16	19.29	2.5	58.41	32.26
.3	33.99	51.96	3.3	30.09	2.36	3.3	94.46	4.81	3.4	51.05	19.64	3.5	58.45	32.66
.3	33.80	51.92	4.3	29.64	2.44	4.3	93.05	4.99	4.4	50.94	19.97	4.5	58.48	33.06
.2	33.61	51.87	5.3	29.20	2.49	5.3	91.66	5.16	5.4	50.82	20.27	5.5	58.49	33.45
.2	33.43	51.82	6.3	28.78	2.54	6.3	90.31	5.31	6.4	50.70	20.56	6.5	58.48	33.83
.2	33.26	51.76	7.3	28.37	2.58	7.3	88.98	5.45	7.4	50.59	20.84	7.5	58.47	34.20
.2	33.10	51.71	8.3	27.98	2.63	8.3	87.72	5.59	8.4	50.49	21.12	8.5	58.48	34.55
.2	32.94	51.68	9.3	27.61	2.69	9.3	86.52	5.74	9.4	50.39	21.39	9.5	58.50	34.90
.2	32.77	51.65	10.3	27.23	2.77	10.3	85.34	5.91	10.4	50.30	21.68	10.5	58.54	35.25
.2	32.60	51.65	11.3	26.85	2.86	11.3	84.15	6.10	11.4	50.21	21.99	11.5	58.61	35.61
.2	32.42	51.66	12.3	26.45	2.97	12.3	82.91	6.30	12.4	50.12	22.31	12.5	58.69	35.99
.2	32.23	51.66	13.3	26.01	3.08	13.3	81.59	6.52	13.4	50.02	22.65	13.5	58.76	36.40
.2	32.03	51.64	14.3	25.55	3.18	14.3	80.16	6.73	14.4	49.91	23.01	14.5	58.81	36.83
.2	31.83	51.59	15.3	25.07	3.26	15.3	78.64	6.93	15.4	49.79	23.35	15.5	58.82	37.27
.2	31.62	51.52	16.3	24.58	3.31	16.3	77.05	7.10	16.4	49.65	23.67	16.5	58.80	37.71
.2	31.41	51.42	17.3	24.10	3.32	17.3	75.44	7.23	17.4	49.50	23.98	17.5	58.75	38.15
.2	31.22	51.30	18.3	23.63	3.31	18.3	73.85	7.34	18.4	49.35	24.26	18.5	58.67	38.56
9.2	31.04	51.17	19.3	23.19	3.29	19.3	72.34	7.42	19.4	49.20	24.51	19.5	58.58	38.95
0.2	30.88	51.04	20.3	22.77	3.27	20.3	70.90	7.50	20.4	49.06	24.74	20.5	58.49	39.32
1.2	30.71	50.92	21.3	22.36	3.26	21.3	69.55	7.59	21.4	48.93	24.97	21.5	58.42	39.67
2.2	30.55	50.82	22.2	21.97	3.25	22.3	68.25	7.68	22.4	48.82	25.20	22.5	58.37	40.00
3.2	30.39	50.74	23.2	21.58	3.27	23.3	66.97	7.80	23.4	48.71	25.44	23.5	58.34	40.35
4.2	30.23	50.67	24.2	21.18	3.29	24.3	65.68	7.93	24.4	48.60	25.70	24.5	58.34	40.71
5.2	30.06	50.60	25.2	20.77	3.33	25.3	64.35	8.06	25.4	48.48	25.97	25.5	58.33	41.09
6.2	29.88	50.53	26.2	20.35	3.36	26.3	62.97	8.19	26.4	48.35	26.25	26.5	58.31	41.47
7.2	29.70	50.45	27.2	19.91	3.39	27.3	61.51	8.33	27.4	48.22	26.54	27.5	58.28	41.86
28.2	29.51	50.35	28.2	19.44	3.40	28.3	59.99	8.46	28.3	48.08	26.82	28.5	58.23	42.27
29.2	29.32	50.23	29.2	18.97	3.40	29.3	58.43	8.57	29.3	47.94	27.09	29.5	58.16	42.69
30.2	29.13	50.08	30.2	18.51	3.37	30.3	56.83	8.67	30.3	47.79	27.35	30.5	58.07	43.10
31.2	28.95	49.92	31.2	18.05	3.32	31.3	55.22	8.74	31.3	47.62	27.60	31.5	57.93	43.50
	7.35	+7.28		16.95	+16.92		58.38	+58.38		7.39	+7.32		18.16	+18.14
	$16^h\ 54^m$	$37^s.997$		$17^h\ 59^m$	$40^s.30$		$19^h\ 5^m$	$3^s.27$		$20^h\ 48^m$	$48^s.820$		$23^h\ 27^m$	$44^s.653$
	+82° 10′	44″.05		+86° 36′	51″.19		+89° 0′	51″.13		+82° 13′	2″.89		+86° 50′	19″.16

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei** Mag. 5.6		
Mean Solar Date.	**Right Ascension.**	**Declination** *North.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *North.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *North.*	**Mean Solar Date.**	**Right Ascension.**	**Declination** *North.*	**Mean Solar Date.**	**Right Ascension.**	**De**
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Oct.	16 54	+82 10	Oct.	17 59	+86 36	Oct.	19 3	+89 1	Oct.	20 48	+82 13	Oct.	23 27	+86
	s	″		s	″		s	″		s	″		s	″
0.2	29.13	50.08	0.2	18.51	63.37	0.3	56.83	8.67	0.3	47.79	27.35	0.5	58.07	43
1.2	28.95	49.92	1.2	18.05	63.32	1.3	55.22	8.74	1.3	47.62	27.60	1.5	57.93	43
2.2	28.78	49.75	2.2	17.59	63.25	2.3	53.62	8.79	2.3	47.45	27.82	2.4	57.79	43
3.2	28.60	49.55	3.2	17.14	63.17	3.3	52.05	8.82	3.3	47.29	28.02	3.4	57.63	44
4.2	28.44	49.35	4.2	16.72	63.08	4.3	50.52	8.83	4.3	47.13	28.20	4.4	57.47	44
5.2	28.29	49.16	5.2	16.31	62.99	5.3	49.06	8.85	5.3	46.97	28.38	5.4	57.31	44
6.2	28.14	48.98	6.2	15.92	62.90	6.3	47.66	8.87	6.3	46.82	28.55	6.4	57.16	45
7.2	28.00	48.82	7.2	15.54	62.84	7.3	46.31	8.90	7.3	46.68	28.73	7.4	57.03	45
8.2	27.84	48.68	8.2	15.15	62.79	8.2	44.97	8.95	8.3	46.55	28.93	8.4	56.93	45
9.2	27.69	48.54	9.2	14.74	62.75	9.2	43.59	9.02	9.3	46.41	29.14	9.4	56.85	46
10.2	27.53	48.41	10.2	14.32	62.73	10.2	42.17	9.11	10.3	46.27	29.37	10.4	56.77	46
11.2	27.35	48.27	11.2	13.88	62.70	11.2	40.65	9.19	11.3	46.12	29.61	11.4	56.67	47
12.1	27.17	48.10	12.2	13.42	62.65	12.2	39.03	9.26	12.3	45.96	29.85	12.4	56.55	47
13.1	26.98	47.90	13.2	12.94	62.58	13.2	37.34	9.31	13.3	45.78	30.08	13.4	56.39	47
14.1	26.80	47.68	14.2	12.46	62.48	14.2	35.63	9.32	14.3	45.60	30.29	14.4	56.19	48
15.1	26.62	47.44	15.2	12.00	62.35	15.2	33.93	9.31	15.3	45.41	30.46	15.4	55.96	48
16.1	26.47	47.18	16.2	11.56	62.19	16.2	32.29	9.27	16.3	45.23	30.60	16.4	55.72	49
17.1	26.33	46.91	17.2	11.15	62.02	17.2	30.74	9.22	17.3	45.05	30.72	17.4	55.47	49
18.1	26.19	46.66	18.2	10.77	61.86	18.2	29.29	9.16	18.3	44.88	30.83	18.4	55.24	49
19.1	26.07	46.42	19.2	10.40	61.72	19.2	27.91	9.11	19.3	44.72	30.94	19.4	55.02	50
20.1	25.94	46.21	20.2	10.04	61.59	20.2	26.58	9.08	20.3	44.57	31.06	20.4	54.83	50
21.1	25.80	46.01	21.2	9.69	61.48	21.2	25.26	9.07	21.3	44.42	31.19	21.4	54.66	50
22.1	25.67	45.82	22.2	9.32	61.38	22.2	23.92	9.07	22.3	44.28	31.33	22.4	54.50	50
23.1	25.54	45.63	23.2	8.94	61.28	23.2	22.53	9.07	23.3	44.13	31.49	23.4	54.33	51
24.1	25.39	45.43	24.2	8.54	61.17	24.2	21.09	9.07	24.3	43.97	31.65	24.4	54.16	51
25.1	25.24	45.21	25.2	8.13	61.06	25.2	19.58	9.07	25.3	43.80	31.81	25.4	53.98	51
26.1	25.08	44.97	26.2	7.71	60.93	26.2	18.04	9.05	26.3	43.63	31.95	26.4	53.76	52
27.1	24.93	44.72	27.2	7.29	60.77	27.2	16.47	9.01	27.3	43.45	32.08	27.4	53.52	52
28.1	24.79	44.44	28.1	6.88	60.60	28.2	14.88	8.95	28.3	43.27	32.19	28.4	53.26	53
29.1	24.65	44.15	29.1	6.47	60.41	29.2	13.31	8.87	29.3	43.08	32.29	29.4	52.97	53
30.1	24.52	43.84	30.1	6.08	60.20	30.2	11.77	8.77	30.3	42.89	32.37	30.4	52.67	53
31.1	24.39	43.53	31.1	5.71	59.98	31.2	10.28	8.65	31.3	42.71	32.42	31.4	52.37	53
	7.35	+7.28		16.95	+16.92		58.42	+58.42		7.39	+7.32		18.18	+18.15
	16^{h} 54^{m}	$37^{s}.997$		17^{h} 59^{m}	$40^{s}.30$		19^{h} 5^{m}	$3^{s}.27$		20^{h} 48^{m}	$48^{s}.820$		23^{h} 27^{m}	$44^{s}.65$
	+82° 10′	44″.05		+86° 36′	51″.19		+89° 0′	51″.13		+82° 13′	2″.89		+86° 50′	19″.16

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
n ar te.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
v.	16 54	+82 10	Nov.	17 58	+86 36	Nov.	19 2	+89 1	Nov.	20 48	+82 13	Nov.	23 27	+86 50
	s	″		s	″		s	″		s	″		s	″
.1	24.39	43.53	0.1	65.71	59.98	0.2	70.28	8.65	0.3	42.71	32.42	0.4	52.37	53.97
.1	24.28	43.22	1.1	65.35	59.76	1.2	68.86	8.53	1.3	42.52	32.46	1.4	52.07	54.25
.1	24.17	42.92	2.1	65.02	59.55	2.2	67.51	8.41	2.3	42.35	32.50	2.4	51.78	54.51
.1	24.07	42.64	3.1	64.70	59.34	3.2	66.22	8.30	3.3	42.18	32.53	3.4	51.50	54.76
.1	23.97	42.38	4.1	64.39	59.15	4.2	64.96	8.20	4.2	42.02	32.57	4.4	51.25	55.01
.1	23.86	42.13	5.1	64.06	58.98	5.2	63.70	8.12	5.2	41.87	32.64	5.4	51.01	55.27
.1	23.75	41.89	6.1	63.72	58.83	6.2	62.40	8.06	6.2	41.72	32.73	6.4	50.79	55.55
.1	23.63	41.64	7.1	63.37	58.67	7.2	61.02	8.00	7.2	41.56	32.82	7.4	50.56	55.85
.1	23.50	41.38	8.1	63.00	58.50	8.2	59.56	7.94	8.2	41.40	32.92	8.3	50.32	56.17
.1	23.37	41.09	9.1	62.60	58.31	9.2	58.04	7.86	9.2	41.22	33.01	9.3	50.04	56.49
.1	23.23	40.78	10.1	62.20	58.09	10.2	56.47	7.75	10.2	41.03	33.08	10.3	49.72	56.81
.1	23.11	40.43	11.1	61.81	57.84	11.2	54.91	7.61	11.2	40.82	33.12	11.3	49.37	57.12
.1	23.00	40.07	12.1	61.45	57.57	12.2	53.40	7.43	12.2	40.62	33.12	12.3	49.00	57.40
.1	22.90	39.71	13.1	61.12	57.29	13.1	51.99	7.24	13.2	40.43	33.10	13.3	48.62	57.64
.1	22.83	39.35	14.1	60.82	57.00	14.1	50.68	7.04	14.2	40.26	33.06	14.3	48.25	57.86
5.1	22.76	39.01	15.1	60.55	56.72	15.1	49.47	6.86	15.2	40.09	33.01	15.3	47.90	58.06
6.1	22.69	38.69	16.1	60.29	56.47	16.1	48.33	6.68	16.2	39.92	32.98	16.3	47.58	58.26
7.0	22.62	38.39	17.1	60.04	56.23	17.1	47.23	6.52	17.2	39.77	32.95	17.3	47.27	58.45
8.0	22.55	38.11	18.1	59.78	56.01	18.1	46.12	6.38	18.2	39.63	32.94	18.3	46.99	58.65
9.0	22.48	37.83	19.1	59.52	55.79	19.1	44.99	6.24	19.2	39.48	32.94	19.3	46.72	58.86
0.0	22.39	37.54	20.1	59.24	55.57	20.1	43.81	6.11	20.2	39.32	32.93	20.3	46.43	59.08
1.0	22.30	37.24	21.1	58.95	55.35	21.1	42.59	5.97	21.2	39.16	32.94	21.3	46.13	59.31
2.0	22.22	36.93	22.1	58.64	55.11	22.1	41.32	5.82	22.2	38.99	32.93	22.3	45.81	59.55
3.0	22.14	36.59	23.1	58.34	54.85	23.1	40.02	5.65	23.2	38.81	32.92	23.3	45.46	59.78
4.0	22.05	36.24	24.1	58.05	54.57	24.1	38.72	5.46	24.2	38.63	32.89	24.3	45.09	60.00
5.0	21.98	35.87	25.1	57.76	54.27	25.1	37.44	5.25	25.2	38.45	32.83	25.3	44.71	60.21
6.0	21.92	35.51	26.1	57.49	53.96	26.1	36.20	5.02	26.2	38.27	32.75	26.3	44.32	60.40
7.0	21.86	35.13	27.1	57.24	53.63	27.1	35.00	4.77	27.2	38.09	32.65	27.3	43.91	60.58
28.0	21.82	34.75	28.1	57.01	53.30	28.1	33.88	4.52	28.2	37.92	32.54	28.3	43.50	60.73
29.0	21.79	34.37	29.1	56.81	52.97	29.1	32.83	4.26	29.2	37.76	32.42	29.3	43.09	60.86
30.0	21.76	34.01	30.1	56.63	52.66	30.1	31.87	4.01	30.2	37.61	32.30	30.3	42.71	60.98
31.0	21.73	33.67	31.1	56.45	52.37	31.1	30.96	3.78	31.2	37.47	32.18	31.3	42.35	61.10
	7.35	+7.28		16.94	+16.91		58.38	+58.37		7.39	+7.33		18.19	+18.17
	16^{h} 54^{m}	$37^{s}.997$		17^{h} 59^{m}	$40^{s}.30$		19^{h} 5^{m}	$3^{s}.27$		20^{h} 48^{m}	$48^{s}.820$		23^{h} 27^{m}	$44^{s}.653$
	+82° 10′	44″.05		+86° 36′	51″.19		+89° 0′	51″.13		+82° 13′	2″.89		+86° 50′	19″.16

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Ceph** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	D
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Dec.	16 54	+82 10	Dec.	17 58	+86 36	Dec.	19 2	+89 0	Dec.	20 48	+82 13	Dec.	23 27	+8
	s	″		s	″		s	″		s	″		s	″
1.0	21.73	33.67	1.1	56.45	52.37	1.1	30.96	63.78	1.2	37.47	32.18	1.3	42.35	1.
2.0	21.70	33.35	2.1	56.27	52.10	2.1	30.07	63.56	2.2	37.33	32.08	2.3	42.02	1.
3.0	21.67	33.05	3.1	56.09	51.84	3.1	29.15	63.36	3.2	37.19	31.99	3.3	41.71	1.
4.0	21.62	32.75	4.0	55.89	51.59	4.1	28.20	63.18	4.2	37.04	31.92	4.3	41.39	1.
5.0	21.57	32.43	5.0	55.67	51.33	5.1	27.18	62.99	5.2	36.90	31.86	5.3	41.06	1.
5.9	21.51	32.09	6.0	55.43	51.05	6.1	26.07	62.79	6.2	36.75	31.80	6.3	40.71	1.
6.9	21.45	31.74	7.0	55.18	50.75	7.1	24.91	62.57	7.2	36.58	31.72	7.3	40.33	2.
7.9	21.41	31.36	8.0	54.94	50.42	8.1	23.76	62.32	8.2	36.40	31.61	8.3	39.92	2.
8.9	21.38	30.95	9.0	54.73	50.07	9.1	22.64	62.04	9.2	36.23	31.47	9.3	39.47	2.
9.9	21.35	30.54	10.0	54.54	49.70	10.1	21.62	61.74	10.1	36.05	31.31	10.3	39.02	2.
10.9	21.34	30.13	11.0	54.39	49.33	11.1	20.70	61.43	11.1	35.89	31.12	11.3	38.57	2.
11.9	21.35	29.75	12.0	54.27	48.97	12.1	19.90	61.13	12.1	35.75	30.92	12.3	38.14	2.
12.9	21.36	29.38	13.0	54.17	48.63	13.1	19.20	60.83	13.1	35.62	30.72	13.3	37.74	2.60
13.9	21.37	29.03	14.0	54.08	48.31	14.1	18.56	60.55	14.1	35.49	30.52	14.2	37.36	2.65
14.9	21.39	28.71	15.0	54.00	48.01	15.1	17.94	60.29	15.1	35.38	30.35	15.2	37.02	2.6
15.9	21.39	28.39	16.0	53.91	47.72	16.1	17.31	60.04	16.1	35.26	30.19	16.2	36.68	2.7
16.9	21.40	28.08	17.0	53.81	47.43	17.1	16.65	59.80	17.1	35.14	30.03	17.2	36.34	2.80
17.9	21.40	27.76	18.0	53.70	47.14	18.1	15.96	59.56	18.1	35.02	29.88	18.2	36.00	2.86
18.9	21.39	27.43	19.0	53.58	46.84	19.1	15.22	59.31	19.1	34.89	29.72	19.2	35.64	2.94
19.9	21.39	27.09	20.0	53.46	46.53	20.0	14.46	59.04	20.1	34.76	29.56	20.2	35.26	3.0
20.9	21.39	26.73	21.0	53.33	46.19	21.0	13.69	58.76	21.1	34.62	29.38	21.2	34.85	3.07
21.9	21.40	26.36	21.9	53.22	45.84	22.0	12.93	58.45	22.1	34.48	29.18	22.2	34.43	3.1
22.9	21.41	25.98	22.9	53.12	45.49	23.0	12.22	58.13	23.1	34.34	28.96	23.2	34.00	3.15
23.9	21.43	25.59	23.9	53.05	45.12	24.0	11.56	57.79	24.1	34.21	28.72	24.2	33.56	3.16
24.9	21.47	25.20	24.9	53.00	44.74	25.0	10.96	57.45	25.1	34.08	28.47	25.2	33.11	3.16
25.9	21.51	24.82	25.9	52.97	44.36	26.0	10.47	57.11	26.1	33.96	28.21	26.2	32.68	3.13
26.9	21.57	24.46	26.9	52.97	43.99	27.0	10.05	56.77	27.1	33.85	27.93	27.2	32.27	3.08
27.9	21.63	24.12	27.9	52.98	43.65	28.0	9.71	56.44	28.1	33.75	27.67	28.2	31.88	3.02
28.9	21.69	23.81	28.9	53.00	43.33	29.0	9.41	56.13	29.1	33.66	27.42	29.2	31.52	2.97
29.9	21.74	23.51	29.9	53.01	43.03	30.0	9.11	55.85	30.1	33.57	27.18	30.2	31.18	2.93
30.9	21.78	23.21	30.9	53.01	42.74	31.0	8.79	55.58	31.1	33.48	26.97	31.2	30.85	2.90
31.9	21.82	22.92	31.9	53.00	42.45	32.0	8.39	55.32	32.1	33.40	26.77	32.2	30.52	2.88
7.34		+7.27	16.93		+16.90	58.28		+58.27	7.39		+7.32	18.20		+18.18
16h 54m		37s.997	17h 59m		40s.30	19h 5m		3s.27	20h 48m		48s.820	23h 27m		44s.653
+82° 10′		44″.05	+86° 36′		51″.19	+89° 0′		51″.13	+82° 13′		2″.89	+86° 50′		19″.16

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**38 Piscium.** Mag. 4.7				**α Andromedæ.** (*Alpheratz.*) Mag. 2.2				**β Cassiopeiæ.** Mag. 2.4				**ε Phœnicis.** Mag. 3.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	0 0		− 6 10		0 3		+28 37		0 4		+58 40		0 5		−46 12	
	s		″		s		″		s		″		s		″	
an. 0.2	59.52	10	58.9	5	59.53	13	28.5	9	37.47	30	71.9	7	6.79	19	71.2	4
10.2	59.42	9	59.4	4	59.40	12	27.6	11	37.17	29	71.2	12	6.60	18	70.8	9
20.2	59.33	8	59.8	3	59.28	11	26.5	13	36.88	26	70.0	16	6.42	16	69.9	13
30.1	59.25	7	60.1	2	59.17	10	25.2	15	36.62	23	68.4	21	6.26	12	68.6	17
eb. 9.1	59.18	4	60.3	1	59.07	6	23.7	16	36.39	18	66.3	24	6.14	10	66.9	20
19.1	59.14	2	60.2	2	59.01	4	22.1	16	36.21	12	63.9	25	6.04	6	64.9	24
ar. 1.1	59.12	1	60.0	5	58.97	0	20.5	15	36.09	5	61.4	27	5.98	1	62.5	27
11.0	59.13	5	59.5	7	58.97	4	19.0	14	36.04	3	58.7	27	5.97	3	59.8	29
21.0	59.18	8	58.8	9	59.01	9	17.6	11	36.07	10	56.0	25	6.00	8	56.9	30
31.0	59.26	13	57.9	12	59.10	13	16.5	9	36.17	19	53.5	23	6.08	13	53.9	32
Apr. 10.0	59.39	16	56.7	14	59.23	18	15.6	6	36.36	26	51.2	19	6.21	18	50.7	31
19.9	59.55	20	55.3	16	59.41	22	15.0	1	36.62	33	49.3	15	6.39	23	47.6	32
29.9	59.75	23	53.7	18	59.63	26	14.9	2	36.95	39	47.8	11	6.62	28	44.4	31
May 9.9	59.98	27	51.9	20	59.89	30	15.1	6	37.34	45	46.7	6	6.90	32	41.3	29
19.8	60.25	29	49.9	20	60.19	32	15.7	10	37.79	48	46.1	1	7.22	36	38.4	26
29.8	60.54	31	47.9	22	60.51	35	16.7	13	38.27	51	46.0	5	7.58	38	35.8	24
June 8.8	60.85	32	45.7	21	60.86	35	18.0	17	38.78	53	46.5	10	7.96	41	33.4	21
18.8	61.17	32	43.6	21	61.21	35	19.7	19	39.31	52	47.5	15	8.37	41	31.3	16
28.7	61.49	32	41.5	20	61.56	35	21.6	22	39.83	51	49.0	19	8.78	41	29.7	12
July 8.7	61.81	30	39.5	18	61.91	33	23.8	24	40.34	48	50.9	23	9.19	39	28.5	8
18.7	62.11	29	37.7	16	62.24	30	26.2	25	40.82	44	53.2	27	9.58	37	27.7	2
28.7	62.40	25	36.1	14	62.54	28	28.7	25	41.26	40	55.9	30	9.95	34	27.5	2
Aug. 7.6	62.65	23	34.7	12	62.82	24	31.2	26	41.66	34	58.9	32	10.29	30	27.7	6
17.6	62.88	19	33.5	9	63.06	20	33.8	25	42.00	29	62.1	34	10.59	24	28.3	11
27.6	63.07	15	32.6	6	63.26	16	36.3	24	42.29	22	65.5	34	10.83	19	29.4	15
Sept. 6.5	63.22	11	32.0	4	63.42	12	38.7	23	42.51	16	68.9	35	11.02	14	30.9	18
16.5	63.33	7	31.6	1	63.54	8	41.0	22	42.67	9	72.4	34	11.16	8	32.7	21
26.5	63.40	3	31.5	2	63.62	4	43.2	19	42.76	4	75.8	33	11.24	2	34.8	22
Oct. 6.5	63.43	1	31.7	3	63.66	0	45.1	17	42.80	3	79.1	31	11.26	3	37.0	23
16.4	63.44	3	32.0	5	63.66	2	46.8	14	42.77	8	82.2	28	11.23	8	39.3	23
26.4	63.41	5	32.5	6	63.64	5	48.2	11	42.69	14	85.0	26	11.15	12	41.6	21
Nov. 5.4	63.36	7	33.1	7	63.59	8	49.3	9	42.55	18	87.6	21	11.03	15	43.7	19
15.4	63.29	9	33.8	7	63.51	10	50.2	5	42.37	22	89.7	17	10.88	18	45.6	16
25.3	63.20	9	34.5	8	63.41	11	50.7	3	42.15	25	91.4	13	10.70	19	47.2	13
Dec. 5.3	63.11	10	35.3	7	63.30	12	51.0	1	41.90	28	92.7	7	10.51	21	48.5	8
15.3	63.01	11	36.0	7	63.18	13	50.9	4	41.62	29	93.4	2	10.30	21	49.3	4
25.2	62.90	10	36.7	6	63.05	13	50.5	7	41.33	30	93.6	3	10.09	20	49.7	1
35.2	62.80		37.3		62.92		49.8		41.03		93.3		9.89		49.6	
Sec δ, Tan δ	1.006		−0.108		1.139		+0.546		1.924		+1.644		1.445		−1.043	
Mean Place	$59^s.112$		59″.04		$59^s.450$		16″.23		$38^s.056$		51″.55		$5^s.987$		59″.41	
$D'_\psi\alpha$, $D_\omega\alpha$	0.00		+0.01		0.00		−0.04		0.00		−0.11		0.00		+0.07	
$D_\psi\delta$, $D_\omega\delta$	+0.4		0.0		+0.4		0.0		+0.4		0.0		+0.4		0.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	22 Andromedæ. Mag. 5.1				γ Pegasi. Mag. 2.9				σ Andromedæ. Mag. 4.5				ι Ceti. Mag. 3.8		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declina- tion S.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	0 5		+45 35		0 8		+14 42		0 13		+36 18		0 15		− 9 1
	s		″		s		″		s		″		s		″
Jan. 0.2	53.71	19	74.7	8	51.69	11	47.6	8	53.05	16	65.4	8	6.36	11	42.6
10.2	53.52	19	73.9	12	51.58	10	46.8	9	52.89	15	64.6	11	6.25	10	43.2
20.2	53.33	17	72.7	16	51.48	9	45.9	10	52.74	13	63.5	14	6.15	9	43.5
30.2	53.16	14	71.1	19	51.39	8	44.9	10	52.61	12	62.1	16	6.06	7	43.7
Feb. 9.1	53.02	11	69.2	21	51.31	6	43.9	10	52.49	9	60.5	18	5.99	5	43.7
19.1	52.91	7	67.1	22	51.25	3	42.9	9	52.40	6	58.7	19	5.94	3	43.5
Mar. 1.1	52.84	2	64.9	22	51.22	0	42.0	7	52.34	2	56.8	18	5.91	1	43.1
11.0	52.82	3	62.7	22	51.22	4	41.3	6	52.32	2	55.0	17	5.90	3	42.4
21.0	52.85	9	60.5	20	51.26	8	40.7	3	52.34	8	53.3	16	5.93	7	41.6
31.0	52.94	15	58.5	17	51.34	12	40.4	1	52.42	13	51.7	13	6.00	11	40.5
Apr. 10.0	53.09	20	56.8	14	51.46	16	40.3	2	52.55	18	50.4	10	6.11	14	39.1
19.9	53.29	27	55.4	10	51.62	20	40.5	5	52.73	23	49.4	6	6.25	19	37.5
29.9	53.56	31	54.4	6	51.82	24	41.0	9	52.96	27	48.8	2	6.44	22	35.8
May 9.9	53.87	35	53.8	1	52.06	27	41.9	11	53.23	31	48.6	2	6.66	26	33.9
19.8	54.22	38	53.7	4	52.33	30	43.0	14	53.54	34	48.8	7	6.92	28	31.8
29.8	54.60	40	54.1	8	52.63	32	44.4	17	53.88	36	49.5	10	7.20	31	29.6
June 8.8	55.00	42	54.9	13	52.95	33	46.1	19	54.24	37	50.5	14	7.51	32	27.5
18.8	55.42	41	56.2	17	53.28	33	48.0	21	54.61	38	51.9	18	7.83	32	25.3
28.7	55.83	41	57.9	21	53.61	32	50.1	21	54.99	37	53.7	21	8.15	32	23.2
July 8.7	56.24	38	60.0	24	53.93	31	52.2	22	55.36	35	55.8	23	8.47	31	21.2
18.7	56.62	36	62.4	27	54.24	29	54.4	22	55.71	33	58.1	26	8.78	30	19.5
28.7	56.98	32	65.1	29	54.53	27	56.6	22	56.04	30	60.7	26	9.08	26	17.9
Aug. 7.6	57.30	28	68.0	30	54.80	23	58.8	21	56.34	26	63.3	28	9.34	24	16.6
17.6	57.58	23	71.0	30	55.03	19	60.9	19	56.60	23	66.1	27	9.58	20	15.5
27.6	57.81	19	74.0	31	55.22	16	62.8	17	56.83	18	68.8	28	9.78	16	14.8
Sept. 6.5	58.00	13	77.1	31	55.38	12	64.5	16	57.01	13	71.6	26	9.94	13	14.3
16.5	58.13	9	80.2	29	55.50	8	66.1	13	57.14	10	74.2	25	10.07	8	14.1
26.5	58.22	4	83.1	28	55.58	5	67.4	12	57.24	5	76.7	23	10.15	5	14.2
Oct. 6.5	58.26	0	85.9	25	55.63	1	68.6	0	57.29	1	79.0	21	10.20	2	14.6
16.4	58.26	5	88.4	23	55.64	1	69.5	6	57.30	2	81.1	19	10.22	2	15.1
26.4	58.21	8	90.7	20	55.63	4	70.1	5	57.28	5	83.0	16	10.20	4	15.8
Nov. 5.4	58.13	11	92.7	17	55.59	6	70.6	2	57.23	8	84.6	12	10.16	6	16.6
15.4	58.02	14	94.4	12	55.53	8	70.8	0	57.15	10	85.8	10	10.10	8	17.4
25.3	57.88	16	95.6	8	55.45	10	70.8	2	57.05	12	86.8	5	10.02	9	18.3
Dec. 5.3	57.72	18	96.4	4	55.35	10	70.6	4	56.93	14	87.3	2	9.93	10	19.2
15.3	57.54	19	96.8	1	55.25	11	70.2	5	56.79	15	87.5	2	9.83	11	20.0
25.2	57.35	20	96.7	5	55.14	11	69.7	8	56.64	15	87.3	6	9.72	10	20.7
35.2	57.15		96.2		55.03		68.9		56.49		86.7		9.62		21.3
Sec δ, Tan δ	1.429		+1.021		1.034		+0.263		1.241		+0.735		1.013		−0.164
Mean Place	53ˢ.898		57″.38		51ˢ.420		39″.81		52ˢ.995		50″.41		5ˢ.845		42″.12
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		−0.07		0.00		−0.02		0.00		−0.05		0.00		+0.01
$D_\psi \delta$, $D_\omega \delta$	+0.4		0.0		+0.4		0.0		+0.4		+0.1		+0.4		+0.1

an Solar Date.	**ζ Tucanæ.** Mag. 4.3				**44 Piscium.** Mag. 6.0				**β Hydri.** Mag. 2.9				**α Phœnicis.** Mag. 2.4			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	0 15		−65 21		0 21		+ 1 28		0 21		−77 43		0 22		−42 45	
	s		″		s		″		s		″		s		″	
n. 0.2	40.50	40	101.3	9	3.15	11	11.7	6	20.53	90	74.6	11	6.05	18	73.8	1
10.2	40.10	37	100.4	14	3.04	10	11.1	6	19.63	84	73.5	16	5.87	17	73.7	6
20.2	39.73	34	99.0	19	2.94	9	10.5	5	18.79	77	71.9	22	5.70	16	73.1	10
30.2	39.39	28	97.1	24	2.85	7	10.0	5	18.02	66	69.7	27	5.54	14	72.1	14
b. 9.1	39.11	23	94.7	28	2.78	6	9.5	3	17.36	55	67.0	31	5.40	10	70.7	18
19.1	38.88	16	91.9	31	2.72	4	9.2	2	16.81	42	63.9	34	5.30	8	68.9	22
ar. 1.1	38.72	10	88.8	34	2.68	1	9.0	0	16.39	27	60.5	37	5.22	3	66.7	24
11.0	38.62	1	85.4	36	2.67	3	9.0	2	16.12	12	56.8	38	5.19	0	64.3	27
21.0	38.61	6	81.8	37	2.70	6	9.2	4	16.00	4	53.0	39	5.19	6	61.6	29
31.0	38.67	15	78.1	38	2.76	10	9.6	7	16.04	19	49.1	39	5.25	10	58.7	30
pr. 10.0	38.82	22	74.3	37	2.86	15	10.3	10	16.23	34	45.2	38	5 35	15	55.7	31
19.9	39.04	31	70.6	35	3.01	18	11.3	12	16.57	50	41.4	36	5.50	21	52.6	32
29.9	39.35	38	67.1	34	3.19	22	12.5	15	17.07	63	37.8	34	5.71	25	49.4	30
ay 9.9	39.73	45	63.7	31	3.41	26	14.0	16	17.70	76	34.4	30	5.96	29	46.4	30
19.9	40.18	51	60.6	28	3.67	28	15.6	18	18.46	88	31.4	27	6.25	33	43.4	28
29.8	40.69	55	57.8	24	3.95	30	17.4	20	19.34	97	28.7	23	6.58	36	40.6	25
une 8.8	41.24	59	55.4	19	4.25	32	19.4	21	20.31	103	26.4	17	6.94	38	38.1	22
18.8	41.83	61	53.5	15	4.57	32	21.5	21	21.34	107	24.7	12	7.32	39	35.9	19
28.7	42.44	61	52.0	9	4.89	32	23.6	20	22.41	109	23.5	7	7.71	39	34.0	14
uly 8.7	43.05	59	51.1	3	5.21	31	25.6	20	23.50	107	22.8	1	8.10	38	32.6	10
18.7	43.64	57	50.8	2	5.52	29	27.6	19	24.57	102	22.7	5	8.48	36	31.6	5
28.7	44.21	52	51.0	7	5.81	27	29.5	17	25.59	95	23.2	11	8.84	34	31.1	1
ug. 7.6	44.73	46	51.7	13	6.08	23	31.2	15	26.54	84	24.3	16	9.18	30	31.0	4
17.6	45.19	38	53.0	17	6.31	21	32.7	13	27.38	70	25.9	20	9.48	25	31.4	9
27.6	45.57	30	54.7	21	6.52	16	34.0	11	28.08	55	27.9	25	9.73	21	32.3	13
ept. 6.6	45.87	21	56.8	25	6.68	13	35.1	8	28.63	38	30.4	27	9.94	15	33.6	16
16.5	46.08	12	59.3	27	6.81	10	35.9	5	29.01	19	33.1	29	10.09	10	35.2	19
26.5	46.20	2	62.0	28	6.91	5	36.4	3	29.20	0	36.0	31	10.19	4	37.1	21
ct. 6.5	46.22	7	64.8	28	6.96	3	36.7	1	29.20	18	39.1	30	10.23	0	39.2	22
16.4	46.15	16	67.6	27	6.99	1	36.8	1	29.02	37	42.1	28	10.23	5	41.4	23
26.4	45.99	24	70.3	25	6.98	3	36.7	2	28.65	52	44.9	26	10.18	9	43.7	21
Nov. 5.4	45.75	30	72.8	21	6.95	5	36.5	4	28.13	67	47.5	22	10.09	12	45.8	20
15.4	45.45	36	74.9	18	6.90	7	36.1	5	27.46	79	49.7	17	9.97	15	47.8	17
25.3	45.09	39	76.7	12	6.83	8	35.6	6	26.67	87	51.4	12	9.82	17	49.5	15
Dec. 5.3	44.70	41	77.9	7	6.75	9	35.0	7	25.80	92	52.6	6	9.65	18	51.0	10
15.3	44.29	42	78.6	1	6.66	10	34.3	6	24.88	94	53.2	1	9.47	19	52.0	6
25.3	43.87	41	78.7	5	6.56	11	33.7	7	23.94	93	53.1	7	9.28	19	52.6	2
35.2	43.46		78.2		6.45		33.0		23.01		52.4		9.09		52.8	
ec δ, Tan δ	2.400		−2.181		1.000		+0.026		4.706		−4.598		1.362		−0.925	
ean Place	39ˢ.189		86″.29		2ˢ.687		8″.31		28ˢ.226		58″.65		5ˢ.172		63″.30	
D′ψ α, Dω α	0.00		+0.15		0.00		0.00		−0.01		+0.31		0.00		+0.06	
Dψ δ, Dω δ	+0.4		+0.1		+0.4		+0.1		+0.4		+0.1		+0.4		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	12 Ceti. Mag. 6.0				13 Ceti. Mag. 5.2				ζ Cassiopeiæ. Mag. 3.7				π Andromedæ. Mag. 4.4		
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Dec tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	0 25		− 4 25		0 30		− 4 3		0 32		+53 25		0 32		+33
	s		″		s		″		s		″		s		″
Jan. 0.2	42.60		35.0		52.90		36.3		13.65		65.6		20.46		20.4
10.2	42.50	10	35.6	6	52.80	10	36.9	6	13.40	25	65.2	4	20.32	14	19.8
20.2	42.40	10	36.1	5	52.70	10	37.4	5	13.16	24	64.3	9	20.18	14	18.8
30.2	42.31	9	36.4	3	52.60	10	37.7	3	12.92	24	62.9	14	20.04	14	17.6
Feb. 9.1	42.23	8	36.6	2	52.52	8	38.0	3	12.71	21	61.2	17	19.92	12	16.2
19.1	42.16	7	36.7	1	52.45	7	38.0	0	12.53	18	59.1	21	19.82	10	14.6
Mar. 1.1	42.12	4	36.6	1	52.41	4	37.9	1	12.40	13	56.8	23	19.74	8	13.0
11.1	42.11	1	36.2	4	52.39	2	37.6	3	12.32	8	54.4	24	19.71	3	11.3
21.0	42.13	2	35.6	6	52.41	2	37.1	5	12.31	1	52.0	24	19.72	1	9.7
31.0	42.19	6	34.8	8	52.46	5	36.3	8	12.37	6	49.6	24	19.77	5	8.3
Apr. 10.0	42.29	10	33.8	10	52.55	9	35.2	11	12.49	12	47.5	21	19.88	11	7.1
19.9	42.42	13	32.5	13	52.69	14	34.0	12	12.68	19	45.6	19	20.03	15	6.3
29.9	42.60	18	31.0	15	52.86	17	32.5	15	12.95	27	44.1	15	20.23	20	5.7
May 9.9	42.82	22	29.3	17	53.07	21	30.8	17	13.27	32	43.0	11	20.48	25	5.5
19.9	43.07	25	27.4	19	53.32	25	28.9	19	13.64	37	42.3	7	20.77	29	5.8
29.8	43.35	28	25.4	20	53.59	27	26.9	20	14.06	42	42.2	1	21.09	32	6.4
June 8.8	43.65	30	23.3	21	53.89	30	24.8	21	14.51	45	42.5	3	21.44	35	7.4
18.8	43.96	31	21.1	22	54.21	32	22.7	21	14.98	47	43.3	8	21.80	36	8.7
28.8	44.28	32	19.0	21	54.53	32	20.6	21	15.46	48	44.6	13	22.17	37	10.4
July 8.7	44.60	32	17.0	20	54.85	32	18.6	20	15.93	47	46.3	17	22.54	37	12.4
18.7	44.91	31	15.1	19	55.17	32	16.7	19	16.38	45	48.4	21	22.89	35	14.6
28.7	45.21	30	13.4	17	55.46	29	14.9	18	16.80	42	50.8	24	23.22	33	17.0
Aug. 7.6	45 48	27	11.9	15	55.74	28	13.4	15	17.19	39	53.5	27	23.53	31	19.4
17.6	45.72	24	10.6	13	55.98	24	12.1	13	17.54	35	56.5	30	23.81	28	22.0
27.6	45.92	20	9.6	10	56.19	21	11.1	10	17.84	30	59.6	31	24.04	23	24.6
Sept. 6.6	46.10	18	8.9	7	56.37	18	10.3	8	18.09	25	62.8	32	24.24	20	27.1
16.5	46.23	13	8.4	5	56.51	14	9.8	5	18.29	20	66.0	32	24.40	16	29.6
26.5	46.33	10	8.2	2	56.61	10	9.6	2	18.43	14	69.2	32	24.51	11	31.9
Oct. 6.5	46.39	6	8.3	1	56.68	7	9.7	1	18.51	8	72.3	31	24.59	8	34.1
16.5	46.42	3	8.5	2	56.71	3	9.9	2	18.55	4	75.2	29	24.63	4	36.1
26.4	46.42	0	9.0	5	56.72	1	10.3	4	18.53	2	78.0	28	24.63	0	37.8
Nov. 5.4	46.39	3	9.5	5	56.69	3	10.9	6	18.47	6	80.4	24	24.61	2	39.3
15.4	46.34	5	10.2	7	56.65	4	11.6	7	18.36	11	82.6	22	24.55	6	40.5
25.3	46.27	7	10.9	7	56.58	7	12.3	7	18.22	14	84.3	17	24.47	8	41.3
Dec. 5.3	46.18	9	11.7	8	56.50	8	13.1	8	18.04	18	85.7	14	24.37	10	41.9
15.3	46.09	9	12.5	8	56.41	9	13.8	7	17.83	21	86.5	8	24.25	12	42.1
25.3	45.99	10	13.2	7	56.31	10	14.5	7	17.60	23	86.9	4	24.11	14	42.0
35.2	45.88	11	13.8	6	56.21	10	15.2	7	17.35	25	86.8	1	23.97	14	41.5
Sec δ, Tan δ	1.003		−0.077		1.003		−0.071		1.679		+1.348		1.196		+0.656
Mean Place	$42^s.071$		36″.49		$52^s.341$		38″.03		$13^s.732$		45″.39		$20^s.224$		5″.76
$D'_\psi\alpha$, $D_\omega\alpha$	0.00		+0.01		0.00		0.00		0.00		−0.09		0.00		−0.04
$)_\psi\delta$, $D_\omega\delta$	+0.4		+0.1		+0.4		+0.1		+0.4		+0.1		+0.4		+0.1

ean Solar Date.	ε Andromedæ. Mag. 4.5				δ Andromedæ. Mag. 3.5				α Cassiopeiæ. (*Schedir.*) Var. 2.2–2.8				μ Phœnicis. Mag. 4.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 0 34		° ′ +28 51		h m 0 34		° ′ +30 23		h m 0 35		° ′ +56 4		h m 0 37		° ′ −46 32	
	s		″		s		″		s		″		s		″	
an. 0.2	3.92	13	14.7	7	47.03	13	59.0	7	40.40	28	37.7	3	19.65	21	77.7	1
10.2	3.79	13	14.0	9	46.90	14	58.3	9	40.12	27	37.4	8	19.44	21	77.6	6
20.2	3.66	13	13.1	11	46.76	13	57.4	11	39.85	26	36.6	14	19.23	18	77.0	10
30.2	3.53	11	12.0	13	46.63	12	56.3	14	39.59	23	35.2	17	19.05	17	76.0	15
eb. 9.1	3.42	10	10.7	15	46.51	9	54.9	15	39.36	20	33.5	21	18.88	14	74.5	19
19.1	3.32	7	9.2	15	46.42	7	53.4	15	39.16	15	31.4	23	18.74	11	72.6	22
ar 1.1	3.25	3	7.7	14	46.35	4	51.9	16	39.01	9	29.1	24	18.63	7	70.4	26
11.1	3.22	1	6.3	14	46.31	1	50.3	14	38.92	3	26.7	25	18.56	2	67.8	28
21.0	3.23	5	4.9	12	46.32	5	48.9	12	38.89	5	24.2	25	18.54	3	65.0	30
31.0	3.28	10	3.7	9	46.37	10	47.7	11	38.94	13	21.7	22	18.57	8	62.0	32
pr. 10.0	3.38	15	2.8	7	46.47	15	46.6	7	39.07	20	19.5	20	18.65	13	58.8	33
19.9	3.53	19	2.1	3	46.62	20	45.9	4	39.27	27	17.5	17	18.78	19	55.5	33
29.9	3.72	24	1.8	0	46.82	24	45.5	1	39.54	33	15.8	12	18.97	24	52.2	32
lay 9.9	3.96	28	1.8	4	47.06	28	45.4	4	39.87	39	14.6	8	19.21	28	49.0	31
19.9	4.24	31	2.2	8	47.34	31	45.8	7	40.26	44	13.8	3	19.49	33	45.9	29
29.8	4.55	33	3.0	12	47.65	34	46.5	11	40.70	47	13.5	2	19.82	36	43.0	27
une 8.8	4.88	35	4.2	14	47.99	36	47.6	14	41.17	49	13.7	7	20.18	39	40.3	23
18.8	5.23	36	5.6	17	48.35	36	49.0	17	41.66	50	14.4	12	20.57	40	38.0	20
28.8	5.59	35	7.3	20	48.71	36	50.7	19	42.16	50	15.6	16	20.97	41	36.0	15
uly 8.7	5.94	34	9.3	22	49.07	34	52.6	22	42.66	48	17.2	20	21.38	40	34.5	10
18.7	6.28	33	11.5	23	49.41	33	54.8	24	43.14	45	19.2	24	21.78	39	33.5	6
28.7	6.61	29	13.8	24	49.74	30	57.2	24	43.59	41	21.6	27	22.17	36	32.9	0
ug. 7.6	6.90	27	16.2	25	50.04	27	59.6	25	44.00	38	24.3	29	22.53	32	32.9	4
17.6	7.17	23	18.7	24	50.31	24	62.1	25	44.38	32	27.2	31	22.85	28	33.3	9
27.6	7.40	20	21.1	23	50.55	20	64.6	24	44.70	26	30.3	33	23.13	23	34.2	14
ept. 6.6	7.60	15	23.4	23	50.75	15	67.0	23	44.96	21	33.6	33	23.36	18	35.6	17
16.5	7.75	11	25.7	21	50.90	12	69.3	22	45.17	16	36.9	32	23.54	12	37.3	21
26.5	7.86	8	27.8	19	51.02	8	71.5	20	45.33	9	40.1	32	23.66	6	39.4	22
Oct. 6.5	7.94	4	29.7	17	51.10	4	73.5	18	45.42	4	43.3	31	23.72	1	41.6	24
16.5	7.98	1	31.4	15	51.14	1	75.3	15	45.46	2	46.4	29	23.73	4	44.0	24
26.4	7.99	2	32.9	12	51.15	2	76.8	14	45.44	6	49.3	25	23.69	8	46.4	24
Nov. 5.4	7.97	5	34.1	10	51.13	5	78.2	10	45.38	12	51.8	23	23.61	13	48.8	22
15.4	7.92	7	35.1	7	51.08	8	79.2	8	45.26	16	54.1	19	23.48	16	51.0	19
25.3	7.85	10	35.8	3	51.00	9	80.0	4	45.10	19	56.0	14	23.32	18	52.9	16
Dec. 5.3	7.75	11	36.1	1	50.91	11	80.4	2	44.91	22	57.4	10	23.14	20	54.5	11
15.3	7.64	12	36.2	2	50.80	13	80.6	2	44.69	25	58.4	5	22.94	21	55.6	7
25.3	7.52	13	36.0	5	50.67	13	80.4	5	44.44	27	58.9	0	22.73	21	56.3	3
35.2	7.39		35.5		50.54		79.9		44.17		58.9		22.52		56.6	
ec δ, Tan δ	1.142		+0.551		1.159		+0.587		1.792		+1.487		1.454		−1.056	
lean Place	3ˢ.624		1″.40		46ˢ.744		45″.13		40ˢ.497		16″.87		18ˢ.605		66″.68	
ψ α, Dω α	0.00		−0.04		0.00		−0.04		+0.01		−0.10		0.00		+0.07	
ψ δ, Dω δ	+0.4		+0.1		+0.4		+0.2		+0.4		+0.2		+0.4		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Ceti. Mag. 2.2				ο Cassiopeiæ. Mag. 4.7				21 Cassiopeiæ. Mag. 5.6				ζ Andromedæ. Mag. 4.3		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Decli- tion
	h m 0 39 s		° ′ −18 26 ″		h m 0 39 s		° ′ +47 49 ″		h m 0 39 s		° ′ +74 31 ″		h m 0 42 s		° +23 ″
Jan. 0.3	20.14		73.4		59.07		28.8		59.78		49.4		50.21		29.8
10.2	20.03	11	73.8	4	58.86	21	28.5	3	59.08	70	49.5	1	50.09	12	29.2
20.2	19.91	12	74.0	2	58.65	21	27.6	9	58.39	69	48.9	6	49.96	13	28.4
30.2	19.80	11	73.9	1	58.45	20	26.3	13	57.73	66	47.7	12	49.84	12	27.3
Feb. 9.1	19.70	10	73.6	3	58.27	18	24.7	16	57.12	61	46.1	16	49.73	11	26.2
19.1	19.62	8	73.0	6	58.11	16	22.8	19	56.60	52	43.9	22	49.64	9	25.0
Mar. 1.1	19.57	5	72.1	9	57.99	12	20.7	21	56.20	40	41.4	25	49.57	7	23.7
11.1	19.53	4	71.0	11	57.92	7	18.5	22	55.92	28	38.7	27	49.53	4	22.5
21.0	19.54	1	69.6	14	57.91	1	16.3	22	55.78	14	35.7	30	49.53	0	21.5
31.0	19.58	4	68.0	16	57.95	4	14.2	21	55.80	2	32.8	29	49.58	5	20.6
Apr. 10.0	19.66	8	66.1	19	58.06	11	12.3	19	55.98	18	30.0	28	49.67	9	19.9
20.0	19.78	12	64.1	20	58.23	17	10.6	17	56.31	33	27.3	27	49.80	13	19.5
29.9	19.95	17	61.9	22	58.46	23	9.3	13	56.78	47	25.0	23	49.98	18	19.4
May 9.9	20.15	20	59.5	24	58.75	29	8.4	9	57.38	60	23.1	19	50.21	23	19.7
19.9	20.39	24	57.1	24	59.08	33	7.9	5	58.10	72	21.6	15	50.47	26	20.3
29.8	20.67	28	54.7	24	59.46	38	7.9	0	58.90	80	20.6	10	50.76	29	21.2
June 8.8	20.97	30	52.3	24	59.87	41	8.4	5	59.77	87	20.2	4	51.08	32	22.5
18.8	21.29	32	50.0	23	60.29	42	9.2	8	60.68	91	20.3	1	51.42	34	24.0
28.8	21.62	33	47.9	21	60.73	44	10.5	13	61.60	92	21.0	7	51.76	34	25.8
July 8.7	21.95	33	45.9	20	61.16	43	12.2	17	62.52	92	22.2	12	52.10	34	27.7
18.7	22.27	32	44.3	16	61.58	42	14.3	21	63.42	90	23.9	17	52.44	34	29.9
28.7	22.58	31	42.9	14	61.97	39	16.7	24	64.26	84	26.1	22	52.76	32	32.1
Aug. 7.6	22.87	29	41.8	11	62.34	37	19.3	26	65.03	77	28.7	26	53.05	29	34.3
17.6	23.12	25	41.1	7	62.67	33	22.1	28	65.72	69	31.6	29	53.32	27	36.6
27.6	23.35	23	40.7	4	62.95	28	25.0	29	66.33	61	34.8	32	53.55	23	38.8
Sept. 6.6	23.54	19	40.7	0	63.19	24	28.0	30	66.83	50	38.3	35	53.75	20	40.9
16.5	23.69	15	41.1	4	63.38	19	31.0	30	67.21	38	41.9	36	53.91	16	42.9
26.5	23.80	11	41.7	6	63.53	15	34.0	30	67.48	27	45.6	37	54.03	12	44.7
Oct. 6.5	23.88	8	42.6	9	63.62	9	36.9	29	67.63	15	49.3	37	54.12	9	46.3
16.5	23.91	3	43.7	11	63.67	5	39.6	27	67.66	3	53.0	37	54.17	5	47.8
26.4	23.91	0	44.9	12	63.68	1	42.1	25	67.57	9	56.5	35	54.19	2	49.0
Nov. 5.4	23.89	2	46.2	13	63.64	4	44.3	22	67.37	20	59.8	33	54.18	1	49.9
15.4	23.83	6	47.5	13	63.56	8	46.2	19	67.06	31	62.7	29	54.14	4	50.6
25.4	23.76	7	48.8	13	63.45	11	47.8	16	66.64	42	65.3	26	54.08	6	51.1
Dec. 5.3	23.67	9	50.0	12	63.31	14	49.0	12	66.14	50	67.5	22	54.00	8	51.4
15.3	23.56	11	51.0	10	63.14	17	49.7	7	65.55	59	69.1	16	53.90	10	51.3
25.3	23.45	11	51.8	8	62.96	18	50.0	3	64.91	64	70.1	10	53.79	11	51.1
35.2	23.33	12	52.4	6	62.75	21	49.8	2	64.23	68	70.6	5	53.67	12	50.6
Sec δ, Tan δ	1.054		−0.334		1.490		+1.104		3.749		+3.613		1.093		+0.441
Mean Place	19ˢ.419		70″.44		58ˢ.953		9″.82		60ˢ.695		25″.22		49ˢ.797		17″.90
D′ψ a, Dω a	0.00		+0.02		+0.01		−0.07		+0.02		−0.24		0.00		−0.03
δ, Dω δ	+0.4		+0.2		+0.4		+0.2		+0.4		+0.2		+0.4		+0.2

ean Solar Date.	η Cassiopeiæ. Mag. 3.6				δ Piscium. Mag. 4.6				λ Hydri. Mag. 5.0				20 Ceti. Mag. 4.9			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 0 43		° ′ +57 21		h m 0 44		° ′ + 7 7		h m 0 45		° ′ −75 22		h m 0 48		° ′ − 1 35	
	s		″		s		″		s		″		s		″	
an. 0.3	56.94	28	78.5	2	16.81	11	27.9	7	41.52	79	84.0	7	40.39	10	76.5	6
10.2	56.66	29	78.3	7	16.70	11	27.2	7	40.73	76	83.3	13	40.29	11	77.1	6
20.2	56.37	27	77.6	13	16.59	10	26.5	7	39.97	71	82.0	18	40.18	10	77.7	4
30.2	56.10	25	76.3	16	16.49	9	25.8	6	39.26	64	80.2	23	40.08	10	78.1	4
eb. 9.1	55.85	21	74.7	20	16.40	8	25.2	5	38.62	55	77.9	28	39.98	8	78.5	2
19.1	55.64	17	72.7	23	16.32	6	24.7	5	38.07	45	75.1	32	39.90	6	78.7	0
ar 1.1	55.47	11	70.4	25	16.26	3	24.2	3	37.62	33	71.9	34	39.84	3	78.7	2
11.1	55.36	3	67.9	26	16.23	0	23.9	1	37.29	22	68.5	37	39.81	1	78.5	4
21.0	55.33	3	65.3	25	16.23	4	23.8	1	37.07	9	64.8	38	39.80	4	78.1	6
31.0	55.36	12	62.8	23	16.27	8	23.9	3	36.98	5	61.0	39	39.84	7	77.5	9
pr. 10.0	55.48	19	60.5	21	16.35	13	24.2	6	37.03	19	57.1	38	39.91	12	76.6	11
20.0	55.67	27	58.4	18	16.48	16	24.8	8	37.22	31	53.3	38	40.03	16	75.5	13
29.9	55.94	34	56.6	13	16.64	21	25.6	12	37.53	44	49.5	35	40.19	20	74.2	16
ay 9.9	56.28	40	55.3	9	16.85	24	26.8	14	37.97	56	46.0	33	40.39	23	72.6	17
19.9	56.68	44	54.4	5	17.09	27	28.2	15	38.53	67	42.7	29	40.62	26	70.9	19
29.8	57.12	49	53.9	1	17.36	30	29.7	18	39.20	76	39.8	26	40.88	29	69.0	20
une 8.8	57.61	51	54.0	5	17.66	32	31.5	19	39.96	83	37.2	20	41.17	31	67.0	21
18.8	58.12	52	54.5	11	17.98	32	33.4	20	40.79	88	35.2	16	41.48	32	64.9	21
28.8	58.64	51	55.6	15	18.30	32	35.4	20	41.67	90	33.6	10	41.80	32	62.8	21
uly 8.7	59.15	50	57.1	19	18.62	32	37.4	21	42.57	91	32.6	4	42.12	32	60.7	19
18.7	59.65	48	59.0	22	18.94	30	39.5	20	43.48	88	32.2	1	42.44	30	58.8	18
28.7	60.13	44	61.2	26	19.24	28	41.5	18	44.36	83	32.3	7	42.74	28	57.0	16
ug. 7.7	60.57	40	63.8	29	19.52	26	43.3	17	45.19	76	33.0	13	43.02	26	55.4	14
17.6	60.97	34	66.7	31	19.78	22	45.0	16	45.95	65	34.3	18	43.28	22	54.0	12
27.6	61.31	30	69.8	31	20.00	19	46.6	13	46.60	53	36.1	23	43.50	19	52.8	9
ept. 6.6	61.61	23	72.9	33	20.19	15	47.9	11	47.13	39	38.4	26	43.69	16	51.9	6
16.5	61.84	18	76.2	33	20.34	12	49.0	9	47.52	24	41.0	28	43.85	12	51.3	4
26.5	62.02	11	79.5	32	20.46	8	49.9	6	47.76	9	43.8	30	43.97	8	50.9	1
Oct. 6.5	62.13	6	82.7	31	20.54	5	50.5	4	47.85	8	46.8	31	44.05	5	50.8	2
16.5	62.19	0	85.8	29	20.59	2	50.9	2	47.77	23	49.9	30	44.10	2	51.0	3
26.4	62.19	5	88.7	27	20.61	1	51.1	1	47.54	37	52.9	28	44.12	0	51.3	4
Nov. 5.4	62.14	10	91.4	23	20.60	3	51.2	2	47.17	50	55.7	25	44.12	3	51.7	6
15.4	62.04	15	93.7	20	20.57	5	51.0	3	46.67	61	58.2	20	44.09	5	52.3	7
25.4	61.89	19	95.7	16	20.52	7	50.7	4	46.06	70	60.2	15	44.04	7	53.0	7
Dec. 5.3	61.70	22	97.3	11	20.45	9	50.3	5	45.36	76	61.7	10	43.97	9	53.7	7
15.3	61.48	25	98.4	6	20.36	10	49.8	6	44.60	79	62.7	4	43.88	9	54.4	8
25.3	61.23	28	99.0	0	20.26	10	49.2	6	43.81	80	63.1	3	43.79	11	55.2	6
35.2	60.95		99.0		20.16		48.6		43.01		62.8		43.68		55.8	
ec δ, Tan δ	1.855		+1.562		1.008		+0.125		3.963		−3.834		1.000		−0.028	
ean Place	56ˢ.963		57″.15		16ˢ.251		21″.73		39ˢ.057		68″.87		39ˢ.747		79″.65	
$D'_\psi \alpha$, $D_\omega \alpha$	+0.01		−0.10		0.00		−0.01		−0.02		+0.26		0.00		0.00	
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.2		+0.4		+0.2		+0.4		+0.2		+0.4		+0.2	

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Ce** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	
Oct.	16 54	+82 10	Oct.	17 59	+86 36	Oct.	19 3	+89 1	Oct.	20 48	+82 13	Oct.	23 27	+8
	s	″		s	″		s	″		s	″		s	
0.2	29.13	50.08	0.2	18.51	63.37	0.3	56.83	8.67	0.3	47.79	27.35	0.5	58.07	4
1.2	28.95	49.92	1.2	18.05	63.32	1.3	55.22	8.74	1.3	47.62	27.60	1.5	57.93	4
2.2	28.78	49.75	2.2	17.59	63.25	2.3	53.62	8.79	2.3	47.45	27.82	2.4	57.79	4
3.2	28.60	49.55	3.2	17.14	63.17	3.3	52.05	8.82	3.3	47.29	28.02	3.4	57.63	4
4.2	28.44	49.35	4.2	16.72	63.08	4.3	50.52	8.83	4.3	47.13	28.20	4.4	57.47	44
5.2	28.29	49.16	5.2	16.31	62.99	5.3	49.06	8.85	5.3	46.97	28.38	5.4	57.31	4
6.2	28.14	48.98	6.2	15.92	62.90	6.3	47.66	8.87	6.3	46.82	28.55	6.4	57.16	4
7.2	28.00	48.82	7.2	15.54	62.84	7.3	46.31	8.90	7.3	46.68	28.73	7.4	57.03	45
8.2	27.84	48.68	8.2	15.15	62.79	8.2	44.97	8.95	8.3	46.55	28.93	8.4	56.93	45
9.2	27.69	48.54	9.2	14.74	62.75	9.2	43.59	9.02	9.3	46.41	29.14	9.4	56.85	4
10.2	27.53	48.41	10.2	14.32	62.73	10.2	42.17	9.11	10.3	46.27	29.37	10.4	56.77	4
11.2	27.35	48.27	11.2	13.88	62.70	11.2	40.65	9.19	11.3	46.12	29.61	11.4	56.67	47
12.1	27.17	48.10	12.2	13.42	62.65	12.2	39.03	9.26	12.3	45.96	29.85	12.4	56.55	47
13.1	26.98	47.90	13.2	12.94	62.58	13.2	37.34	9.31	13.3	45.78	30.08	13.4	56.39	47
14.1	26.80	47.68	14.2	12.46	62.48	14.2	35.63	9.32	14.3	45.60	30.29	14.4	56.19	4
15.1	26.62	47.44	15.2	12.00	62.35	15.2	33.93	9.31	15.3	45.41	30.46	15.4	55.96	4
16.1	26.47	47.18	16.2	11.56	62.19	16.2	32.29	9.27	16.3	45.23	30.60	16.4	55.72	49
17.1	26.33	46.91	17.2	11.15	62.02	17.2	30.74	9.22	17.3	45.05	30.72	17.4	55.47	49
18.1	26.19	46.66	18.2	10.77	61.86	18.2	29.29	9.16	18.3	44.88	30.83	18.4	55.24	49
19.1	26.07	46.42	19.2	10.40	61.72	19.2	27.91	9.11	19.3	44.72	30.94	19.4	55.02	50
20.1	25.94	46.21	20.2	10.04	61.59	20.2	26.58	9.08	20.3	44.57	31.06	20.4	54.83	50
21.1	25.80	46.01	21.2	9.69	61.48	21.2	25.26	9.07	21.3	44.42	31.19	21.4	54.66	50
22.1	25.67	45.82	22.2	9.32	61.38	22.2	23.92	9.07	22.3	44.28	31.33	22.4	54.50	50
23.1	25.54	45.63	23.2	8.94	61.28	23.2	22.53	9.07	23.3	44.13	31.49	23.4	54.33	51
24.1	25.39	45.43	24.2	8.54	61.17	24.2	21.09	9.07	24.3	43.97	31.65	24.4	54.16	51.6
25.1	25.24	45.21	25.2	8.13	61.06	25.2	19.58	9.07	25.3	43.80	31.81	25.4	53.98	51.9
26.1	25.08	44.97	26.2	7.71	60.93	26.2	18.04	9.05	26.3	43.63	31.95	26.4	53.76	52.33
27.1	24.93	44.72	27.2	7.29	60.77	27.2	16.47	9.01	27.3	43.45	32.08	27.4	53.52	52.68
28.1	24.79	44.44	28.1	6.88	60.60	28.2	14.88	8.95	28.3	43.27	32.19	28.4	53.26	53.0
29.1	24.65	44.15	29.1	6.47	60.41	29.2	13.31	8.87	29.3	43.08	32.29	29.4	52.97	53.35
30.1	24.52	43.84	30.1	6.08	60.20	30.2	11.77	8.77	30.3	42.89	32.37	30.4	52.67	53.67
31.1	24.39	43.53	31.1	5.71	59.98	31.2	10.28	8.65	31.3	42.71	32.42	31.4	52.37	53.97
	7.35	+7.28		16.95	+16.92		58.42	+58.42		7.39	+7.32		18.18	+18.15
	$16^h\ 54^m$	$37^s.997$		$17^h\ 59^m$	$40^s.30$		$19^h\ 5^m$	$3^s.27$		$20^h\ 48^m$	$48^s.820$		$23^h\ 27^m$	$44^s.653$
	+82° 10′	44″.05		+86° 36′	51″.19		+89° 0′	51″.13		+82° 13′	2″.89		+86° 50′	19″.16

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Ursæ Minoris. Mag. 4.4			δ Ursæ Minoris. Mag. 4.4			λ Ursæ Minoris. Mag. 6.6			76 Draconis. Mag. 5.7			39 H. Cephei. Mag. 5.6		
an ar te.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*
	h m	° '		h m	° '		h m	° '		h m	° '		h m	° '
v.	16 54	+82 10	Nov.	17 58	+86 36	Nov.	19 2	+89 1	Nov.	20 48	+82 13	Nov.	23 27	+86 50
	s	''		s	''		s	''		s	''		s	''
.1	24.39	43.53	0.1	65.71	59.98	0.2	70.28	8.65	0.3	42.71	32.42	0.4	52.37	53.97
.1	24.28	43.22	1.1	65.35	59.76	1.2	68.86	8.53	1.3	42.52	32.46	1.4	52.07	54.25
.1	24.17	42.92	2.1	65.02	59.55	2.2	67.51	8.41	2.3	42.35	32.50	2.4	51.78	54.51
.1	24.07	42.64	3.1	64.70	59.34	3.2	66.22	8.30	3.3	42.18	32.53	3.4	51.50	54.76
.1	23.97	42.38	4.1	64.39	59.15	4.2	64.96	8.20	4.2	42.02	32.57	4.4	51.25	55.01
.1	23.86	42.13	5.1	64.06	58.98	5.2	63.70	8.12	5.2	41.87	32.64	5.4	51.01	55.27
.1	23.75	41.89	6.1	63.72	58.83	6.2	62.40	8.06	6.2	41.72	32.73	6.4	50.79	55.55
.1	23.63	41.64	7.1	63.37	58.67	7.2	61.02	8.00	7.2	41.56	32.82	7.4	50.56	55.85
.1	23.50	41.38	8.1	63.00	58.50	8.2	59.56	7.94	8.2	41.40	32.92	8.3	50.32	56.17
.1	23.37	41.09	9.1	62.60	58.31	9.2	58.04	7.86	9.2	41.22	33.01	9.3	50.04	56.49
.1	23.23	40.78	10.1	62.20	58.09	10.2	56.47	7.75	10.2	41.03	33.08	10.3	49.72	56.81
.1	23.11	40.43	11.1	61.81	57.84	11.2	54.91	7.61	11.2	40.82	33.12	11.3	49.37	57.12
.1	23.00	40.07	12.1	61.45	57.57	12.2	53.40	7.43	12.2	40.62	33.12	12.3	49.00	57.40
3.1	22.90	39.71	13.1	61.12	57.29	13.1	51.99	7.24	13.2	40.43	33.10	13.3	48.62	57.64
4.1	22.83	39.35	14.1	60.82	57.00	14.1	50.68	7.04	14.2	40.26	33.06	14.3	48.25	57.86
5.1	22.76	39.01	15.1	60.55	56.72	15.1	49.47	6.86	15.2	40.09	33.01	15.3	47.90	58.06
6.1	22.69	38.69	16.1	60.29	56.47	16.1	48.33	6.68	16.2	39.92	32.98	16.3	47.58	58.26
7.0	22.62	38.39	17.1	60.04	56.23	17.1	47.23	6.52	17.2	39.77	32.95	17.3	47.27	58.45
8.0	22.55	38.11	18.1	59.78	56.01	18.1	46.12	6.38	18.2	39.63	32.94	18.3	46.99	58.65
9.0	22.48	37.83	19.1	59.52	55.79	19.1	44.99	6.24	19.2	39.48	32.94	19.3	46.72	58.86
0.0	22.39	37.54	20.1	59.24	55.57	20.1	43.81	6.11	20.2	39.32	32.93	20.3	46.43	59.08
1.0	22.30	37.24	21.1	58.95	55.35	21.1	42.59	5.97	21.2	39.16	32.94	21.3	46.13	59.31
2.0	22.22	36.93	22.1	58.64	55.11	22.1	41.32	5.82	22.2	38.99	32.93	22.3	45.81	59.55
3.0	22.14	36.59	23.1	58.34	54.85	23.1	40.02	5.65	23.2	38.81	32.92	23.3	45.46	59.78
4.0	22.05	36.24	24.1	58.05	54.57	24.1	38.72	5.46	24.2	38.63	32.89	24.3	45.09	60.00
5.0	21.98	35.87	25.1	57.76	54.27	25.1	37.44	5.25	25.2	38.45	32.83	25.3	44.71	60.21
6.0	21.92	35.51	26.1	57.49	53.96	26.1	36.20	5.02	26.2	38.27	32.75	26.3	44.32	60.40
7.0	21.86	35.13	27.1	57.24	53.63	27.1	35.00	4.77	27.2	38.09	32.65	27.3	43.91	60.58
28.0	21.82	34.75	28.1	57.01	53.30	28.1	33.88	4.52	28.2	37.92	32.54	28.3	43.50	60.73
29.0	21.79	34.37	29.1	56.81	52.97	29.1	32.83	4.26	29.2	37.76	32.42	29.3	43.09	60.86
30.0	21.76	34.01	30.1	56.63	52.66	30.1	31.87	4.01	30.2	37.61	32.30	30.3	42.71	60.98
31.0	21.73	33.67	31.1	56.45	52.37	31.1	30.96	3.78	31.2	37.47	32.18	31.3	42.35	61.10
	7.35	+7.28		16.94	+16.91		58.38	+58.37		7.39	+7.33		18.19	+18.17
	16h 54m	37s.997		17h 59m	40s.30		19h 5m	3s.27		20h 48m	48s.820		23h 27m	44s.653
	+82° 10'	44''.05		+86° 36'	51''.19		+89° 0'	51''.13		+82° 13'	2''.89		+86° 50'	19''.16

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ε Ursæ Minoris. Mag. 4.4			**δ Ursæ Minoris.** Mag. 4.4			**λ Ursæ Minoris.** Mag. 6.6			**76 Draconis.** Mag. 5.7			**39 H. Cephei.** Mag. 5.6		
Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Declination *North.*	Mean Solar Date.	Right Ascension.	Decli- nati- *Nort*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Dec.	16 54	+82 10	Dec.	17 58	+86 36	Dec.	19 2	+89 0	Dec.	20 48	+82 13	Dec.	23 27	+86
	s	″		s	″		s	″		s	″		s	″
1.0	21.73	33.67	1.1	56.45	52.37	1.1	30.96	63.78	1.2	37.47	32.18	1.3	42.35	1.1
2.0	21.70	33.35	2.1	56.27	52.10	2.1	30.07	63.56	2.2	37.33	32.08	2.3	42.02	1.2
3.0	21.67	33.05	3.1	56.09	51.84	3.1	29.15	63.36	3.2	37.19	31.99	3.3	41.71	1.3
4.0	21.62	32.75	4.0	55.89	51.59	4.1	28.20	63.18	4.2	37.04	31.92	4.3	41.39	1.5
5.0	21.57	32.43	5.0	55.67	51.33	5.1	27.18	62.99	5.2	36.90	31.86	5.3	41.06	1.6
5.9	21.51	32.09	6.0	55.43	51.05	6.1	26.07	62.79	6.2	36.75	31.80	6.3	40.71	1.8
6.9	21.45	31.74	7.0	55.18	50.75	7.1	24.91	62.57	7.2	36.58	31.72	7.3	40.33	2.0
7.9	21.41	31.36	8.0	54.94	50.42	8.1	23.76	62.32	8.2	36.40	31.61	8.3	39.92	2.1
8.9	21.38	30.95	9.0	54.73	50.07	9.1	22.64	62.04	9.2	36.23	31.47	9.3	39.47	2.3
9.9	21.35	30.54	10.0	54.54	49.70	10.1	21.62	61.74	10.1	36.05	31.31	10.3	39.02	2.4
10.9	21.34	30.13	11.0	54.39	49.33	11.1	20.70	61.43	11.1	35.89	31.12	11.3	38.57	2.5
11.9	21.35	29.75	12.0	54.27	48.97	12.1	19.90	61.13	12.1	35.75	30.92	12.3	38.14	2.5
12.9	21.36	29.38	13.0	54.17	48.63	13.1	19.20	60.83	13.1	35.62	30.72	13.3	37.74	2.6
13.9	21.37	29.03	14.0	54.08	48.31	14.1	18.56	60.55	14.1	35.49	30.52	14.2	37.36	2.6
14.9	21.39	28.71	15.0	54.00	48.01	15.1	17.94	60.29	15.1	35.38	30.35	15.2	37.02	2.6
15.9	21.39	28.39	16.0	53.91	47.72	16.1	17.31	60.04	16.1	35.26	30.19	16.2	36.68	2.7
16.9	21.40	28.08	17.0	53.81	47.43	17.1	16.65	59.80	17.1	35.14	30.03	17.2	36.34	2.8
17.9	21.40	27.76	18.0	53.70	47.14	18.1	15.96	59.56	18.1	35.02	29.88	18.2	36.00	2.8
18.9	21.39	27.43	19.0	53.58	46.84	19.1	15.22	59.31	19.1	34.89	29.72	19.2	35.64	2.9
19.9	21.39	27.09	20.0	53.46	46.53	20.0	14.46	59.04	20.1	34.76	29.56	20.2	35.26	3.0
20.9	21.39	26.73	21.0	53.33	46.19	21.0	13.69	58.76	21.1	34.62	29.38	21.2	34.85	3.0
21.9	21.40	26.36	21.9	53.22	45.84	22.0	12.93	58.45	22.1	34.48	29.18	22.2	34.43	3.1
22.9	21.41	25.98	22.9	53.12	45.49	23.0	12.22	58.13	23.1	34.34	28.96	23.2	34.00	3.1
23.9	21.43	25.59	23.9	53.05	45.12	24.0	11.56	57.79	24.1	34.21	28.72	24.2	33.56	3.1
24.9	21.47	25.20	24.9	53.00	44.74	25.0	10.96	57.45	25.1	34.08	28.47	25.2	33.11	3.1
25.9	21.51	24.82	25.9	52.97	44.36	26.0	10.47	57.11	26.1	33.96	28.21	26.2	32.68	3.1
26.9	21.57	24.46	26.9	52.97	43.99	27.0	10.05	56.77	27.1	33.85	27.93	27.2	32.27	3.0
27.9	21.63	24.12	27.9	52.98	43.65	28.0	9.71	56.44	28.1	33.75	27.67	28.2	31.88	3.0
28.9	21.69	23.81	28.9	53.00	43.33	29.0	9.41	56.13	29.1	33.66	27.42	29.2	31.52	2.9
29.9	21.74	23.51	29.9	53.01	43.03	30.0	9.11	55.85	30.1	33.57	27.18	30.2	31.18	2.9
30.9	21.78	23.21	30.9	53.01	42.74	31.0	8.79	55.58	31.1	33.48	26.97	31.2	30.85	2.9
31.9	21.82	22.92	31.9	53.00	42.45	32.0	8.39	55.32	32.1	33.40	26.77	32.2	30.52	2.8
7.34		+7.27	16.93		+16.90	58.28		+58.27	7.39		+7.32	18.20		+18.1
16^{h} 54^{m}		$37^{s}.997$	17^{h} 59^{m}		$40^{s}.30$	19^{h} 5^{m}		$3^{s}.27$	20^{h} 48^{m}		$48^{s}.820$	23^{h} 27^{m}		$44^{s}.6$
+82° 10′		44″.05	+86° 36′		51″.19	+89° 0′		51″.13	+82° 13′		2″.89	+86° 50′		19″.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**33 Piscium.** Mag. 4.7				**α Andromedæ.** (*Alpheratz.*) Mag. 2.2				**β Cassiopeiæ.** Mag. 2.4				**ε Phœnicis.** Mag. 3.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	0 0		− 6 10		0 3		+28 37		0 4		+58 40		0 5		−46 12	
	s		″		s		″		s		″		s		″	
Jan. 0.2	59.52		58.9		59.53		28.5		37.47		71.9		6.79		71.2	
10.2	59.42	10	59.4	5	59.40	13	27.6	9	37.17	30	71.2	7	6.60	19	70.8	4
20.2	59.33	9	59.8	4	59.28	12	26.5	11	36.88	29	70.0	12	6.42	18	69.9	9
30.1	59.25	8	60.1	3	59.17	11	25.2	13	36.62	26	68.4	16	6.26	16	68.6	13
Feb. 9.1	59.18	7	60.3	2	59.07	10	23.7	15	36.39	23	66.3	21	6.14	12	66.9	17
19.1	59.14	4	60.2	1	59.01	6	22.1	16	36.21	18	63.9	24	6.04	10	64.9	20
Mar. 1.1	59.12	2	60.0	2	58.97	4	20.5	16	36.09	12	61.4	25	5.98	6	62.5	24
11.0	59.13	1	59.5	5	58.97	0	19.0	15	36.04	5	58.7	27	5.97	1	59.8	27
21.0	59.18	5	58.8	7	59.01	4	17.6	14	36.07	3	56.0	27	6.00	3	56.9	29
31.0	59.26	8	57.9	9	59.10	9	16.5	11	36.17	10	53.5	25	6.08	8	53.9	30
Apr. 10.0	59.39	13	56.7	12	59.23	13	15.6	9	36.36	19	51.2	23	6.21	13	50.7	32
19.9	59.55	16	55.3	14	59.41	18	15.0	6	36.62	26	49.3	19	6.39	18	47.6	31
29.9	59.75	20	53.7	16	59.63	22	14.9	1	36.95	33	47.8	15	6.62	23	44.4	32
May 9.9	59.98	23	51.9	18	59.89	26	15.1	2	37.34	39	46.7	11	6.90	28	41.3	31
19.8	60.25	27	49.9	20	60.19	30	15.7	6	37.79	45	46.1	6	7.22	32	38.4	29
29.8	60.54	29	47.9	20	60.51	32	16.7	10	38.27	48	46.0	1	7.58	36	35.8	26
June 8.8	60.85	31	45.7	22	60.86	35	18.0	13	38.78	51	46.5	5	7.96	38	33.4	24
18.8	61.17	32	43.6	21	61.21	35	19.7	17	39.31	53	47.5	10	8.37	41	31.3	21
28.7	61.49	32	41.5	21	61.56	35	21.6	19	39.83	52	49.0	15	8.78	41	29.7	16
July 8.7	61.81	32	39.5	20	61.91	35	23.8	22	40.34	51	50.9	19	9.19	41	28.5	12
18.7	62.11	30	37.7	18	62.24	33	26.2	24	40.82	48	53.2	23	9.58	39	27.7	8
28.7	62.40	29	36.1	16	62.54	30	28.7	25	41.26	44	55.9	27	9.95	37	27.5	2
Aug. 7.6	62.65	25	34.7	14	62.82	28	31.2	25	41.66	40	58.9	30	10.29	34	27.7	2
17.6	62.88	23	33.5	12	63.06	24	33.8	26	42.00	34	62.1	32	10.59	30	28.3	6
27.6	63.07	19	32.6	9	63.26	20	36.3	25	42.29	29	65.5	34	10.83	24	29.4	11
Sept. 6.5	63.22	15	32.0	6	63.42	16	38.7	24	42.51	22	68.9	34	11.02	19	30.9	15
16.5	63.33	11	31.6	4	63.54	12	41.0	23	42.67	16	72.4	35	11.16	14	32.7	18
26.5	63.40	7	31.5	1	63.62	8	43.2	22	42.76	9	75.8	34	11.24	8	34.8	21
Oct. 6.5	63.43	3	31.7	2	63.66	4	45.1	19	42.80	4	79.1	33	11.26	2	37.0	22
16.4	63.44	1	32.0	3	63.66	0	46.8	17	42.77	3	82.2	31	11.23	3	39.3	23
26.4	63.41	3	32.5	5	63.64	2	48.2	14	42.69	8	85.0	28	11.15	8	41.6	23
Nov. 5.4	63.36	5	33.1	6	63.59	5	49.3	11	42.55	14	87.6	26	11.03	12	43.7	21
15.4	63.29	7	33.8	7	63.51	8	50.2	9	42.37	18	89.7	21	10.88	15	45.6	19
25.3	63.20	9	34.5	7	63.41	10	50.7	5	42.15	22	91.4	17	10.70	18	47.2	16
Dec. 5.3	63.11	9	35.3	8	63.30	11	51.0	3	41.90	25	92.7	13	10.51	19	48.5	13
15.3	63.01	10	36.0	7	63.18	12	50.9	1	41.62	28	93.4	7	10.30	21	49.3	8
25.2	62.90	11	36.7	7	63.05	13	50.5	4	41.33	29	93.6	2	10.09	21	49.7	4
35.2	62.80	10	37.3	6	62.92	13	49.8	7	41.03	30	93.3	3	9.89	20	49.6	1
Sec δ, Tan δ	1.006		−0.108		1.139		+0.546		1.924		+1.644		1.445		−1.043	
Mean Place	$59^{s}.112$		$59''.04$		$59^{s}.450$		$16''.23$		$38^{s}.056$		$51''.55$		$5^{s}.987$		$59''.41$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		+0.01		0.00		−0.04		0.00		−0.11		0.00		+0.07	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		0.0		+0.4		0.0		+0.4		0.0		+0.4		0.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	22 Andromedæ. Mag. 5.1				γ Pegasi. Mag. 2.9				σ Andromedæ. Mag. 4.5				ι Ceti. Mag. 3.8		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.
	h m 0 5 s		° ′ +45 35 ″		h m 0 8 s		° ′ +14 42 ″		h m 0 13 s		° ′ +36 18 ″		h m 0 15 s		° − 9 ″
Jan. 0.2	53.71		74.7		51.69		47.6		53.05		65.4		6.36		42.6
		19		8		11		8		16		8		11	
10.2	53.52		73.9		51.58		46.8		52.89		64.6		6.25		43.2
		19		12		10		9		15		11		10	
20.2	53.33		72.7		51.48		45.9		52.74		63.5		6.15		43.5
		17		16		9		10		13		14		9	
30.2	53.16		71.1		51.39		44.9		52.61		62.1		6.06		43.7
		14		19		8		10		12		16		7	
Feb. 9.1	53.02		69.2		51.31		43.9		52.49		60.5		5.99		43.7
		11		21		6		10		9		18		5	
19.1	52.91		67.1		51.25		42.9		52.40		58.7		5.94		43.5
		7		22		3		9		6		19		3	
Mar. 1.1	52.84		64.9		51.22		42.0		52.34		56.8		5.91		43.1
		2		22		0		7		2		18		1	
11.0	52.82		62.7		51.22		41.3		52.32		55.0		5.90		42.4
		3		22		4		6		2		17		3	
21.0	52.85		60.5		51.26		40.7		52.34		53.3		5.93		41.6
		9		20		8		3		8		16		7	
31.0	52.94		58.5		51.34		40.4		52.42		51.7		6.00		40.5
		15		17		12		1		13		13		11	
Apr. 10.0	53.09		56.8		51.46		40.3		52.55		50.4		6.11		39.1
		20		14		16		2		18		10		14	
19.9	53.29		55.4		51.62		40.5		52.73		49.4		6.25		37.5
		27		10		20		5		23		6		19	
29.9	53.56		54.4		51.82		41.0		52.96		48.8		6.44		35.8
		31		6		24		9		27		2		22	
May 9.9	53.87		53.8		52.06		41.9		53.23		48.6		6.66		33.9
		35		1		27		11		31		2		26	
19.8	54.22		53.7		52.33		43.0		53.54		48.8		6.92		31.8
		38		4		30		14		34		7		28	
29.8	54.60		54.1		52.63		44.4		53.88		49.5		7.20		29.6
		40		8		32		17		36		10		31	
June 8.8	55.00		54.9		52.95		46.1		54.24		50.5		7.51		27.5
		42		13		33		19		37		14		32	
18.8	55.42		56.2		53.28		48.0		54.61		51.9		7.83		25.3
		41		17		33		21		38		18		32	
28.7	55.83		57.9		53.61		50.1		54.99		53.7		8.15		23.2
		41		21		32		21		37		21		32	
July 8.7	56.24		60.0		53.93		52.2		55.36		55.8		8.47		21.2
		38		24		31		22		35		23		31	
18.7	56.62		62.4		54.24		54.4		55.71		58.1		8.78		19.5
		36		27		29		22		33		26		30	
28.7	56.98		65.1		54.53		56.6		56.04		60.7		9.08		17.9
		32		29		27		22		30		26		26	
Aug. 7.6	57.30		68.0		54.80		58.8		56.34		63.3		9.34		16.6
		28		30		23		21		26		28		24	
17.6	57.58		71.0		55.03		60.9		56.60		66.1		9.58		15.5
		23		30		19		19		23		27		20	
27.6	57.81		74.0		55.22		62.8		56.83		68.8		9.78		14.8
		19		31		16		17		18		28		16	
Sept. 6.5	58.00		77.1		55.38		64.5		57.01		71.6		9.94		14.3
		13		31		12		16		13		26		13	
16.5	58.13		80.2		55.50		66.1		57.14		74.2		10.07		14.1
		9		29		8		13		10		25		8	
26.5	58.22		83.1		55.58		67.4		57.24		76.7		10.15		14.2
		4		28		5		12		5		23		5	
Oct. 6.5	58.26		85.9		55.63		68.6		57.29		79.0		10.20		14.6
		0		25		1		0		1		21		2	
16.4	58.26		88.4		55.64		69.5		57.30		81.1		10.22		15.1
		5		23		1		6		2		19		2	
26.4	58.21		90.7		55.63		70.1		57.28		83.0		10.20		15.8
		8		20		4		5		5		16		4	
Nov. 5.4	58.13		92.7		55.59		70.6		57.23		84.6		10.16		16.6
		11		17		6		2		8		12		6	
15.4	58.02		94.4		55.53		70.8		57.15		85.8		10.10		17.4
		14		12		8		0		10		10		8	
25.3	57.88		95.6		55.45		70.8		57.05		86.8		10.02		18.3
		16		8		10		2		12		5		9	
Dec. 5.3	57.72		96.4		55.35		70.6		56.93		87.3		9.93		19.2
		18		4		10		4		14		2		10	
15.3	57.54		96.8		55.25		70.2		56.79		87.5		9.83		20.0
		19		1		11		5		15		2		11	
25.2	57.35		96.7		55.14		69.7		56.64		87.3		9.72		20.7
		20		5		11		8		15		6		10	
35.2	57.15		96.2		55.03		68.9		56.49		86.7		9.62		21.3
Sec δ, Tan δ	1.429		+1.021		1.034		+0.263		1.241		+0.735		1.013		−0.164
Mean Place	53ˢ.898		57″.38		51ˢ.420		39″.81		52ˢ.995		50″.41		5ˢ.845		42″.12
$D'_\psi\,\alpha$, $D_\omega\,\alpha$	0.00		−0.07		0.00		−0.02		0.00		−0.05		0.00		+0.01
$D'_\psi\,\delta$, $D_\omega\,\delta$	+0.4		0.0		+0.4		0.0		+0.4		+0.1		+0.4		+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	**ζ Tucanæ.** Mag. 4.3				**44 Piscium.** Mag. 6.0				**β Hydri.** Mag. 2.9				**α Phœnicis.** Mag. 2.4			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	0 15		−65 21		0 21		+ 1 28		0 21		−77 43		0 22		−42 45	
	s		″		s		″		s		″		s		″	
n. 0.2	40.50		101.3		3.15		11.7		20.53		74.6		6.05		73.8	
10.2	40.10	40	100.4	9	3.04	11	11.1	6	19.63	90	73.5	11	5.87	18	73.7	1
20.2	39.73	37	99.0	14	2.94	10	10.5	6	18.79	84	71.9	16	5.70	17	73.1	6
30.2	39.39	34	97.1	19	2.85	9	10.0	5	18.02	77	69.7	22	5.54	16	72.1	10
b. 9.1	39.11	28	94.7	24	2.78	7	9.5	5	17.36	66	67.0	27	5.40	14	70.7	14
19.1	38.88	23	91.9	28	2.72	6	9.2	3	16.81	55	63.9	31	5.30	10	68.9	18
ar. 1.1	38.72	16	88.8	31	2.68	4	9.0	2	16.39	42	60.5	34	5.22	8	66.7	22
11.0	38.62	10	85.4	34	2.67	1	9.0	0	16.12	27	56.8	37	5.19	3	64.3	24
21.0	38.61	1	81.8	36	2.70	3	9.2	2	16.00	12	53.0	38	5.19	0	61.6	27
31.0	38.67	6	78.1	37	2.76	6	9.6	4	16.04	4	49.1	39	5.25	6	58.7	29
pr. 10.0	38.82	15	74.3	38	2.86	10	10.3	7	16.23	19	45.2	39	5 35	10	55.7	30
19.9	39.04	22	70.6	37	3.01	15	11.3	10	16.57	34	41.4	38	5.50	15	52.6	31
29.9	39.35	31	67.1	35	3.19	18	12.5	12	17.07	50	37.8	36	5.71	21	49.4	32
ay 9.9	39.73	38	63.7	34	3.41	22	14.0	15	17.70	63	34.4	34	5.96	25	46.4	30
19.9	40.18	45	60.6	31	3.67	26	15.6	16	18.46	76	31.4	30	6.25	29	43.4	30
29.8	40.69	51	57.8	28	3.95	28	17.4	18	19.34	88	28.7	27	6.58	33	40.6	28
une 8.8	41.24	55	55.4	24	4.25	30	19.4	20	20.31	97	26.4	23	6.94	36	38.1	25
18.8	41.83	59	53.5	19	4.57	32	21.5	21	21.34	103	24.7	17	7.32	38	35.9	22
28.7	42.44	61	52.0	15	4.89	32	23.6	21	22.41	107	23.5	12	7.71	39	34.0	19
uly 8.7	43.05	61	51.1	9	5.21	32	25.6	20	23.50	109	22.8	7	8.10	39	32.6	14
18.7	43.64	59	50.8	3	5.52	31	27.6	20	24.57	107	22.7	1	8.48	38	31.6	10
28.7	44.21	57	51.0	2	5.81	29	29.5	19	25.59	102	23.2	5	8.84	36	31.1	5
ug. 7.6	44.73	52	51.7	7	6.08	27	31.2	17	26.54	95	24.3	11	9.18	34	31.0	1
17.6	45.19	46	53.0	13	6.31	23	32.7	15	27.38	84	25.9	16	9.48	30	31.4	4
27.6	45.57	38	54.7	17	6.52	21	34.0	13	28.08	70	27.9	20	9.73	25	32.3	9
ept. 6.6	45.87	30	56.8	21	6.68	16	35.1	11	28.63	55	30.4	25	9.94	21	33.6	13
16.5	46.08	21	59.3	25	6.81	13	35.9	8	29.01	38	33.1	27	10.09	15	35.2	16
26.5	46.20	12	62.0	27	6.91	10	36.4	5	29.20	19	36.0	29	10.19	10	37.1	19
ct. 6.5	46.22	2	64.8	28	6.96	5	36.7	3	29.20	0	39.1	31	10.23	4	39.2	21
16.4	46.15	7	67.6	28	6.99	3	36.8	1	29.02	18	42.1	30	10.23	0	41.4	22
26.4	45.99	16	70.3	27	6.98	1	36.7	1	28.65	37	44.9	28	10.18	5	43.7	23
Nov. 5.4	45.75	24	72.8	25	6.95	3	36.5	2	28.13	52	47.5	26	10.09	9	45.8	21
15.4	45.45	30	74.9	21	6.90	5	36.1	4	27.46	67	49.7	22	9.97	12	47.8	20
25.3	45.09	36	76.7	18	6.83	7	35.6	5	26.67	79	51.4	17	9.82	15	49.5	17
Dec. 5.3	44.70	39	77.9	12	6.75	8	35.0	6	25.80	87	52.6	12	9.65	17	51.0	15
15.3	44.29	41	78.6	7	6.66	9	34.3	7	24.88	92	53.2	6	9.47	18	52.0	10
25.3	43.87	42	78.7	1	6.56	10	33.7	6	23.94	94	53.1	1	9.28	19	52.6	6
35.2	43.46	41	78.2	5	6.45	11	33.0	7	23.01	93	52.4	7	9.09	19	52.8	2
ec δ, Tan δ	2.400		−2.181		1.000		+0.026		4.706		−4.598		1.362		−0.925	
ean Place	$39^{s}.189$		$86''.29$		$2^{s}.687$		$8''.31$		$18^{s}.226$		$58''.65$		$5^{s}.172$		$63''.30$	
D′ψ α, Dω α	0.00		+0.15		0.00		0.00		−0.01		+0.31		0.00		+0.06	
Dψ δ, Dω δ	+0.4		+0.1		+0.4		+0.1		+0.4		+0.1		+0.4		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**12 Ceti.** Mag. 6.0				**13 Ceti.** Mag. 5.2				**ζ Cassiopeiæ.** Mag. 3.7				**π Andromedæ.** Mag. 4.4			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Dec tion	
	h m		° ′		h m		° ′		h m		° ′		h m		°	
	0 25		− 4 25		0 30		− 4 3		0 32		+53 25		0 32		+33	
	s		″		s		″		s		″		s		″	
Jan. 0.2	42.60	10	35.0	6	52.90	10	36.3	6	13.65	25	65.6	4	20.46	14	20.4	
10.2	42.50	10	35.6	5	52.80	10	36.9	5	13.40	24	65.2	9	20.32	14	19.8	
20.2	42.40	9	36.1	3	52.70	10	37.4	3	13.16	24	64.3	14	20.18	14	18.8	
30.2	42.31	8	36.4	2	52.60	8	37.7	3	12.92	21	62.9	17	20.04	12	17.6	
Feb. 9.1	42.23	7	36.6	1	52.52	7	38.0	0	12.71	18	61.2	21	19.92	10	16.2	
19.1	42.16	4	36.7	1	52.45	4	38.0	1	12.53	13	59.1	23	19.82	8	14.6	
Mar. 1.1	42.12	1	36.6	4	52.41	2	37.9	3	12.40	8	56.8	24	19.74	3	13.0	
11.1	42.11	2	36.2	6	52.39	2	37.6	5	12.32	1	54.4	24	19.71	1	11.3	
21.0	42.13	6	35.6	8	52.41	5	37.1	8	12.31	6	52.0	24	19.72	5	9.7	
31.0	42.19	10	34.8	10	52.46	9	36.3	11	12.37	12	49.6	21	19.77	11	8.3	
Apr. 10.0	42.29	13	33.8	13	52.55	14	35.2	12	12.49	19	47.5	19	19.88	15	7.1	
19.9	42.42	18	32.5	15	52.69	17	34.0	15	12.68	27	45.6	15	20.03	20	6.3	
29.9	42.60	22	31.0	17	52.86	21	32.5	17	12.95	32	44.1	11	20.23	25	5.7	
May 9.9	42.82	25	29.3	19	53.07	25	30.8	19	13.27	37	43.0	7	20.48	29	5.5	
19.9	43.07	28	27.4	20	53.32	27	28.9	20	13.64	42	42.3	1	20.77	32	5.8	
29.8	43.35	30	25.4	21	53.59	30	26.9	21	14.06	45	42.2	3	21.09	35	6.4	
June 8.8	43.65	31	23.3	22	53.89	32	24.8	21	14.51	47	42.5	8	21.44	36	7.4	
18.8	43.96	32	21.1	21	54.21	32	22.7	21	14.98	48	43.3	13	21.80	37	8.7	
28.8	44.28	32	19.0	20	54.53	32	20.6	20	15.46	47	44.6	17	22.17	37	10.4	
July 8.7	44.60	31	17.0	19	54.85	32	18.6	19	15.93	45	46.3	21	22.54	35	12.4	
18.7	44.91	30	15.1	17	55.17	29	16.7	18	16.38	42	48.4	24	22.89	33	14.6	
28.7	45.21	27	13.4	15	55.46	28	14.9	15	16.80	39	50.8	27	23.22	31	17.0	
Aug. 7.6	45 48	24	11.9	13	55.74	24	13.4	13	17.19	35	53.5	30	23.53	28	19.4	
17.6	45.72	20	10.6	10	55.98	21	12.1	10	17.54	30	56.5	31	23.81	23	22.0	
27.6	45.92	18	9.6	7	56.19	18	11.1	8	17.84	25	59.6	32	24.04	20	24.6	
Sept. 6.6	46.10	13	8.9	5	56.37	14	10.3	5	18.09	20	62.8	32	24.24	16	27.1	
16.5	46.23	10	8.4	2	56.51	10	9.8	2	18.29	14	66.0	32	24.40	11	29.6	
26.5	46.33	6	8.2	1	56.61	7	9.6	1	18.43	8	69.2	31	24.51	8	31.9	
Oct. 6.5	46.39	3	8.3	2	56.68	3	9.7	2	18.51	4	72.3	29	24.59	4	34.1	20
16.5	46.42	0	8.5	5	56.71	1	9.9	4	18.55	2	75.2	28	24.63	0	36.1	17
26.4	46.42	3	9.0	5	56.72	3	10.3	6	18.53	6	78.0	24	24.63	2	37.8	15
Nov. 5.4	46.39	5	9.5	7	56.69	4	10.9	7	18.47	11	80.4	22	24.61	6	39.3	12
15.4	46.34	7	10.2	7	56.65	7	11.6	7	18.36	14	82.6	17	24.55	8	40.5	8
25.3	46.27	9	10.9	8	56.58	8	12.3	8	18.22	18	84.3	14	24.47	10	41.3	6
Dec. 5.3	46.18	9	11.7	8	56.50	9	13.1	7	18.04	21	85.7	8	24.37	12	41.9	
15.3	46.09	10	12.5	7	56.41	10	13.8	7	17.83	23	86.5	4	24.25	14	42.1	1
25.3	45.99	11	13.2	6	56.31	10	14.5	7	17.60	25	86.9	1	24.11	14	42.0	5
35.2	45.88		13.8		56.21		15.2		17.35		86.8		23.97		41.5	
Sec δ, Tan δ	1.003		−0.077		1.003		−0.071		1.679		+1.348		1.196		+0.656	
Mean Place	42ˢ.071		36″.49		52ˢ.341		38″.03		13ˢ.732		45″.39		20ˢ.224		5″.76	
D′ψ α, Dω α	0.00		+0.01		0.00		0.00		0.00		−0.09		0.00		−0.04	
Dψ δ, Dω δ	+0.4		+0.1		+0.4		+0.1		+0.4		+0.1		+0.4		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**ε Andromedæ.** Mag. 4.5				**δ Andromedæ.** Mag. 3.5				**α Cassiopeiæ.** (*Schedir.*) Var. 2.2–2.8				**μ Phœnicis.** Mag. 4.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 0 34		° ′ +28 51		h m 0 34		° ′ +30 23		h m 0 35		° ′ +56 4		h m 0 37		° ′ −46 32	
	s		″		s		″		s		″		s		″	
an. 0.2	3.92		14.7		47.03		59.0		40.40		37.7		19.65		77.7	
10.2	3.79	13	14.0	7	46.90	13	58.3	7	40.12	28	37.4	3	19.44	21	77.6	1
20.2	3.66	13	13.1	9	46.76	14	57.4	9	39.85	27	36.6	8	19.23	21	77.0	6
30.2	3.53	13	12.0	11	46.63	13	56.3	11	39.59	26	35.2	14	19.05	18	76.0	10
eb. 9.1	3.42	11	10.7	13	46.51	12	54.9	14	39.36	23	33.5	17	18.88	17	74.5	15
19.1	3.32	10	9.2	15	46.42	9	53.4	15	39.16	20	31.4	21	18.74	14	72.6	19
ar 1.1	3.25	7	7.7	15	46.35	7	51.9	15	39.01	15	29.1	23	18.63	11	70.4	22
11.1	3.22	3	6.3	14	46.31	4	50.3	16	38.92	9	26.7	24	18.56	7	67.8	26
21.0	3.23	1	4.9	14	46.32	1	48.9	14	38.89	3	24.2	25	18.54	2	65.0	28
31.0	3.28	5	3.7	12	46.37	5	47.7	12	38.94	5	21.7	25	18.57	3	62.0	30
pr. 10.0	3.38	10	2.8	9	46.47	10	46.6	11	39.07	13	19.5	22	18.65	8	58.8	32
19.9	3.53	15	2.1	7	46.62	15	45.9	7	39.27	20	17.5	20	18.78	13	55.5	33
29.9	3.72	19	1.8	3	46.82	20	45.5	4	39.54	27	15.8	17	18.97	19	52.2	33
ay 9.9	3.96	24	1.8	0	47.06	24	45.4	1	39.87	33	14.6	12	19.21	24	49.0	32
19.9	4.24	28	2.2	4	47.34	28	45.8	4	40.26	39	13.8	8	19.49	28	45.9	31
29.8	4.55	31	3.0	8	47.65	31	46.5	7	40.70	44	13.5	3	19.82	33	43.0	29
une 8.8	4.88	33	4.2	12	47.99	34	47.6	11	41.17	47	13.7	2	20.18	36	40.3	27
18.8	5.23	35	5.6	14	48.35	36	49.0	14	41.66	49	14.4	7	20.57	39	38.0	23
28.8	5.59	36	7.3	17	48.71	36	50.7	17	42.16	50	15.6	12	20.97	40	36.0	20
uly 8.7	5.94	35	9.3	20	49.07	36	52.6	19	42.66	50	17.2	16	21.38	41	34.5	15
18.7	6.28	34	11.5	22	49.41	34	54.8	22	43.14	48	19.2	20	21.78	40	33.5	10
28.7	6.61	33	13.8	23	49.74	33	57.2	24	43.59	45	21.6	24	22.17	39	32.9	6
ug. 7.6	6.90	29	16.2	24	50.04	30	59.6	24	44.00	41	24.3	27	22.53	36	32.9	0
17.6	7.17	27	18.7	25	50.31	27	62.1	25	44.38	38	27.2	29	22.85	32	33.3	4
27.6	7.40	23	21.1	24	50.55	24	64.6	25	44.70	32	30.3	31	23.13	28	34.2	9
Sept. 6.6	7.60	20	23.4	23	50.75	20	67.0	24	44.96	26	33.6	33	23.36	23	35.6	14
16.5	7.75	15	25.7	23	50.90	15	69.3	23	45.17	21	36.9	33	23.54	18	37.3	17
26.5	7.86	11	27.8	21	51.02	12	71.5	22	45.33	16	40.1	32	23.66	12	39.4	21
Oct. 6.5	7.94	8	29.7	19	51.10	8	73.5	20	45.42	9	43.3	32	23.72	6	41.6	22
16.5	7.98	4	31.4	17	51.14	4	75.3	18	45.46	4	46.4	31	23.73	1	44.0	24
26.4	7.99	1	32.9	15	51.15	1	76.8	15	45.44	2	49.3	29	23.69	4	46.4	24
Nov. 5.4	7.97	2	34.1	12	51.13	2	78.2	14	45.38	6	51.8	25	23.61	8	48.8	24
15.4	7.92	5	35.1	10	51.08	5	79.2	10	45.26	12	54.1	23	23.48	13	51.0	22
25.3	7.85	7	35.8	7	51.00	8	80.0	8	45.10	16	56.0	19	23.32	16	52.9	19
Dec. 5.3	7.75	10	36.1	3	50.91	9	80.4	4	44.91	19	57.4	14	23.14	18	54.5	16
15.3	7.64	11	36.2	1	50.80	11	80.6	2	44.69	22	58.4	10	22.94	20	55.6	11
25.3	7.52	12	36.0	2	50.67	13	80.4	2	44.44	25	58.9	5	22.73	21	56.3	7
35.2	7.39	13	35.5	5	50.54	13	79.9	5	44.17	27	58.9	0	22.52	21	56.6	3
Sec δ, Tan δ	1.142		+0.551		1.159		+0.587		1.792		+1.487		1.454		−1.056	
Mean Place	$3^{s}.624$		$1''.40$		$46^{s}.744$		$45''.13$		$40^{s}.497$		$16''.87$		$18^{s}.605$		$66''.68$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		−0.04		0.00		−0.04		+0.01		−0.10		0.00		+0.07	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		+0.1		+0.4		+0.2		+0.4		+0.2		+0.4		+0.2	

Mean Solar Date.	β Ceti. Mag. 2.2				o Cassiopeiæ. Mag. 4.7				21 Cassiopeiæ. Mag. 5.6				ζ Andromedæ. Mag. 4.3		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	0 39		−18 26		0 39		+47 49		0 39		+74 31		0 42		+23 4
	s		″		s		″		s		″		s		″
Jan. 0.3	20.14		73.4		59.07		28.8		59.78		49.4		50.21		29.8
10.2	20.03	11	73.8	4	58.86	21	28.5	3	59.08	70	49.5	1	50.09	12	29.2
20.2	19.91	12	74.0	2	58.65	21	27.6	9	58.39	69	48.9	6	49.96	13	28.4
30.2	19.80	11	73.9	1	58.45	20	26.3	13	57.73	66	47.7	12	49.84	12	27.3
Feb. 9.1	19.70	10	73.6	3	58.27	18	24.7	16	57.12	61	46.1	16	49.73	11	26.2
19.1	19.62	8	73.0	6	58.11	16	22.8	19	56.60	52	43.9	22	49.64	9	25.0
Mar. 1.1	19.57	5	72.1	9	57.99	12	20.7	21	56.20	40	41.4	25	49.57	7	23.7
11.1	19.53	4	71.0	11	57.92	7	18.5	22	55.92	28	38.7	27	49.53	4	22.5
21.0	19.54	1	69.6	14	57.91	1	16.3	22	55.78	14	35.7	30	49.53	0	21.5
31.0	19.58	4	68.0	16	57.95	4	14.2	21	55.80	2	32.8	29	49.58	5	20.6
Apr. 10.0	19.66	8	66.1	19	58.06	11	12.3	19	55.98	18	30.0	28	49.67	9	19.9
20.0	19.78	12	64.1	20	58.23	17	10.6	17	56.31	33	27.3	27	49.80	13	19.5
29.9	19.95	17	61.9	22	58.46	23	9.3	13	56.78	47	25.0	23	49.98	18	19.4
May 9.9	20.15	20	59.5	24	58.75	29	8.4	9	57.38	60	23.1	19	50.21	23	19.7
19.9	20.39	24	57.1	24	59.08	33	7.9	5	58.10	72	21.6	15	50.47	26	20.3
29.8	20.67	28	54.7	24	59.46	38	7.9	0	58.90	80	20.6	10	50.76	29	21.2
June 8.8	20.97	30	52.3	24	59.87	41	8.4	5	59.77	87	20.2	4	51.08	32	22.5
18.8	21.29	32	50.0	23	60.29	42	9.2	8	60.68	91	20.3	1	51.42	34	24.0
28.8	21.62	33	47.9	21	60.73	44	10.5	13	61.60	92	21.0	7	51.76	34	25.8
July 8.7	21.95	33	45.9	20	61.16	43	12.2	17	62.52	92	22.2	12	52.10	34	27.7
18.7	22.27	32	44.3	16	61.58	42	14.3	21	63.42	90	23.9	17	52.44	34	29.9
28.7	22.58	31	42.9	14	61.97	39	16.7	24	64.26	84	26.1	22	52.76	32	32.1
Aug. 7.6	22.87	29	41.8	11	62.34	37	19.3	26	65.03	77	28.7	26	53.05	29	34.3
17.6	23.12	25	41.1	7	62.67	33	22.1	28	65.72	69	31.6	29	53.32	27	36.6
27.6	23.35	23	40.7	4	62.95	28	25.0	29	66.33	61	34.8	32	53.55	23	38.8
Sept. 6.6	23.54	19	40.7	0	63.19	24	28.0	30	66.83	50	38.3	35	53.75	20	40.9
16.5	23.69	15	41.1	4	63.38	19	31.0	30	67.21	38	41.9	36	53.91	16	42.9
26.5	23.80	11	41.7	6	63.53	15	34.0	30	67.48	27	45.6	37	54.03	12	44.7
Oct. 6.5	23.88	8	42.6	9	63.62	9	36.9	29	67.63	15	49.3	37	54.12	9	46.3
16.5	23.91	3	43.7	11	63.67	5	39.6	27	67.66	3	53.0	37	54.17	5	47.8
26.4	23.91	0	44.9	12	63.68	1	42.1	25	67.57	9	56.5	35	54.19	2	49.0
Nov. 5.4	23.89	2	46.2	13	63.64	4	44.3	22	67.37	20	59.8	33	54.18	1	49.9
15.4	23.83	6	47.5	13	63.56	8	46.2	19	67.06	31	62.7	29	54.14	4	50.6
25.4	23.76	7	48.8	13	63.45	11	47.8	16	66.64	42	65.3	26	54.08	6	51.1
Dec. 5.3	23.67	9	50.0	12	63.31	14	49.0	12	66.14	50	67.5	22	54.00	8	51.4
15.3	23.56	11	51.0	10	63.14	17	49.7	7	65.55	59	69.1	16	53.90	10	51.3
25.3	23.45	11	51.8	8	62.96	18	50.0	3	64.91	64	70.1	10	53.79	11	51.1
35.2	23.33	12	52.4	6	62.75	21	49.8	2	64.23	68	70.6	5	53.67	12	50.6
Sec δ, Tan δ	1.054		−0.334		1.490		+1.104		3.749		+3.613		1.093		+0.441
Mean Place	19ˢ.419		70″.44		58ˢ.953		9″.82		60ˢ.695		25″.22		49ˢ.797		17″.90
D′ψ α, Dω α	0.00		+0.02		+0.01		−0.07		+0.02		−0.24		0.00		−0.03
D′ψ δ, Dω δ	+0.4		+0.2		+0.4		+0.2		+0.4		+0.2		+0.4		+0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Cassiopeiæ. Mag. 3.6				δ Piscium. Mag. 4.6				λ Hydri. Mag. 5.0				20 Ceti. Mag. 4.9			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 0 43		° ′ +57 21		h m 0 44		° ′ + 7 7		h m 0 45		° ′ −75 22		h m 0 48		° ′ − 1 35	
	s		″		s		″		s		″		s		″	
Jan. 0.3	56.94		78.5		16.81		27.9		41.52		84.0		40.39		76.5	
10.2	56.66	28	78.3	2	16.70	11	27.2	7	40.73	79	83.3	7	40.29	10	77.1	6
20.2	56.37	29	77.6	7	16.59	11	26.5	7	39.97	76	82.0	13	40.18	11	77.7	6
30.2	56.10	27	76.3	13	16.49	10	25.8	7	39.26	71	80.2	18	40.08	10	78.1	4
Feb. 9.1	55.85	25	74.7	16	16.40	9	25.2	6	38.62	64	77.9	23	39.98	10	78.5	4
19.1	55.64	21	72.7	20	16.32	8	24.7	5	38.07	55	75.1	28	39.90	8	78.7	2
Mar 1.1	55.47	17	70.4	23	16.26	6	24.2	5	37.62	45	71.9	32	39.84	6	78.7	0
11.1	55.36	11	67.9	25	16.23	3	23.9	3	37.29	33	68.5	34	39.81	3	78.5	2
21.0	55.33	3	65.3	26	16.23	0	23.8	1	37.07	22	64.8	37	39.80	1	78.1	4
31.0	55.36	3	62.8	25	16.27	4	23.9	1	36.98	9	61.0	38	39.84	4	77.5	6
Apr. 10.0	55.48	12	60.5	23	16.35	8	24.2	3	37.03	5	57.1	39	39.91	7	76.6	9
20.0	55.67	19	58.4	21	16.48	13	24.8	6	37.22	19	53.3	38	40.03	12	75.5	11
29.9	55.94	27	56.6	18	16.64	16	25.6	8	37.53	31	49.5	38	40.19	16	74.2	13
May 9.9	56.28	34	55.3	13	16.85	21	26.8	12	37.97	44	46.0	35	40.39	20	72.6	16
19.9	56.68	40	54.4	9	17.09	24	28.2	14	38.53	56	42.7	33	40.62	23	70.9	17
29.8	57.12	44	53.9	5	17.36	27	29.7	15	39.20	67	39.8	29	40.88	26	69.0	19
June 8.8	57.61	49	54.0	1	17.66	30	31.5	18	39.96	76	37.2	26	41.17	29	67.0	20
18.8	58.12	51	54.5	5	17.98	32	33.4	19	40.79	83	35.2	20	41.48	31	64.9	21
28.8	58.64	52	55.6	11	18.30	32	35.4	20	41.67	88	33.6	16	41.80	32	62.8	21
July 8.7	59.15	51	57.1	15	18.62	32	37.4	20	42.57	90	32.6	10	42.12	32	60.7	21
18.7	59.65	50	59.0	19	18.94	32	39.5	21	43.48	91	32.2	4	42.44	32	58.8	19
28.7	60.13	48	61.2	22	19.24	30	41.5	20	44.36	88	32.3	1	42.74	30	57.0	18
Aug. 7.7	60.57	44	63.8	26	19.52	28	43.3	18	45.19	83	33.0	7	43.02	28	55.4	16
17.6	60.97	40	66.7	29	19.78	26	45.0	17	45.95	76	34.3	13	43.28	26	54.0	14
27.6	61.31	34	69.8	31	20.00	22	46.6	16	46.60	65	36.1	18	43.50	22	52.8	12
Sept. 6.6	61.61	30	72.9	31	20.19	19	47.9	13	47.13	53	38.4	23	43.69	19	51.9	9
16.5	61.84	23	76.2	33	20.34	15	49.0	11	47.52	39	41.0	26	43.85	16	51.3	6
26.5	62.02	18	79.5	33	20.46	12	49.9	9	47.76	24	43.8	28	43.97	12	50.9	4
Oct. 6.5	62.13	11	82.7	32	20.54	8	50.5	6	47.85	9	46.8	30	44.05	8	50.8	1
16.5	62.19	6	85.8	31	20.59	5	50.9	4	47.77	8	49.9	31	44.10	5	51.0	2
26.4	62.19	0	88.7	29	20.61	2	51.1	2	47.54	23	52.9	30	44.12	2	51.3	3
Nov. 5.4	62.14	5	91.4	27	20.60	1	51.2	1	47.17	37	55.7	28	44.12	0	51.7	4
15.4	62.04	10	93.7	23	20.57	3	51.0	2	46.67	50	58.2	25	44.09	3	52.3	6
25.4	61.89	15	95.7	20	20.52	5	50.7	3	46.06	61	60.2	20	44.04	5	53.0	7
Dec. 5.3	61.70	19	97.3	16	20.45	7	50.3	4	45.36	70	61.7	15	43.97	7	53.7	7
15.3	61.48	22	98.4	11	20.36	9	49.8	5	44.60	76	62.7	10	43.88	9	54.4	7
25.3	61.23	25	99.0	6	20.26	10	49.2	6	43.81	79	63.1	4	43.79	9	55.2	8
35.2	60.95	28	99.0	0	20.16	10	48.6	6	43.01	80	62.8	3	43.68	11	55.8	6
Sec δ, Tan δ	1.855		+1.562		1.008		+0.125		3.963		−3.834		1.000		−0.028	
Mean Place	56ˢ.963		57″.15		16ˢ.251		21″.73		39ˢ.057		68″.87		39ˢ.747		79″.65	
D′ψ α, Dω α	+0.01		−0.10		0.00		−0.01		−0.02		+0.26		0.00		0.00	
Dψ δ, Dω δ	+0.4		+0.2		+0.4		+0.2		+0.4		+0.2		+0.4		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Cassiopeiæ. Mag. 2.2				μ Andromedæ. Mag. 3.9				α Sculptoris. Mag. 4.4				ε Piscium. Mag. 4.4		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declina tion N
	h m 0 51		° ′ +60 15		h m 0 52		° ′ +38 2		h m 0 54		° ′ −29 48		h m 0 58		° + 7 2
	s		″		s		″		s		″		s		″
Jan. 0.3	34.04	31	46.3	0	2.17	16	35.3	4	31.52	15	66.7	4	32.45	11	64.5
10.2	33.73	33	46.3	7	2.01	16	34.9	8	31.37	14	67.1	0	32.34	11	63.9
20.2	33.40	31	45.6	11	1.85	16	34.1	11	31.23	14	67.1	3	32.23	11	63.2
30.2	33.09	29	44.5	16	1.69	15	33.0	14	31.09	13	66.8	7	32.12	10	62 6
Feb. 9.2	32.80	25	42.9	20	1.54	13	31.6	16	30.96	11	66.1	11	32.02	9	61.9
19.1	32.55	20	40.9	22	1.41	10	30.0	17	30.85	9	65.0	14	31.93	7	61.4
Mar. 1.1	32.35	14	38.7	25	1.31	6	28.3	18	30.76	6	63.6	17	31.86	4	61.0
11.1	32.21	7	36.2	26	1.25	2	26.5	18	30.70	2	61.9	20	31.82	1	60.6
21.0	32.14	2	33.6	25	1.23	3	24.7	16	30.68	2	59.9	22	31.81	2	60.5
31.0	32.16	11	31.1	25	1.26	9	23.1	15	30.70	6	57.7	25	31.83	7	60.6
Apr. 10.0	32.27	19	28.6	22	1.35	14	21.6	12	30.76	10	55.2	26	31.90	11	60.9
20.0	32.46	27	26.4	19	1.49	19	20.4	8	30.86	15	52.6	27	32.01	15	61.4
29.9	32.73	34	24.5	15	1.68	24	19.6	6	31.01	20	49.9	28	32.16	20	62.2
May 9.9	33.07	41	23.0	11	1.92	29	19.0	1	31.21	23	47.1	28	32.36	23	63.3
19.9	33.48	47	21.9	7	2.21	33	18.9	3	31.44	28	44.3	27	32.59	26	64.6
29.9	33.95	51	21.2	1	2.54	35	19.2	7	31.72	30	41.6	26	32.85	29	66.2
June 8.8	34.46	53	21.1	4	2.89	37	19.9	10	32.02	33	39.0	25	33.14	31	67.9
18.8	34.99	55	21.5	9	3.26	39	20.9	14	32.35	34	36.5	22	33.45	32	69.8
28.8	35.54	55	22.4	13	3.65	39	22.3	18	32.69	35	34.3	19	33.77	33	71.7
July 8.7	36.09	54	23.7	18	4.04	37	24.1	20	33.04	34	32.4	16	34.10	32	73.7
18.7	36.63	51	25.5	22	4.41	36	26.1	23	33.38	33	30.8	11	34.42	30	75.7
28.7	37.14	48	27.7	26	4.77	34	28.4	24	33.71	31	29.7	8	34.72	29	77.7
Aug. 7.7	37.62	43	30.3	28	5.11	30	30.8	25	34.02	29	28.9	3	35.01	26	79.5
17.6	38.05	38	33.1	30	5.41	27	33.3	26	34.31	25	28.6	1	35.27	24	81.2
27.6	38.43	32	36.1	32	5.68	23	35.9	27	34.56	21	28.7	5	35.51	20	82.8
Sept. 6.6	38.75	26	39.3	33	5.91	19	38.6	26	34.77	17	29.2	9	35.71	17	84.1
16.6	39.01	20	42.6	34	6.10	14	41.2	25	34.94	13	30.1	13	35.88	13	85.2
26.5	39.21	14	46.0	33	6.24	11	43.7	24	35.07	9	31.4	15	36.01	9	86.1
Oct. 6.5	39.35	7	49.3	32	6.35	7	46.1	22	35.16	5	32.9	17	36.10	7	86.7
16.5	39.42	1	52.5	31	6.42	3	48.3	20	35.21	0	34.6	18	36.17	3	87.2
26.4	39.43	5	55.6	28	6.45	1	50.3	18	35.21	3	36.4	19	36.20	1	87.4
Nov. 5.4	39.38	11	58.4	25	6.44	4	52.1	15	35.18	5	38.3	18	36.21	2	87.4
15.4	39.27	16	60.9	22	6.40	7	53.6	12	35.13	9	40.1	17	36.19	5	87.3
25.4	39.11	21	63.1	18	6.33	10	54.8	8	35.04	11	41.8	15	36.14	6	87.0
Dec. 5.3	38.90	25	64.9	12	6.23	12	55.6	5	34.93	12	43.3	13	36.08	8	86.6
15.3	38.65	28	66.1	8	6.11	14	56.1	2	34.81	14	44.6	10	36.00	9	86.1
25.3	38.37	31	66.9	3	5.97	15	56.3	3	34.67	14	45.6	6	35.91	10	85.5
35.3	38.06		67.2		5.82		56.0		34.53		46.2		35.81		84.9
Sec δ, Tan δ	2.016		+1.750		1.270		+0.782		1.153		−0.573		1.008		+0.131
Mean Place	$34^s.034$		$24''.17$		$1^s.817$		$18''.68$		$30^s.589$		$60''.63$		$31^s.808$		$57''.90$
$D'_\psi\alpha$, $D_\omega\alpha$	+0.01		−0.11		0.00		−0.05		0.00		+0.04		0.00		−0.01
$D_\psi\delta$, $D_\omega\delta$	+0.4		+0.2		+0.4		+0.2		+0.4		+0.2		+0.4		+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Phœnicis. Mag. 3.4				μ Cassiopeiæ. Mag. 5.3				η Ceti. Mag. 3.6				β Andromedæ. Mag. 2.4			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 2		−47 9		1 2		+54 30		1 4		−10 37		1 4		+35 10	
	s		″		s		″		s		″		s		″	
an. 0.3	18.68		97.0		36.53		35.4		19.63		56.5		58.55		28.7	
10.2	18.45	23	97.2	2	36.29	24	35.3	1	19.52	11	57.1	6	58.40	15	28.3	4
20.2	18.23	22	96.8	4	36.04	25	34.7	6	19.41	11	57.6	5	58.24	16	27.6	7
30.2	18.02	21	96.0	8	35.79	25	33.6	11	19.29	12	57.8	2	58.09	15	26.6	10
Feb. 9.2	17.82	20	94.8	12	35.56	23	32.1	15	19.19	10	57.9	1	57.94	15	25.4	12
19.1	17.65	17	93.1	17	35.36	20	30.3	18	19.09	10	57.7	2	57.81	13	23.9	15
Mar. 1.1	17.51	14	90.9	22	35.19	17	28.2	21	19.02	7	57.3	4	57.71	10	22.3	16
11.1	17.40	11	88.5	24	35.08	11	25.8	24	18.97	5	56.6	7	57.64	7	20.7	16
21.0	17.34	6	85.7	28	35.03	5	23.4	24	18.95	2	55.7	9	57.61	3	19.1	16
31.0	17.33	1	82.7	30	35.05	2	21.0	24	18.96	1	54.6	11	57.63	2	17.6	15
Apr. 10.0	17.37	4	79.5	32	35.14	9	18.8	22	19.02	6	53.2	14	57.70	7	16.3	13
20.0	17.46	9	76.2	33	35.30	16	16.7	21	19.12	10	51.6	16	57.82	12	15.2	11
29.9	17.61	15	72.8	34	35.54	24	14.9	18	19.26	14	49.8	18	57.99	17	14.4	8
May 9.9	17.81	20	69.5	33	35.84	30	13.5	14	19.44	18	47.8	20	58.22	23	14.0	4
19.9	18.07	26	66.3	32	36.20	36	12.5	10	19.66	22	45.7	21	58.49	27	13.9	1
29.9	18.37	30	63.2	31	36.61	41	12.0	5	19.91	25	43.4	23	58.79	30	14.2	3
June 8.8	18.71	34	60.3	29	37.07	46	11.9	1	20.20	29	41.2	22	59.13	34	14.9	7
18.8	19.09	38	57.8	25	37.55	48	12.3	4	20.50	30	39.0	22	59.49	36	15.9	10
28.8	19.48	39	55.7	21	38.04	49	13.2	9	20.82	32	36.8	22	59.86	37	17.3	14
July 8.7	19.89	41	53.9	18	38.54	50	14.4	12	21.14	32	34.7	21	60.24	38	18.9	16
18.7	20.29	40	52.7	12	39.03	49	16.1	17	21.46	32	32.9	18	60.61	37	20.9	20
28.7	20.69	40	51.9	8	39.50	47	18.2	21	21.77	31	31.2	17	60.97	36	23.0	21
Aug. 7.7	21.06	37	51.6	3	39.94	44	20.6	24	22.06	29	29.9	13	61.30	33	25.3	23
17.6	21.41	35	51.9	3	40.35	41	23.2	26	22.33	27	28.8	11	61.61	31	27.7	24
27.6	21.71	30	52.6	7	40.71	36	26.0	28	22.57	24	28.0	8	61.88	27	30.2	25
Sept. 6.6	21.97	26	53.9	13	41.03	32	29.0	30	22.77	20	27.6	4	62.12	24	32.6	24
16.6	22.18	21	55.6	17	41.29	26	32.1	31	22.94	17	27.5	1	62.32	20	35.0	24
26.5	22.33	15	57.6	20	41.50	21	35.2	31	23.08	14	27.6	1	62.48	16	37.4	24
Oct. 6.5	22.43	10	59.9	23	41.65	15	38.2	30	23.18	10	28.1	5	62.60	12	39.6	22
16.5	22.48	5	62.3	24	41.75	10	41.1	29	23.24	6	28.8	7	62.68	8	41.6	20
26.4	22.47	1	64.9	26	41.80	5	43.9	28	23.28	4	29.6	8	62.73	5	43.5	19
Nov. 5.4	22.41	6	67.4	25	41.80	0	46.5	26	23.28	0	30.6	10	62.74	1	45.1	16
15.4	22.31	10	69.8	24	41.75	5	48.8	23	23.25	3	31.7	11	62.72	2	46.5	14
25.4	22.17	14	71.9	21	41.65	10	50.7	19	23.21	4	32.8	11	62.67	5	47.6	11
Dec. 5.3	22.00	17	73.7	18	41.52	13	52.3	16	23.14	7	33.9	11	62.59	8	48.4	8
15.3	21.80	20	75.2	15	41.34	18	53.5	12	23.05	9	34.9	10	62.49	10	48.9	5
25.3	21.59	21	76.2	10	41.13	21	54.1	6	22.96	9	35.7	8	62.36	13	49.0	1
35.3	21.37	22	76.7	5	40.90	23	54.3	2	22.85	11	36.5	8	62.22	14	48.8	2
Sec δ, Tan δ	1.471		−1.079		1.722		+1.402		1.017		−0.188		1.223		+0.705	
Mean Place	$17^{s}.447$		86″.62		$36^{s}.265$		14″.24		$18^{s}.827$		56″.92		$58^{s}.060$		12″.60	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.01		+0.07		+0.01		−0.09		0.00		+0.01		+0.01		−0.05	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		+0.3		+0.4		+0.3		+0.4		+0.3		+0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ Piscium. Mag. 4.7				ζ Piscium. Mag. 5.6				κ Tucanæ. Mag. 5.0				f Piscium. Mag. 5.3		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decli- tion
	h m 1 6		° ′ +29 38		h m 1 9		° ′ + 7 7		h m 1 12		° ′ −69 19		h m 1 13		° + 3
	s		″		s		″		s		″		s		″
Jan. 0.3	59.04	13	33.6	4	18.04	11	41.0	6	55.45	55	53.1	1	25.56	10	7.2
10.2	58.91	14	33.2	7	17.93	11	40.4	7	54.90	54	53.0	7	25.46	11	6.5
20.2	58.77	14	32.5	10	17.82	11	39.7	6	54.36	51	52.3	13	25.35	11	5.9
30.2	58.63	13	31.5	11	17.71	10	39.1	6	53.85	48	51.0	19	25.24	11	5.3
Feb. 9.2	58.50	12	30.4	13	17.61	10	38.5	6	53.37	44	49.1	23	25.13	10	4.9
19.1	58.38	10	29.1	13	17.51	8	37.9	4	52.93	37	46.8	28	25.03	8	4.5
Mar. 1.1	58.28	7	27.8	14	17.43	5	37.5	3	52.56	30	44.0	31	24.95	6	4.2
11.1	58.21	2	26.4	14	17.38	2	37.2	1	52.26	22	40.9	34	24.89	3	4.1
21.1	58.19	1	25.0	12	17.36	1	37.1	1	52.04	12	37.5	37	24.86	2	4.2
31.0	58.20	7	23.8	10	17.37	6	37.2	3	51.92	3	33.8	37	24.88	5	4.5
Apr. 10.0	58.27	11	22.8	8	17.43	10	37.5	5	51.89	7	30.1	38	24.93	9	5.1
20.0	58.38	17	22.0	4	17.53	14	38.0	8	51.96	17	26.3	38	25.02	13	5.9
29.9	58.55	21	21.6	2	17.67	19	38.8	11	52.13	27	22.5	37	25.15	18	6.9
May 9.9	58.76	25	21.4	2	17.86	22	39.9	13	52.40	36	18.8	35	25.33	22	8.2
19.9	59.01	29	21.6	5	18.08	26	41.2	15	52.76	44	15.3	32	25.55	25	9.6
29.9	59.30	33	22.1	9	18.34	28	42.7	17	53.20	53	12.1	28	25.80	28	11.3
June 8.8	59.63	34	23.0	12	18.62	31	44.4	19	53.73	59	9.3	25	26.08	31	13.2
18.8	59.97	36	24.2	15	18.93	32	46.3	19	54.32	63	6.8	20	26.39	31	15.1
28.8	60.33	36	25.7	17	19.25	32	48.2	20	54.95	66	4.8	15	26.70	32	17.1
July 8.8	60.69	35	27.4	20	19.57	32	50.2	20	55.61	68	3.3	9	27.02	32	19.1
18.7	61.04	34	29.4	21	19.89	32	52.2	19	56.29	67	2.4	3	27.34	31	21.1
28.7	61.38	32	31.5	22	20.21	29	54.1	19	56.96	64	2.1	2	27.65	29	22.9
Aug. 7.7	61.70	30	33.7	23	20.50	27	56.0	16	57.60	59	2.3	9	27.94	27	24.7
17.6	62.00	26	36.0	23	20.77	24	57.6	15	58.19	54	3.2	13	28.21	25	26.2
27.6	62.26	23	38.3	22	21.01	21	59.1	13	58.73	45	4.5	19	28.46	21	27.6
Sept. 6.6	62.49	19	40.5	22	21.22	18	60.4	11	59.18	36	6.4	23	28.67	17	28.7
16.6	62.68	16	42.7	21	21.40	14	61.5	8	59.54	26	8.7	27	28.84	15	29.5
26.5	62.84	12	44.8	19	21.54	10	62.3	6	59.80	15	11.4	29	28.99	11	30.1
Oct. 6.5	62.96	8	46.7	17	21.64	8	62.9	4	59.95	4	14.3	31	29.10	8	30.5
16.5	63.04	5	48.4	15	21.72	5	63.3	2	59.99	7	17.4	30	29.18	5	30.6
26.5	63.09	1	49.9	13	21.77	1	63.5	0	59.92	18	20.4	30	29.23	1	30.6
Nov. 5.4	63.10	1	51.2	11	21.78	1	63.5	2	59.74	27	23.4	27	29.24	0	30.3
15.4	63.09	4	52.3	9	21.77	3	63.3	3	59.47	36	26.1	24	29.24	3	30.0
25.4	63.05	7	53.2	5	21.74	6	63.0	4	59.11	43	28.5	19	29.21	6	29.5
Dec. 5.3	62.98	10	53.7	3	21.68	7	62.6	5	58.68	48	30.4	15	29.15	7	28.9
15.3	62.88	11	54.0	0	21.61	9	62.1	6	58.20	53	31.9	8	29.08	9	28.2
25.3	62.77	12	54.0	3	21.52	10	61.5	6	57.67	54	32.7	3	28.99	10	27.6
35.3	62.65		53.7		21.42		60.9		57.13		33.0		28.89		26.9
Sec δ, Tan δ	1.151		+0.569		1.008		+0.125		2.832		−2.650		1.001		+0.055
Mean Place	$58^{s}.496$		$19''.22$		$17^{s}.333$		$34''.20$		$53^{s}.231$		$39''.52$		$24^{s}.803$		$1''.65$
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		−0.04		0.00		−0.01		−0.02		+0.18		0.00		0.00
$D_\psi \delta$, $D_\omega \delta$	+0.4		+0.3		+0.4		+0.3		+0.4		+0.3		+0.4		+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	υ Piscium. Mag. 4.7				θ Ceti. Mag. 3.8				δ Cassiopeiæ. Mag. 2.8				γ Phœnicis. Mag. 3.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 1 14		° ′ +26 49		h m 1 19		° ′ − 8 36		h m 1 20		° ′ +59 47		h m 1 24		° ′ −43 44	
	s		″		s		″		s		″		s		″	
an. 0.3	48.06	13	17.0	4	47.32	10	76.4	7	15.08	30	61.2	3	41.81	20	81.9	5
10.3	47.93	13	16.6	6	47.22	12	77.1	5	14.78	31	61.5	3	41.61	21	82.4	0
20.2	47.80	14	16.0	9	47.10	12	77.6	3	14.47	32	61.2	8	41.40	21	82.4	4
30.2	47.66	13	15.1	10	46.98	11	77.9	2	14.15	31	60.4	13	41.19	20	82.0	10
eb. 9.2	47.53	12	14.1	12	46.87	11	78.1	1	13.84	28	59.1	17	40.99	18	81.0	14
19.1	47.41	10	12.9	12	46.76	8	78.0	3	13.56	23	57.4	20	40.81	16	79.6	18
lar 1.1	47.31	7	11.7	12	46.68	7	77.7	5	13.33	18	55.4	23	40.65	12	77.8	21
11.1	47.24	3	10.5	12	46.61	3	77.2	8	13.15	11	53.1	24	40.53	9	75.7	25
21.1	47.21	1	9.3	11	46.58	0	76.4	10	13.04	3	50.7	25	40.44	4	73.2	28
31.0	47.22	6	8.2	8	46.58	4	75.4	12	13.01	5	48.2	25	40.40	1	70.4	30
pr. 10.0	47.28	10	7.4	7	46.62	8	74.2	15	13.06	14	45.7	23	40.41	6	67.4	32
20.0	47.38	15	6.7	3	46.70	12	72.7	16	13.20	22	43.4	20	40.47	11	64.2	33
30.0	47.53	20	6.4	1	46.82	17	71.1	19	13.42	30	41.4	17	40.58	17	60.9	33
lay 9.9	47.73	25	6.3	3	46.99	21	69.2	21	13.72	37	39.7	13	40.75	22	57.6	32
19.9	47.98	28	6.6	6	47.20	24	67.1	21	14.09	43	38.4	9	40.97	27	54.4	32
29.9	48.26	31	7.2	10	47.44	28	65.0	22	14.52	49	37.5	4	41.24	31	51.2	29
une 8.8	48.57	33	8.2	12	47.72	29	62.8	22	15.01	52	37.1	0	41.55	34	48.3	27
18.8	48.90	35	9.4	15	48.01	31	60.6	21	15.53	54	37.1	6	41.89	37	45.6	23
28.8	49.25	35	10.9	17	48.32	32	58.5	21	16.07	55	37.7	10	42.26	38	43.3	20
uly 8.8	49.60	35	12.6	19	48.64	32	56.4	19	16.62	55	38.7	14	42.64	39	41.3	16
18.7	49.95	34	14.5	21	48.96	31	54.5	17	17.17	53	40.1	19	43.03	38	39.7	10
28.7	50.29	32	16.6	21	49.27	30	52.8	15	17.70	50	42.0	22	43.41	37	38.7	6
Aug. 7.7	50.61	29	18.7	22	49.57	27	51.3	11	18.20	47	44.2	25	43.78	34	38.1	0
17.7	50.90	27	20.9	22	49.84	25	50.2	9	18.67	42	46.7	28	44.12	31	38.1	5
27.6	51.17	23	23.1	21	50.09	21	49.3	6	19.09	38	49.5	30	44.43	27	38.6	10
Sept. 6.6	51.40	20	25.2	20	50.30	19	48.7	2	19.47	31	52.5	31	44.70	22	39.6	14
16.6	51.60	16	27.2	19	50.49	15	48.5	1	19.78	26	55.6	32	44.92	18	41.0	18
26.5	51.76	12	29.1	17	50.64	11	48.6	3	20.04	20	58.8	32	45.10	12	42.8	22
Oct. 6.5	51.88	9	30.8	16	50.75	8	48.9	6	20.24	13	62.0	31	45.22	8	45.0	23
16.5	51.97	6	32.4	14	50.83	5	49.5	8	20.37	8	65.1	31	45.30	3	47.3	25
26.5	52.03	2	33.8	11	50.88	2	50.3	9	20.45	1	68.2	29	45.33	2	49.8	25
Nov. 5.4	52.05	0	34.9	10	50.90	1	51.2	10	20.46	4	71.1	26	45.31	7	52.3	25
15.4	52.05	4	35.9	7	50.89	3	52.2	11	20.42	11	73.7	23	45.24	10	54.8	23
25.4	52.01	6	36.6	4	50.86	6	53.3	11	20.31	16	76.0	20	45.14	14	57.1	20
Dec. 5.4	51.95	8	37.0	2	50.80	7	54.4	10	20.15	20	78.0	15	45.00	16	59.1	16
15.3	51.87	10	37.2	0	50.73	10	55.4	9	19.95	25	79.5	11	44.84	19	60.7	13
25.3	51.77	12	37.2	3	50.63	10	56.3	8	19.70	28	80.6	5	44.65	20	62.0	8
35.3	51.65		36.9		50.53		57.1		19.42		81.1		44.45		62.8	
Sec δ, Tan δ	1.121		+0.506		1.011		−0.152		1.988		+1.718		1.384		−0.957	
Mean Place	47ˢ.437		3″.41		46ˢ.449		77″.93		14ˢ.640		38″.69		40ˢ.499		73″.17	
D′ψα, Dωα	0.00		−0.03		0.00		+0.01		+0.02		−0.11		−0.01		+0.06	
Dψδ, Dωδ	+0.4		+0.3		+0.4		+0.3		+0.4		+0.3		+0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**38 Cassiopeiæ.** Mag. 6.0				**η Piscium.** Mag. 3.7				**40 Cassiopeiæ.** Mag. 5.5				**υ Andromeda** Mag. 4.2		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Decl tion
	h m		° ′		h m		° ′		h m		° ′		h m		
	1 24		+69 49		1 26		+14 54		1 31		+72 36		1 31		+4
	s		″		s		″		s		″		s		″
Jan. 0.3	53.38	48	64.0	5	56.70	11	38.7	5	42.37	57	51.5	7	48.81	16	68.
10.3	52.90	51	64.5	0	56.59	12	38.2	6	41.80	60	52.2	1	48.65	17	68.
20.2	52.39	51	64.5	6	56.47	12	37.6	7	41.20	61	52.3	5	48.48	19	68.
30.2	51.88	49	63.9	12	56.35	12	36.9	8	40.59	59	51.8	11	48.29	18	67.
Feb. 9.2	51.39	45	62.7	17	56.23	11	36.1	8	40.00	54	50.7	16	48.11	16	66.
19.1	50.94	39	61.0	21	56.12	10	35.3	7	39.46	47	49.1	20	47.95	15	65.
Mar. 1.1	50.55	30	58.9	24	56.02	7	34.6	7	38.99	37	47.1	24	47.80	11	63.
11.1	50.25	20	56.5	26	55.95	4	33.9	5	38.62	26	44.7	26	47.69	6	61.
21.1	50.05	8	53.9	28	55.91	0	33.4	4	38.36	13	42.1	28	47.63	2	60.
31.0	49.97	3	51.1	27	55.91	4	33.0	2	38.23	1	39.3	28	47.61	3	58.
Apr. 10.0	50.00	16	48.4	26	55.95	9	32.8	1	38.24	15	36.5	28	47.64	10	56.
20.0	50.16	28	45.8	25	56.04	13	32.9	3	38.39	29	33.7	25	47.74	15	55.
30.0	50.44	39	43.3	21	56.17	17	33.2	6	38.68	42	31.2	23	47.89	21	54.
May 9.9	50.83	49	41.2	18	56.34	22	33.8	9	39.10	54	28.9	19	48.10	26	53.1
19.9	51.32	58	39.4	13	56.56	25	34.7	11	39.64	64	27.0	14	48.36	31	52.6
29.9	51.90	66	38.1	8	56.81	29	35.8	13	40.28	73	25.6	10	48.67	34	52.4
June 8.8	52.56	70	37.3	3	57.10	31	37.1	16	41.01	79	24.6	5	49.01	37	52.6
18.8	53.26	74	37.0	2	57.41	32	38.7	17	41.80	83	24.1	0	49.38	39	53.2
28.8	54.00	76	37.2	6	57.73	33	40.4	18	42.63	86	24.1	5	49.77	40	54.1
July 8.8	54.76	75	37.8	12	58.06	33	42.2	19	43.49	86	24.6	11	50.17	40	55.4
18.7	55.51	74	39.0	17	58.39	32	44.1	20	44.35	84	25.7	15	50.57	39	57.0
28.7	56.25	70	40.7	21	58.71	31	46.1	19	45.19	80	27.2	19	50.96	37	58.9
Aug. 7.7	56.95	65	42.8	24	59.02	28	48.0	18	45.99	75	29.1	24	51.33	34	61.0
17.7	57.60	59	45.2	28	59.30	26	49.8	17	46.74	69	31.5	27	51.67	32	63.3
27.6	58.19	52	48.0	30	59.56	23	51.5	16	47.43	61	34.2	30	51.99	28	65.6
Sept. 6.6	58.71	45	51.0	33	59.79	19	53.1	15	48.04	53	37.2	32	52.27	25	68.1
16.6	59.16	36	54.3	34	59.98	16	54.6	12	48.57	43	40.4	34	52.52	20	70.6
26.5	59.52	27	57.7	35	60.14	14	55.8	10	49.00	33	43.8	35	52.72	17	73.1
Oct. 6.5	59.79	19	61.2	35	60.28	10	56.8	9	49.33	23	47.3	36	52.89	12	75.5
16.5	59.98	10	64.7	34	60.38	6	57.7	6	49.56	12	50.9	35	53.01	8	77.8
26.5	60.08	0	68.1	32	60.44	4	58.3	5	49.68	1	54.4	33	53.09	5	79.9
Nov. 5.4	60.08	9	71.3	31	60.48	1	58.8	2	49.69	9	57.7	32	53.14	0	81.9
15.4	59.99	18	74.4	27	60.49	2	59.0	1	49.60	20	60.9	29	53.14	3	83.6
25.4	59.81	27	77.1	24	60.47	5	59.1	0	49.40	30	63.8	25	53.11	6	85.1
Dec. 5.4	59.54	34	79.5	20	60.42	6	59.1	2	49.10	39	66.3	21	53.05	10	86.3
15.3	59.20	41	81.5	14	60.36	8	58.9	4	48.71	48	68.4	16	52.95	12	87.1
25.3	58.79	45	82.9	9	60.28	11	58.5	5	48.23	54	70.0	11	52.83	15	87.6
35.3	58.34		83.8		60.17		58.0		47.69		71.1		52.68		87.8
Sec δ, Tan δ	2.901		+2.723		1.035		+0.266		3.346		+3.194		1.325		+0.86
Mean Place	52ˢ.980		39″.72		55ˢ.924		28″.83		41ˢ.838		26″.78		48ˢ.127		50″.71
D′ψ α, Dω α	+0.03		−0.18		0.00		−0.02		+0.03		−0.20		+0.01		−0.05
Dψ δ, Dω δ	+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	**π Piscium.** Mag. 5.6				**υ Persei.** Mag. 3.8				**α Eridani.** (*Achernar.*) Mag. 0.6				**ω Cassiopeiæ.** Mag. 5.5			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 1 32		° ′ +11 42		h m 1 32		° ′ +48 11		h m 1 34		° ′ −57 39		h m 1 35		° ′ +67 36	
	s		″		s		″		s		″		s		″	
n. 0.3	36.22		34.3		46.69		72.7		34.74		77.5		62.25		73.2	
10.3	36.12	10	33.8	5	46.49	20	72.8	1	34.42	32	77.9	4	61.84	41	73.8	6
20.2	36.00	12	33.1	7	46.28	21	72.5	3	34.09	33	77.7	2	61.39	45	73.9	1
30.2	35.88	12	32.5	6	46.06	22	71.7	8	33.76	33	77.0	7	60.93	46	73.4	5
eb. 9.2	35.76	12	31.8	7	45.85	21	70.6	11	33.45	31	75.8	12	60.49	44	72.3	11
19.2	35.65	11	31.2	6	45.65	20	69.2	14	33.16	29	74.0	18	60.08	41	70.8	15
ar. 1.1	35.55	10	30.6	6	45.48	17	67.4	18	32.91	25	71.8	22	59.72	36	68.8	20
11.1	35.48	7	30.1	5	45.34	14	65.5	19	32.70	21	69.2	26	59.43	29	66.5	23
21.1	35.44	4	29.7	4	45.26	8	63.5	20	32.53	17	66.2	30	59.23	20	64.0	25
31.0	35.43	1	29.5	2	45.23	3	61.4	21	32.43	10	63.0	32	59.13	10	61.3	27
pr. 10.0	35.46	3	29.6	1	45.26	3	59.5	19	32.39	4	59.5	35	59.14	1	58.6	27
20.0	35.54	8	29.8	2	45.36	10	57.7	18	32.42	3	55.9	36	59.26	12	56.0	26
30.0	35.66	12	30.3	5	45.53	17	56.1	16	32.52	10	52.3	36	59.49	23	53.6	24
ay 9.9	35.83	17	31.0	7	45.76	23	54.8	13	32.69	17	48.7	36	59.83	34	51.5	21
19.9	36.04	21	32.0	10	46.04	28	53.9	9	32.93	24	45.2	35	60.27	44	49.8	17
29.9	36.28	24	33.3	13	46.38	34	53.4	5	33.23	30	41.8	34	60.79	52	48.4	14
une 8.9	36.56	28	34.7	14	46.76	38	53.3	1	33.59	36	38.7	31	61.37	58	47.6	8
18.8	36.86	30	36.3	16	47.17	41	53.6	3	33.99	40	36.0	27	62.01	64	47.2	4
28.8	37.18	32	38.1	18	47.60	43	54.4	8	34.43	44	33.6	24	62.69	68	47.3	1
uly 8.8	37.50	32	40.0	19	48.04	44	55.5	11	34.90	47	31.7	19	63.39	70	47.9	6
18.7	37.83	33	41.9	19	48.48	44	57.0	15	35.38	48	30.4	13	64.08	69	49.0	11
28.7	38.15	32	43.8	19	48.91	43	58.8	18	35.86	48	29.5	9	64.77	69	50.5	15
ug. 7.7	38.45	30	45.6	18	49.32	41	60.9	21	36.32	46	29.2	3	65.42	65	52.5	20
17.7	38.74	29	47.4	18	49.70	38	63.2	23	36.75	43	29.5	3	66.04	62	54.8	23
27.6	39.00	26	49.0	16	50.05	35	65.7	25	37.15	40	30.4	9	66.60	56	57.4	26
ept. 6.6	39.23	23	50.4	14	50.36	31	68.4	27	37.50	35	31.8	14	67.11	51	60.4	30
16.6	39.43	20	51.7	13	50.64	28	71.1	27	37.79	29	33.6	18	67.54	43	63.5	31
26.6	39.59	16	52.8	11	50.86	22	73.9	28	38.02	23	35.9	23	67.90	36	66.8	33
ct. 6.5	39.73	14	53.6	8	51.04	18	76.6	27	38.18	16	38.5	26	68.19	29	70.2	34
16.5	39.83	10	54.2	6	51.18	14	79.2	26	38.27	9	41.3	28	68.40	21	73.5	33
26.5	39.90	7	54.7	5	51.27	9	81.8	26	38.29	2	44.2	29	68.52	12	76.9	34
Nov. 5.4	39.94	4	54.9	2	51.31	4	84.1	23	38.24	5	47.1	29	68.56	4	80.1	32
15.4	39.96	2	55.0	1	51.31	0	86.2	21	38.12	12	49.9	28	68.51	5	83.1	30
25.4	39.94	2	54.9	1	51.27	4	88.1	19	37.95	17	52.5	26	68.39	12	85.8	27
Dec. 5.4	39.90	4	54.7	2	51.19	8	89.6	15	37.73	22	54.7	22	68.19	20	88.2	24
15.3	39.84	6	54.4	3	51.07	12	90.8	12	37.47	26	56.5	18	67.91	28	90.1	19
25.3	39.76	8	53.9	5	50.92	15	91.6	8	37.18	29	57.8	13	67.57	34	91.6	15
35.3	39.66	10	53.4	5	50.74	18	91.9	3	36.86	32	58.6	8	67.17	40	92.6	10
ec δ, Tan δ	1.021		+0.207		1.500		+1.119		1.869		−1.580		2.626		+2.428	
ean Place	35s.397		25″.42		46s.020		52″.66		32s.979		66″.31		61s.604		49″.20	
Dψ a, Dω a	0.00		−0.01		+0.01		−0.07		−0.02		+0.10		+0.03		−0.15	
Dψ δ, Dω δ	+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ν Piscium. Mag. 4.7				φ Persei. Mag. 4.2				τ Ceti. Mag. 3.6				ο Piscium. Mag. 4.5		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decli- tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	1 37		+ 5 3		1 38		+50 15		1 40		−16 22		1 40		+ 8
	s		″		s		″		s		″		s		″
Jan. 0.3	1.27	11	35.1	6	20.19	20	60.3	2	8.17	12	65.3	8	55.08	11	57.1
10.3	1.16	11	34.5	6	19.99	22	60.5	3	8.05	13	66.1	5	54.97	11	56.5
20.2	1.05	12	33.9	6	19.77	24	60.2	6	7.92	13	66.6	2	54.86	12	55.9
30.2	0.93	12	33.3	5	19.53	23	59.6	11	7.79	14	66.8	0	54.74	12	55.3
Feb. 9.2	0.81	11	32.8	5	19.30	21	58.5	14	7.65	13	66.8	3	54.62	12	54.7
19.2	0.70	10	32.3	3	19.09	19	57.1	17	7.52	11	66.5	6	54.50	10	54.2
Mar. 1.1	0.60	7	32.0	2	18.90	15	55.4	20	7.41	9	65.9	9	54.40	8	53.7
11.1	0.53	5	31.8	0	18.75	10	53.4	21	7.32	6	65.0	12	54.32	5	53.4
21.1	0.48	1	31.8	2	18.65	4	51.3	21	7.26	3	63.8	14	54.27	1	53.2
31.0	0.47	3	32.0	4	18.61	3	49.2	20	7.23	1	62.4	17	54.26	2	53.2
Apr. 10.0	0.50	7	32.4	7	18.64	9	47.2	19	7.24	6	60.7	19	54.28	7	53.4
20.0	0.57	11	33.1	8	18.73	16	45.3	17	7.30	10	58.8	21	54.35	12	53.8
30.0	0.68	16	33.9	12	18.89	23	43.6	14	7.40	14	56.7	23	54.47	15	54.4
May 9.9	0.84	20	35.1	13	19.12	29	42.2	10	7.54	18	54.4	23	54.62	20	55.3
19.9	1.04	24	36.4	15	19.41	34	41.2	7	7.72	23	52.1	25	54.82	24	56.4
29.9	1.28	27	37.9	17	19.75	39	40.5	2	7.95	26	49.6	25	55.06	27	57.8
June 8.9	1.55	29	39.6	18	20.14	42	40.3	2	8.21	28	47.1	24	55.33	29	59.3
18.8	1.84	31	41.4	19	20.56	44	40.5	6	8.49	30	44.7	23	55.62	31	61.0
28.8	2.15	32	43.3	20	21.00	46	41.1	10	8.79	32	42.4	22	55.93	33	62.8
July 8.8	2.47	32	45.3	19	21.46	45	42.1	14	9.11	32	40.2	19	56.26	32	64.7
18.7	2.79	31	47.2	18	21.91	45	43.5	17	9.43	32	38.3	17	56.58	32	66.6
28.7	3.10	30	49.0	18	22.36	43	45.2	21	9.75	30	36.6	14	56.90	30	68.5
Aug. 7.7	3.40	28	50.8	16	22.79	40	47.3	23	10.05	28	35.2	10	57.20	29	70.2
17.7	3.68	26	52.4	14	23.19	37	49.6	25	10.33	26	34.2	6	57.49	26	71.9
27.6	3.94	23	53.8	11	23.56	33	52.1	26	10.59	24	33.6	3	57.75	24	73.4
Sept. 6.6	4.17	20	54.9	9	23.89	29	54.7	28	10.83	20	33.3	1	57.99	20	74.7
16.6	4.37	17	55.8	7	24.18	24	57.5	28	11.03	16	33.4	5	58.19	17	75.8
26.6	4.54	14	56.5	5	24.42	19	60.3	27	11.19	13	33.9	8	58.36	15	76.7
Oct. 6.5	4.68	10	57.0	2	24.61	15	63.0	28	11.32	10	34.7	10	58.51	11	77.4
16.5	4.78	7	57.2	0	24.76	10	65.8	26	11.42	6	35.7	12	58.62	7	77.8
26.5	4.85	4	57.2	2	24.86	5	68.4	24	11.48	3	36.9	14	58.69	5	78.0
Nov. 5.4	4.89	2	57.0	3	24.91	1	70.8	23	11.51	0	38.3	14	58.74	2	78.1
15.4	4.91	1	56.7	4	24.92	3	73.1	19	11.51	3	39.7	15	58.76	1	78.0
25.4	4.90	4	56.3	5	24.89	9	75.0	17	11.48	6	41.2	14	58.75	3	77.7
Dec. 5.4	4.86	6	55.8	6	24.80	12	76.7	13	11.42	7	42.6	13	58.72	5	77.4
15.3	4.80	8	55.2	6	24.68	16	78.0	9	11.35	10	43.9	11	58.67	8	76.9
25.3	4.72	9	54.6	7	24.52	19	78.9	5	11.25	12	45.0	9	58.59	9	76.4
35.3	4.63		53.9		24.33		79.4		11.13		45.9		58.50		75.8
Sec δ, Tan δ	1.004		+0.089		1.564		+1.203		1.042		−0.294		1.012		+0.154
Mean Place	$0^{s}.378$		$28''.40$		$19^{s}.473$		$39''.68$		$7^{s}.122$		$64''.87$		$54^{s}.186$		$49''.10$
$D'_\psi a$, $D_\omega a$	0.00		−0.01		+0.01		−0.07		0.00		+0.02		0.00		−0.01
$D'_\psi \delta$, $D_\omega \delta$	+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**ε Sculptoris.** Mag. 5.4				**ζ Ceti.** Mag. 3.9				**α Trianguli.** Mag. 3.6				**ε Cassiopeiæ.** Mag. 3.4			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 1 41		° ′ −25 28		h m 1 47		° ′ −10 44		h m 1 48		° ′ +29 9		h m 1 48		° ′ +63 15	
	s		″		s		″		s		″		s		″	
an. 0.3	40.83		40.2		16.91		74.6		14.78		69.7		16.77		30.8	
10.3	40.70	13	41.0	8	16.80	11	75.4	8	14.66	12	69.5	2	16.45	32	31.5	7
20.2	40.55	15	41.4	4	16.68	12	75.9	5	14.52	14	69.1	4	16.09	36	31.6	1
30.2	40.40	15	41.5	1	16.55	13	76.3	4	14.37	15	68.4	7	15.72	37	31.2	4
eb. 9.2	40.25	15	41.2	3	16 42	13	76.5	2	14.22	15	67.5	9	15.35	37	30.3	9
19.2	40.11	14	40.7	5	16.30	12	76.4	1	14.08	14	66.5	10	15.00	35	28.9	14
ar. 1.1	39.99	12	39.7	10	16.19	11	76.1	3	13.95	13	65.3	12	14.69	31	27.1	18
11.1	39.89	10	38.4	13	16.10	9	75.5	6	13.85	10	64.1	12	14.44	25	24.9	22
21.1	39.82	7	36.8	16	16.04	6	74.7	8	13.79	6	62.9	12	14.26	18	22.6	23
31.1	39.78	4	34.9	19	16.01	3	73.6	11	13.76	3	61.8	11	14.16	10	20.1	25
pr. 10.0	39.79	1	32.8	21	16.03	2	72.3	13	13.78	2	60.8	10	14.16	0	17.5	26
20.0	39.84	5	30.5	23	16.08	5	70.8	15	13.85	7	59.9	9	14.24	8	15.1	24
30.0	39.94	10	27.9	26	16.18	10	69.0	18	13.97	12	59.3	6	14.43	19	12.8	23
ay 9.9	40.08	14	25.3	26	16.32	14	67.0	20	14.14	17	59.0	3	14.71	28	10.8	20
19.9	40.27	19	22.6	27	16.50	18	64.9	21	14.36	22	59.0	0	15.07	36	9.1	17
29.9	40.50	23	19.8	28	16.72	22	62.7	22	14.62	26	59.3	3	15.50	43	7.8	13
une 8.9	40.76	26	17.1	27	16.98	26	60.5	22	14.92	30	59.9	6	16.00	50	6.9	9
18.8	41.06	30	14.5	26	17.26	28	58.2	23	15.24	32	60.8	9	16.55	55	6.5	4
28.8	41.37	31	12.1	24	17.56	30	56.0	22	15.58	34	62.0	12	17.13	58	6.6	1
uly 8.8	41.70	33	9.9	22	17.88	32	53.9	21	15.94	36	63.4	14	17.74	61	7.2	6
18.8	42.04	34	8.0	19	18.20	32	51.9	20	16.30	36	65.1	17	18.35	61	8.2	10
28.7	42.37	33	6.5	15	18.51	31	50.2	17	16.65	35	66.9	18	18.95	60	9.7	15
ug. 7.7	42.68	31	5.4	11	18.81	30	48.7	15	16.99	34	68.8	19	19.53	58	11.5	18
17.7	42.98	30	4.7	7	19.10	29	47.6	11	17.31	32	70.8	20	20.08	55	13.7	22
27.6	43.26	28	4.4	3	19.37	27	46.7	9	17.61	30	72.8	20	20.58	50	16.2	25
Sept. 6.6	43.50	24	4.6	2	19.60	23	46.3	4	17.87	26	74.8	20	21.04	46	18.9	27
16.6	43.71	21	5.1	5	19.81	21	46.1	2	18.11	24	76.8	20	21.45	41	21.9	30
26.6	43.89	18	6.0	9	19.98	17	46.3	2	18.31	20	78.6	18	21.79	34	25.0	31
Oct. 6.5	44.02	13	7.3	13	20.12	14	46.7	4	18.48	17	80.4	18	22.07	28	28.2	32
16.5	44.12	10	8.8	15	20.23	11	47.5	8	18.61	13	82.0	16	22.28	21	31.4	32
26.5	44.19	7	10.6	18	20.31	8	48.4	9	18.70	9	83.5	15	22.42	14	34.5	31
Nov. 5.5	44.21	2	12.4	18	20.35	4	49.5	11	18.77	7	84.8	13	22.50	8	37.6	31
15.4	44.20	1	14.3	19	20.36	1	50.7	12	18.80	3	85.8	10	22.50	0	40.4	28
25.4	44.17	3	16.2	19	20.35	1	52.0	13	18.80	0	86.7	9	22.43	7	43.0	26
Dec. 5.4	44.10	7	17.9	17	20.31	4	53.2	12	18.77	3	87.4	7	22.30	13	45.3	23
15.3	44.01	9	19.4	15	20.25	6	54.4	12	18.71	6	87.8	4	22.10	20	47.2	19
25.3	43.90	11	20.7	13	20.17	8	55.5	11	18.62	9	88.0	2	21.85	25	48.7	15
35.3	43.77	13	21.7	10	20.06	11	56.4	9	18.51	11	87.9	1	21.54	31	49.6	9
ec δ, Tan δ	1.108		−0.476		1.018		−0.190		1.145		+0.558		2.222		+1.985	
Mean Place	39ˢ.682		36″.93		15ˢ.863		76″.15		13ˢ.918		54″.88		15ˢ.916		7″.54	
Dψ α, Dω α	−0.01		+0.03		0.00		+0.01		+0.01		−0.03		+0.02		−0.12	
Dψ δ, Dω δ	+0.4		+0.4		+0.4		+0.5		+0.4		+0.5		+0.4		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ξ Piscium. Mag. 4.8				β Arietis. Mag. 2.7				ψ Phœnicis. Mag. 4.4				υ Ceti. Mag. 4.2		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decli tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	1 49		+ 2 46		1 49		+20 23		1 50		−46 42		1 55		−21
	s		″		s		″		s		″		s		
Jan. 0.3	10.19	10	12.2	6	57.34	11	46.8	4	15.73	22	76.6	8	61.15	12	82.
10.3	10.09	12	11.6	6	57.23	12	46.4	5	15.51	24	77.4	2	61.03	14	83.6
20.2	9.97	12	11.0	6	57.11	13	45.9	7	15.27	24	77.6	3	60.89	15	84.2
30.2	9.85	12	10.4	4	56.98	14	45.2	7	15.03	23	77.3	7	60.74	14	84.5
Feb. 9.2	9.73	12	10.0	4	56.84	13	44.5	9	14.80	22	76.6	13	60.60	14	84.4
19.2	9.61	11	9.6	2	56.71	11	43.6	8	14.58	20	75.3	17	60.46	13	84.0
Mar. 1.1	9.50	8	9.4	1	56.60	9	42.8	9	14.38	17	73.6	21	60.33	11	83.3
11.1	9.42	6	9.3	1	56.51	6	41.9	8	14.21	13	71.5	24	60.22	8	82.3
21.1	9.36	2	9.4	3	56.45	3	41.1	7	14.08	9	69.1	28	60.14	4	80.9
31.1	9.34	1	9.7	5	56.42	2	40.4	5	13.99	4	66.3	31	60.10	1	79.3
Apr. 10.0	9.35	6	10.2	8	56.44	6	39.9	3	13.95	2	63.2	32	60.09	4	77.4
20.0	9.41	10	11.0	10	56.50	11	39.6	1	13.97	8	60.0	33	60.13	8	75.3
30.0	9.51	15	12.0	12	56.61	16	39.5	2	14.05	13	56.7	34	60.21	13	73.0
May 9.9	9.66	19	13.2	14	56.77	21	39.7	5	14.18	19	53.3	34	60.34	17	70.5
19.9	9.85	22	14.6	16	56.98	24	40.2	7	14.37	24	49.9	33	60.51	22	67.9
29.9	10.07	26	16.2	18	57.22	28	40.9	10	14.61	29	46.6	31	60.73	25	65.3
June 8.9	10.33	29	18.0	19	57.50	31	41.9	12	14.90	33	43.5	29	60.98	28	62.7
18.8	10.62	30	19.9	19	57.81	32	43.1	15	15.23	37	40.6	25	61.26	30	60.1
28.8	10.92	32	21.8	20	58.13	34	44.6	16	15.60	38	38.1	22	61.56	32	57.7
July 8.8	11.24	32	23.8	19	58.47	34	46.2	18	15.98	39	35.9	17	61.88	33	55.5
18.8	11.56	31	25.7	18	58.81	33	48.0	18	16.37	40	34.2	12	62.21	32	53.6
28.7	11.87	31	27.5	17	59.14	32	49.8	18	16.77	38	33.0	8	62.53	32	51.9
Aug. 7.7	12.18	28	29.2	15	59.46	30	51.6	19	17.15	37	32.2	1	62.85	30	50.6
17.7	12.46	27	30.7	13	59.76	28	53.5	18	17.52	34	32.1	4	63.15	27	49.7
27.6	12.73	23	32.0	10	60.04	26	55.3	17	17.86	31	32.5	9	63.42	25	49.3
Sept. 6.6	12.96	21	33.0	8	60.30	22	57.0	16	18.17	26	33.4	14	63.67	22	49.2
16.6	13.17	18	33.8	6	60.52	19	58.6	14	18.43	21	34.8	18	63.89	19	49.5
26.6	13.35	15	34.4	2	60.71	16	60.0	13	18.64	16	36.6	22	64.08	15	50.2
Oct. 6.5	13.50	11	34.6	1	60.87	13	61.3	12	18.80	11	38.8	25	64.23	11	51.3
16.5	13.61	8	34.7	2	61.00	9	62.5	9	18.91	5	41.3	27	64.34	8	52.6
26.5	13.69	6	34.5	3	61.09	6	63.4	7	18.96	1	44.0	27	64.42	5	54.2
Nov. 5.5	13.75	2	34.2	4	61.15	4	64.1	6	18.97	4	46.7	26	64.47	1	55.9
15.4	13.77	0	33.8	6	61.19	0	64.7	4	18.93	9	49.3	25	64.48	2	57.6
25.4	13.77	3	33.2	7	61.19	3	65.1	2	18.84	13	51.8	23	64.46	4	59.4
Dec. 5.4	13.74	5	32.5	7	61.16	5	65.3	1	18.71	17	54.1	20	64.42	8	61.1
15.3	13.69	7	31.8	7	61.11	7	65.4	2	18.54	19	56.1	15	64.34	10	62.6
25.3	13.62	9	31.1	6	61.04	10	65.2	3	18.35	21	57.6	11	64.24	11	63.9
35.3	13.53		30.5		60.94		64.9		18.14		58.7		64.13		65.0
Sec δ, Tan δ	1.001		+0.048		1.067		+0.372		1.458		−1.062		1.075		−0.394
Mean Place	9ˢ.215		6″.08		56ˢ.440		34″.70		14ˢ.194		68″.20		59ˢ.966		81″.17
D′ψ α, Dω α	0.00		0.00		0.00		−0.02		−0.01		+0.06		−0.01		+0.02
ψ δ, Dω δ	+0.4		+0.5		+0.4		+0.5		+0.4		+0.5		+0.3		+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

n Solar ate.	**α Hydri.** Mag. 3.0				**50 Cassiopeiæ.** Mag. 4.1				**γ Andromedæ *pr*.** Mag. 2.3				**α Arietis.** Mag. 2.2			
	Right Ascension.		**Declination S.**		**Right Ascension.**		**Declination N.**		**Right Ascension.**		**Declination N.**		**Right Ascension.**		**Declination N.**	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 56		−61 58		1 56		+72 0		1 58		+41 55		2 2		+23 3	
	s		″		s		″		s		″		s		″	
1. 0.3	7.22		70.4		10.03		62.9		41.45		39.2		23.65		52.8	
10.3	6.84	38	71.0	6	9.51	52	63.9	10	41.30	15	39.4	2	23.54	11	52.5	3
20.3	6.44	40	71.0	0	8.94	57	64.4	5	41.12	18	39.2	2	23.42	12	52.1	4
30.2	6.03	41	70.5	5	8.35	59	64.2	2	40.93	19	38.7	5	23.29	13	51.5	6
b. 9.2	5.64	39	69.4	11	7.77	58	63.4	8	40.74	19	37.8	9	23.14	15	50.8	7
19.2	5.27	37	67.7	17	7.22	55	62.1	13	40.56	18	36.7	11	23.00	14	49.9	9
ır. 1.1	4.93	34	65.6	21	6.73	49	60.4	17	40.39	17	35.3	14	22.88	12	49.0	9
11.1	4.64	29	63.1	25	6.31	42	58.2	22	40.25	14	33.7	16	22.78	10	48.1	9
21.1	4.40	24	60.2	29	6.00	31	55.7	25	40.16	9	32.0	17	22.70	8	47.2	9
31.1	4.23	17	57.0	32	5.81	19	53.0	27	40.11	5	30.3	17	22.66	4	46.4	8
pr. 10.0	4.12	11	53.5	35	5.75	6	50.3	27	40.11	0	28.7	16	22.67	1	45.7	7
20.0	4.10	2	49.9	36	5.83	8	47.5	28	40.17	6	27.1	16	22.72	5	45.3	4
30.0	4.15	5	46.2	37	6.04	21	44.9	26	40.29	12	25.8	13	22.82	10	45.0	3
ay 10.0	4.28	13	42.5	37	6.39	35	42.6	23	40.47	18	24.8	10	22.98	16	45.0	0
19.9	4.49	21	38.9	36	6.85	46	40.5	21	40.71	24	24.0	8	23.17	19	45.2	2
29.9	4.78	29	35.4	35	7.43	58	38.8	17	41.00	29	23.6	4	23.41	24	45.8	6
ne 8.9	5.13	35	32.2	32	8.10	67	37.5	13	41.33	33	23.5	1	23.69	28	46.6	8
18.8	5.54	41	29.3	29	8.84	74	36.8	7	41.69	36	23.9	4	23.99	30	47.6	10
28.8	6.00	46	26.7	26	9.64	80	36.5	3	42.08	39	24.6	7	24.31	32	48.9	13
ly 8.8	6.50	50	24.7	20	10.47	83	36.7	2	42.48	40	25.6	10	24.65	34	50.4	15
18.8	7.02	52	23.1	16	11.31	84	37.4	7	42.88	40	26.9	13	25.00	35	52.0	16
28.7	7.54	52	22.1	10	12.15	84	38.6	12	43.28	40	28.5	16	25.34	34	53.7	17
ug. 7.7	8.06	52	21.7	4	12.97	82	40.2	16	43.67	39	30.3	18	25.67	33	55.5	18
17.7	8.56	50	21.9	2	13.74	77	42.3	21	44.04	37	32.3	20	25.99	32	57.4	19
27.7	9.02	46	22.6	7	14.46	72	44.7	24	44.39	35	34.5	22	26.28	29	59.2	18
ept. 6.6	9.43	41	24.0	14	15.12	66	47.4	27	44.70	31	36.8	23	26.54	26	60.9	17
16.6	9.79	36	25.8	18	15.70	58	50.4	30	44.98	28	39.2	24	26.78	24	62.6	17
26.6	10.07	28	28.1	23	16.20	50	53.6	32	45.22	24	41.6	24	26.99	21	64.1	15
ct. 6.5	10.28	21	30.7	26	16.61	41	57.0	34	45.43	21	43.9	23	27.16	17	65.5	14
16.5	10.42	14	33.6	29	16.92	31	60.4	34	45.59	16	46.1	22	27.30	14	66.7	12
26.5	10.47	5	36.7	31	17.13	21	63.8	34	45.71	12	48.3	22	27.41	11	67.8	11
ov. 5.5	10.44	3	39.7	30	17.23	10	67.2	34	45.80	9	50.3	20	27.49	8	68.7	9
15.4	10.33	11	42.7	30	17.22	1	70.4	32	45.84	4	52.1	18	27.54	5	69.4	7
25.4	10.16	17	45.5	28	17.11	11	73.4	30	45.84	0	53.7	16	27.55	1	69.9	5
Dec. 5.4	9.92	24	47.9	24	16.89	22	76.0	26	45.81	3	55.1	14	27.54	1	70.3	4
15.4	9.62	30	50.0	21	16.58	31	78.3	23	45.74	7	56.1	10	27.49	5	70.5	2
25.3	9.28	34	51.5	15	16.18	40	80.2	19	45.63	11	56.8	7	27.42	7	70.5	0
35.3	8.91	37	52.5	10	15.69	49	81.5	13	45.49	14	57.2	4	27.33	9	70.3	2
ec δ, Tan δ	2.129		−1.879		3.239		+3.081		1.344		+0.898		1.087		+0.426	
ean Place	5^s.081		59″.49		8^s.901		38″.42		40^s.520		20″.73		22^s.676		39″.78	
$_\psi\alpha$, $D_\omega\alpha$	−0.02		+0.11		+0.04		−0.18		+0.01		−0.05		+0.01		−0.02	
$_\psi\delta$, $D_\omega\delta$	+0.3		+0.5		+0.3		+0.5		+0.3		+0.5		+0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*β* Trianguli.				55 Cassiopeiæ.				6 Persei.				ξ^1 Ceti.		
	Mag. 3.1				Mag. 6.2				Mag. 5.4				Mag. 4.5		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		De ti
	h m		° ′		h m		° ′		h m		° ′		h m		
	2 4		+34 35		2 7		+66 7		2 7		+50 40		2 8		+
	s		″		s		″		s		″		s		
Jan. 0.3	29.82		25.3		48.84		59.8		57.66		38.2		30.61		61
10.3	29.69	13	25.3	0	48.48	36	60.8	10	57.47	19	38.7	5	30.51	10	61
20.3	29.55	14	25.0	3	48.08	40	61.2	4	57.25	22	38.8	1	30.40	11	61
30.2	29.39	16	24.5	5	47.66	42	61.1	1	57.02	23	38.4	4	30.28	12	60
Feb. 9.2	29.22	17	23.7	8	47.24	42	60.4	7	56.77	25	37.7	7	30.15	13	6
19.2	29.05	17	22.7	10	46.83	41	59.2	12	56.54	23	36.5	12	30.02	13	59
Mar. 1.1	28.91	14	21.5	12	46.45	38	57.6	16	56.33	21	35.0	15	29.90	12	59
11.1	28.78	13	20.2	13	46.13	32	55.6	20	56.15	18	33.3	17	29.80	10	59
21.1	28.69	9	18.8	14	45.89	24	53.3	23	56.01	14	31.4	19	29.73	7	58.9
31.1	28.65	4	17.4	14	45.73	16	50.8	25	55.93	8	29.3	21	29.69	4	58.9
Apr. 10.0	28.65	0	16.1	13	45.67	6	48.2	26	55.91	2	27.3	20	29.69	0	59.1
20.0	28.70	5	15.0	11	45.72	5	45.7	25	55.97	6	25.4	19	29.73	4	59.4
30.0	28.81	11	14.1	9	45.87	15	43.3	24	56.09	12	23.6	18	29.82	9	60.0
May 10.0	28.97	16	13.4	7	46.13	26	41.0	23	56.28	19	22.0	16	29.95	13	60.8
19.9	29.18	21	13.0	4	46.49	36	39.1	19	56.54	26	20.8	12	30.12	17	61.9
29.9	29.44	26	12.9	1	46.93	44	37.5	16	56.85	31	19.9	9	30.34	22	63.2
June 8.9	29.74	30	13.2	3	47.45	52	36.4	11	57.21	36	19.3	6	30.59	25	64.6
18.8	30.07	33	13.7	5	48.03	58	35.7	7	57.62	41	19.2	1	30.87	28	66.3
28.8	30.43	36	14.6	9	48.66	63	35.4	3	58.06	44	19.5	3	31.17	30	68.0
July 8.8	30.80	37	15.8	12	49.31	65	35.6	2	58.51	45	20.1	6	31.48	31	69.8
18.8	31.17	37	17.2	14	49.98	67	36.3	7	58.97	46	21.1	10	31.81	33	71.6
28.7	31.54	37	18.8	16	50.65	67	37.4	11	59.43	46	22.5	14	32.13	32	73.3
Aug. 7.7	31.91	37	20.6	18	51.30	65	39.0	16	59.88	45	24.2	17	32.44	31	75.0
17.7	32.25	34	22.6	20	51.93	63	40.9	19	60.31	43	26.2	20	32.73	29	76.6
27.7	32.58	33	24.6	20	52.51	58	43.2	23	60.71	40	28.4	22	33.01	28	78.0
Sept. 6.6	32.87	29	26.6	20	53.05	54	45.7	25	61.08	37	30.8	24	33.26	25	79.3
16.6	33.13	26	28.7	21	53.54	49	48.5	28	61.41	33	33.3	25	33.49	23	80.3
26.6	33.36	23	30.7	20	53.96	42	51.5	30	61.70	29	35.9	26	33.69	20	81.1
Oct. 6.5	33.56	20	32.7	20	54.31	35	54.7	32	61.95	25	38.5	26	33.86	17	81.7
16.5	33.72	16	34.6	19	54.59	28	57.9	32	62.15	20	41.1	26	33.99	13	82.0
26.5	33.84	12	36.3	17	54.80	21	61.1	32	62.30	15	43.7	26	34.10	11	82.2
Nov. 5.5	33.93	9	37.9	16	54.92	12	64.2	31	62.41	11	46.1	24	34.18	8	82.2
15.4	33.98	5	39.3	14	54.97	5	67.2	30	62.46	5	48.4	23	34.22	4	82.0
25.4	33.99	1	40.5	12	54.93	4	70.0	28	62.47	1	50.5	21	34.24	2	81.7
Dec. 5.4	33.97	2	41.5	10	54.82	11	72.5	25	62.43	4	52.3	18	34.23	1	81.3
15.4	33.92	5	42.2	7	54.63	19	74.7	22	62.34	9	53.8	15	34.19	4	80.8
25.3	33.84	8	42.7	5	54.37	26	76.4	17	62.21	13	55.0	12	34.13	6	80.3
35.3	33.73	11	42.9	2	54.04	33	77.7	13	62.04	17	55.7	7	34.05	8	79.7
Sec δ, Tan δ	1.215		+0.690		2.471		+2.260		1.578		+1.221		1.011		+0.14
Mean Place	$28^{s}.842$		$8''.76$		$47^{s}.612$		$36''.26$		$56^{s}.608$		$17''.60$		$29^{s}.556$		$54''.17$
$D'_{\psi} a$, $D_{\omega} a$	+0.01		−0.04		+0.03		−0.13		+0.02		−0.07		0.00		−0.01
$_{\psi} \delta$, $D_{\omega} \delta$	+0.3		+0.5		+0.3		+0.5		+0.3		+0.5		+0.3		+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	**μ Fornacis.** Mag. 5.2				**γ Trianguli.** Mag. 4.1				**67 Ceti.** Mag. 5.7				**φ Eridani.** Mag. 3.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	2 9		−31 6		2 12		+33 27		2 12		− 6 48		2 13		−51 53	
	s		″		s		″		s		″		s		″	
n. 0.3	10.99	15	84.8	10	16.41	12	32.9	0	45.71	10	44.9	8	30.10	26	87.7	10
10.3	10.84	16	85.8	6	16.29	14	32.9	2	45.61	12	45.7	7	29.84	28	88.7	5
20.3	10.68	17	86.4	2	16.15	16	32.7	5	45.49	13	46.4	5	29.56	29	89.2	1
30.2	10.51	18	86.6	2	15.99	17	32.2	7	45.36	13	46.9	3	29.27	28	89.1	7
eb. 9.2	10.33	17	86.4	6	15.82	16	31.5	10	45.23	13	47.2	2	28.99	28	88.4	11
19.2	10.16	15	85.8	10	15.66	15	30.5	11	45.10	13	47.4	1	28.71	26	87.3	16
ar. 1.2	10.01	14	84.8	14	15.51	13	29.4	12	44.97	10	47.3	4	28.45	23	85.7	21
11.1	9.87	11	83.4	17	15.38	9	28.2	13	44.87	8	46.9	5	28.22	19	83.6	25
21.1	9.76	7	81.7	20	15.29	6	26.9	13	44.79	5	46.4	8	28.03	14	81.1	28
31.1	9.69	3	79.7	23	15.23	0	25.6	12	44.74	2	45.6	11	27.89	9	78.3	31
pr. 10.0	9.66	1	77.4	26	15.23	4	24.4	11	44.72	3	44.5	13	27.80	3	75.2	33
20.0	9.67	6	74.8	27	15.27	10	23.3	9	44.75	8	43.2	15	27.77	3	71.9	35
30.0	9.73	11	72.1	29	15.37	15	22.4	6	44.83	12	41.7	16	27.80	10	68.4	35
ay 10.0	9.84	16	69.2	29	15.52	20	21.8	4	44.95	16	40.1	19	27.90	16	64.9	35
19.9	10.00	20	66.3	30	15.72	25	21.4	1	45.11	20	38.2	20	28.06	22	61.4	35
29.9	10.20	25	63.3	29	15.97	29	21.3	3	45.31	24	36.2	21	28.28	28	57.9	33
une 8.9	10.45	28	60.4	28	16.26	33	21.6	6	45.55	27	34.1	22	28.56	33	54.6	30
18.9	10.73	31	57.6	26	16.59	35	22.2	8	45.82	29	31.9	21	28.89	36	51.6	27
28.8	11.04	32	55.0	23	16.94	36	23.0	11	46.11	30	29.8	21	29.25	40	48.9	23
uly 8.8	11.36	34	52.7	20	17.30	37	24.1	14	46.41	32	27.7	19	29.65	42	46.6	19
18.8	11.70	34	50.7	16	17.67	37	25.5	16	46.73	31	25.8	18	30.07	42	44.7	14
28.7	12.04	33	49.1	12	18.04	36	27.1	17	47.04	31	24.0	15	30.49	42	43.3	8
ug. 7.7	12.37	32	47.9	7	18.40	34	28.8	19	47.35	29	22.5	13	30.91	40	42.5	2
17.7	12.69	30	47.2	2	18.74	33	30.7	19	47.64	28	21.2	10	31.31	39	42.3	3
27.7	12.99	27	47.0	2	19.07	30	32.6	20	47.92	25	20.2	7	31.70	34	42.6	9
ept. 6.6	13.26	24	47.2	7	19.37	26	34.6	19	48.17	22	19.5	3	32.04	31	43.5	14
16.6	13.50	21	47.9	12	19.63	24	36.5	20	48.39	20	19.2	0	32.35	26	44.9	19
26.6	13.71	17	49.1	15	19.87	20	38.5	19	48.59	17	19.2	2	32.61	20	46.8	23
ct. 6.6	13.88	13	50.6	18	20.07	17	40.4	18	48.76	13	19.4	6	32.81	15	49.1	26
16.5	14.01	8	52.4	20	20.24	13	42.2	16	48.89	10	20.0	8	32.96	8	51.7	28
26.5	14.09	5	54.4	22	20.37	9	43.8	15	48.99	8	20.8	9	33.04	3	54.5	30
Nov. 5.5	14.14	2	56.6	23	20.46	6	45.3	13	49.07	4	21.7	11	33.07	3	57.5	29
15.4	14.16	3	58.9	22	20.52	3	46.6	12	49.11	1	22.8	11	33.04	8	60.4	28
25.4	14.13	6	61.1	20	20.55	1	47.8	9	49.12	1	23.9	12	32.96	13	63.2	25
Dec. 5.4	14.07	8	63.1	19	20.54	4	48.7	7	49.11	5	25.1	11	32.83	18	65.7	22
15.4	13.99	11	65.0	16	20.50	8	49.4	5	49.06	6	26.2	10	32.65	21	67.9	18
25.3	13.88	14	66.6	13	20.42	11	49.9	2	49.00	9	27.2	10	32.44	25	69.7	14
35.3	13.74		67.9		20.31		50.1		48.91		28.2		32.19		71.1	
ec δ, Tan δ	1.168		−0.604		1.199		+0.661		1.007		−0.119		1.621		−1.275	
ean Place	9ˢ.631		80″.88		15ˢ.373		16″.74		44ˢ.552		48″.36		28ˢ.273		79″.30	
$_\psi\alpha$, $D_\omega\alpha$	−0.01		+0.03		+0.01		−0.04		0.00		+0.01		−0.02		+0.07	
$D_\psi\delta$, $D_\omega\delta$	+0.3		+0.5		+0.3		+0.5		+0.3		+0.5		+0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	o Ceti. (*Mira.*) Var. 1.7–9.6				**κ Fornacis.** Mag. 5.4				**δ Hydri.** Mag. 4.3				**ι Cassiopeiæ.** Mag. 4.6		
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Decli- tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	2 15		− 3 21		2 18		−24 11		2 20		−69 2		2 22		+67
	s		″		s		″		s		″		s		″
Jan. 0.3	4.24		42.1		40.48		69.8		16.82		55.8		4.22		39.3
10.3	4.14	10	42.9	8	40.35	13	70.8	10	16.28	54	56.6	8	3.86	36	40.5
20.3	4.03	11	43.5	6	40.21	14	71.5	7	15.71	57	56.9	3	3.45	41	41.1
30.2	3.90	13	44.1	6	40.06	15	71.9	4	15.13	58	56.6	3	3.01	44	41.1
Feb. 9.2	3.77	13	44.5	4	39.90	16	71.9	0	14.56	57	55.7	9	2.57	44	40.7
19.2	3.64	13	44.7	2	39.74	16	71.6	3	14.00	56	54.2	15	2.13	44	39.7
Mar. 1.2	3.52	12	44.7	0	39.59	15	70.9	7	13.48	52	52.2	20	1.72	41	38.2
11.1	3.41	11	44.5	2	39.46	13	69.9	10	13.02	46	49.7	25	1.37	35	36.3
21.1	3.33	8	44.1	4	39.36	10	68.5	14	12.62	40	46.9	28	1.08	29	34.1
31.1	3.28	5	43.5	6	39.28	8	66.8	17	12.29	33	43.7	32	0.89	19	31.7
Apr. 10.0	3.27	1	42.7	8	39.25	3	64.9	19	12.06	23	40.3	34	0.80	9	29.1
20.0	3.30	3	41.6	11	39.26	1	62.7	22	11.93	13	36.6	37	0.81	1	26.6
30.0	3.37	7	40.3	13	39.32	6	60.3	24	11.89	4	32.9	37	0.94	13	24.1
May 10.0	3.49	12	38.8	15	39.42	10	57.8	25	11.96	7	29.1	38	1.17	23	21.7
19.9	3.65	16	37.2	16	39.57	15	55.1	27	12.13	17	25.4	37	1.51	34	19.7
29.9	3.85	20	35.3	19	39.77	20	52.4	27	12.40	27	21.9	35	1.94	43	18.0
June 8.9	4.09	24	33.4	19	40.00	23	49.6	28	12.77	37	18.5	34	2.45	51	16.6
18.9	4.35	26	31.4	20	40.27	27	47.0	26	13.22	45	15.5	30	3.04	59	15.7
28.8	4.64	29	29.3	21	40.56	29	44.5	25	13.74	52	12.8	27	3.67	63	15.2
July 8.8	4.95	31	27.3	20	40.87	31	42.2	23	14.32	58	10.6	22	4.34	67	15.3
18.8	5.26	31	25.4	19	41.20	33	40.1	21	14.94	62	8.9	17	5.03	69	15.7
28.7	5.58	32	23.6	18	41.52	32	38.4	17	15.58	64	7.8	11	5.72	69	16.6
Aug. 7.7	5.89	31	22.0	16	41.85	33	37.1	13	16.23	65	7.3	5	6.41	69	17.9
17.7	6.18	29	20.7	13	42.16	31	36.1	10	16.87	64	7.3	0	7.07	66	19.7
27.7	6.46	28	19.6	11	42.45	29	35.6	5	17.47	60	8.0	7	7.69	62	21.8
Sept. 6.6	6.71	25	18.8	8	42.72	27	35.6	0	18.02	55	9.2	12	8.28	59	24.2
16.6	6.94	23	18.3	5	42.96	24	36.0	4	18.51	49	11.0	18	8.81	53	26.8
26.6	7.13	19	18.1	2	43.16	20	36.8	8	18.91	40	13.3	23	9.27	46	29.7
Oct. 6.6	7.30	17	18.2	1	43.33	17	37.9	11	19.22	31	16.0	27	9.67	40	32.8
16.5	7.44	14	18.6	4	43.47	14	39.4	15	19.43	21	18.9	29	10.00	33	35.9
26.5	7.55	11	19.1	5	43.57	10	41.1	17	19.53	10	22.1	32	10.25	25	39.1
Nov. 5.5	7.62	7	19.9	8	43.64	7	43.0	19	19.52	1	25.3	32	10.42	17	42.3
15.4	7.67	5	20.8	9	43.67	3	45.0	20	19.40	12	28.5	32	10.50	8	45.3
25.4	7.69	2	21.7	9	43.67	0	47.0	20	19.18	22	31.4	29	10.50	0	48.1
Dec. 5.4	7.68	1	22.8	11	43.64	3	48.9	19	18.87	31	34.1	27	10.41	9	50.8
15.4	7.64	4	23.8	10	43.57	7	50.7	18	18.48	39	36.4	23	10.24	17	53.1
25.3	7.57	7	24.7	9	43.48	9	52.2	15	18.01	47	38.2	18	10.00	24	55.0
35.3	7.49	8	25.6	9	43.37	11	53.5	13	17.50	51	39.4	12	9.67	33	56.4
Sec δ, Tan δ	1.002		−0.059		1.096		−0.449		2.796		−2.611		2.562		+2.358
Mean Place	$3^{s}.092$		46″.70		$39^{s}.156$		68″.11		$13^{s}.900$		45″.34		$2^{s}.701$		15″.85
$D'_\psi a$ $D_\omega a$	0.00		0.00		−0.01		+0.02		−0.04		+0.14		+0.04		−0.13
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	ξ² Ceti. Mag. 4.3				σ Ceti. Mag. 4.8				36 H. Cassiopeiæ. Mag. 5.3				ν Ceti. Mag. 5.0			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 2 23		° ′ + 8 4		h m 2 28		° ′ −15 36		h m 2 29		° ′ +72 26		h m 2 31		° ′ + 5 13	
	s		″		s		″		s		″		s		″	
an. 0.3	39.39	9	55.2	6	4.72	10	60.1	10	57.31	48	74.9	14	25.87	9	30.4	7
10.3	39.30	11	54.6	6	4.62	13	61.1	8	56.83	55	76.3	8	25.78	10	29.7	6
20.3	39.19	13	54.0	5	4.49	14	61.9	5	56.28	59	77.1	3	25.68	13	29.1	5
30.2	39.06	13	53.5	5	4.35	15	62.4	3	55.69	61	77.4	3	25.55	13	28.6	5
eb. 9.2	38.93	13	53.0	5	4.20	14	62.7	1	55.08	60	77.1	9	25.42	14	28.1	4
19.2	38.80	13	52.5	4	4.06	14	62.6	3	54.48	56	76.2	14	25.28	13	27.7	3
lar. 1.2	38.67	11	52.1	3	3.92	13	62.3	7	53.92	49	74.8	19	25.15	11	27.4	2
11.1	38.56	8	51.8	1	3.79	10	61.6	9	53.43	40	72.9	22	25.04	9	27.2	0
21.1	38.48	6	51.7	0	3.69	7	60.7	12	53.03	29	70.7	25	24.95	6	27.2	1
31.1	38.42	2	51.7	1	3.62	4	59.5	15	52.74	16	68.2	26	24.89	3	27.3	3
pr. 10.1	38.40	3	51.8	4	3.58	1	58.0	17	52.58	2	65.6	27	24.86	2	27.6	6
20.0	38.43	7	52.2	6	3.59	5	56.3	19	52.56	12	62.9	27	24.88	6	28.2	7
30.0	38.50	12	52.8	8	3.64	10	54.4	22	52.68	25	60.2	26	24.94	11	28.9	10
lay 10.0	38.62	16	53.6	11	3.74	15	52.2	23	52.93	39	57.6	23	25.05	15	29.9	12
19.9	38.78	20	54.7	12	3.89	18	49.9	23	53.32	52	55.3	20	25.20	19	31.1	13
29.9	38.98	24	55.9	14	4.07	23	47.6	25	53.84	62	53.3	16	25.39	24	32.4	16
une 8.9	39.22	27	57.3	16	4.30	25	45.1	24	54.46	71	51.7	12	25.63	26	34.0	16
18.9	39.49	30	58.9	17	4.55	28	42.7	23	55.17	78	50.5	7	25.89	29	35.6	18
28.8	39.79	31	60.6	17	4.83	31	40.4	23	55.95	83	49.8	3	26.18	30	37.4	18
uly 8.8	40.10	32	62.3	18	5.14	31	38.1	20	56.78	86	49.5	2	26.48	31	39.2	17
18.8	40.42	32	64.1	17	5.45	32	36.1	18	57.64	87	49.7	7	26.79	32	40.9	17
28.8	40.74	31	65.8	17	5.77	31	34.3	14	58.51	87	50.4	12	27.11	31	42.6	17
ug. 7.7	41.05	30	67.5	15	6.08	30	32.9	12	59.38	84	51.6	16	27.42	31	44.3	15
17.7	41.35	29	69.0	13	6.38	29	31.7	8	60.22	81	53.2	19	27.73	28	45.8	12
27.7	41.64	26	70.3	12	6.67	26	30.9	3	61.03	75	55.1	24	28.01	27	47.0	11
ept. 6.6	41.90	24	71.5	10	6.93	24	30.6	0	61.78	69	57.5	26	28.28	24	48.1	8
16.6	42.14	21	72.5	7	7.17	21	30.6	4	62.47	61	60.1	29	28.52	21	48.9	6
26.6	42.35	18	73.2	5	7.38	18	31.0	7	63.08	53	63.0	31	28.73	19	49.5	4
Oct. 6.6	42.53	15	73.7	3	7.56	14	31.7	10	63.61	43	66.1	32	28.92	15	49.9	1
16.5	42.68	12	74.0	1	7.70	12	32.7	13	64.04	33	69.3	33	29.07	13	50.0	1
26.5	42.80	9	74.1	0	7.82	8	34.0	15	64.37	22	72.6	33	29.20	10	49.9	3
Nov. 5.5	42.89	6	74.1	3	7.90	5	35.5	16	64.59	12	75.9	33	29.30	7	49.6	4
15.5	42.95	4	73.8	3	7.95	2	37.1	16	64.71	0	79.2	31	29.37	4	49.2	5
25.4	42.99	0	73.5	4	7.97	2	38.7	16	64.71	12	82.3	28	29.41	0	48.7	6
Dec. 5.4	42.99	3	73.1	5	7.95	4	40.3	16	64.59	23	85.1	26	29.41	2	48.1	7
15.4	42.96	5	72.6	6	7.91	7	41.9	14	64.36	34	87.7	21	29.39	5	47.4	6
25.3	42.91	8	72.0	6	7.84	9	43.3	11	64.02	42	89.8	17	29.34	7	46.8	7
35.3	42.83		71.4		7.75		44.4		63.60		91.5		29.27		46.1	
ec δ, Tan δ	1.010		+0.142		1.038		−0.279		3.317		+3.162		1.004		+0.091	
ean Place	38ˢ.244		46″.74		3ˢ.433		61″.26		55ˢ.347		50″.86		24ˢ.676		22″.74	
$D'_\psi\alpha$, $D_\omega\alpha$	0.00		−0.01		0.00		+0.01		+0.05		−0.17		0.00		−0.01	
$D_\psi\delta$, $D_\omega\delta$	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	38 Cassiopeiæ. Mag. 6.0				η Piscium. Mag. 3.7				40 Cassiopeiæ. Mag. 5.5				υ Andromedæ. Mag. 4.2		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Decl tion
	h m 1 24		° ′ +69 49		h m 1 26		° ′ +14 54		h m 1 31		° ′ +72 36		h m 1 31		° +40
	s		″		s		″		s		″		s		″
Jan. 0.3	53.38	48	64.0	5	56.70	11	38.7	5	42.37	57	51.5	7	48.81	16	68.8
10.3	52.90	51	64.5	0	56.59	12	38.2	6	41.80	60	52.2	1	48.65	17	68.8
20.2	52.39	51	64.5	6	56.47	12	37.6	7	41.20	61	52.3	5	48.48	19	68.4
30.2	51.88	49	63.9	12	56.35	12	36.9	8	40.59	59	51.8	11	48.29	18	67.6
Feb. 9.2	51.39	45	62.7	17	56.23	11	36.1	8	40.00	54	50.7	16	48.11	16	66.5
19.1	50.94	39	61.0	21	56.12	10	35.3	7	39.46	47	49.1	20	47.95	15	65.1
Mar. 1.1	50.55	30	58.9	24	56.02	7	34.6	7	38.99	37	47.1	24	47.80	11	63.5
11.1	50.25	20	56.5	26	55.95	4	33.9	5	38.62	26	44.7	26	47.69	6	61.8
21.1	50.05	8	53.9	28	55.91	0	33.4	4	38.36	13	42.1	28	47.63	2	60.0
31.0	49.97	3	51.1	27	55.91	4	33.0	2	38.23	1	39.3	28	47.61	3	58.3
Apr. 10.0	50.00	16	48.4	26	55.95	9	32.8	1	38.24	15	36.5	28	47.64	10	56.7
20.0	50.16	28	45.8	25	56.04	13	32.9	3	38.39	29	33.7	25	47.74	15	55.2
30.0	50.44	39	43.3	21	56.17	17	33.2	6	38.68	42	31.2	23	47.89	21	54.0
May 9.9	50.83	49	41.2	18	56.34	22	33.8	9	39.10	54	28.9	19	48.10	26	53.1
19.9	51.32	58	39.4	13	56.56	25	34.7	11	39.64	64	27.0	14	48.36	31	52.6
29.9	51.90	66	38.1	8	56.81	29	35.8	13	40.28	73	25.6	10	48.67	34	52.4
June 8.8	52.56	70	37.3	3	57.10	31	37.1	16	41.01	79	24.6	5	49.01	37	52.6
18.8	53 26	74	37.0	2	57.41	32	38.7	17	41.80	83	24.1	0	49.38	39	53.2
28.8	54.00	76	37.2	6	57.73	33	40.4	18	42.63	86	24.1	5	49.77	40	54.1
July 8.8	54.76	75	37.8	12	58.06	33	42.2	19	43.49	86	24.6	11	50.17	40	55.4
18.7	55.51	74	39.0	17	58.39	32	44.1	20	44.35	84	25.7	15	50.57	39	57.0
28.7	56.25	70	40.7	21	58.71	31	46.1	19	45.19	80	27.2	19	50.96	37	58.9
Aug. 7.7	56.95	65	42.8	24	59.02	28	48.0	18	45.99	75	29.1	24	51.33	34	61.0
17.7	57.60	59	45.2	28	59.30	26	49.8	17	46.74	69	31.5	27	51.67	32	63.3
27.6	58.19	52	48.0	30	59.56	23	51.5	16	47.43	61	34.2	30	51.99	28	65.6
Sept. 6.6	58.71	45	51.0	33	59.79	19	53.1	15	48.04	53	37.2	32	52.27	25	68.1
16.6	59.16	36	54.3	34	59.98	16	54.6	12	48.57	43	40.4	34	52.52	20	70.6
26.5	59.52	27	57.7	35	60.14	14	55.8	10	49.00	33	43.8	35	52.72	17	73.1
Oct. 6.5	59.79	19	61.2	35	60.28	10	56.8	9	49.33	23	47.3	36	52.89	12	75.5
16.5	59.98	10	64.7	34	60.38	6	57.7	6	49.56	12	50.9	35	53.01	8	77.8
26.5	60.08	0	68.1	32	60.44	4	58.3	5	49.68	1	54.4	33	53.09	5	79.9
Nov. 5.4	60.08	9	71.3	31	60.48	1	58.8	2	49.69	9	57.7	32	53.14	0	81.9
15.4	59.99	18	74.4	27	60.49	2	59.0	1	49.60	20	60.9	29	53.14	3	83.6
25.4	59.81	27	77.1	24	60.47	5	59.1	0	49.40	30	63.8	25	53.11	6	85.1
Dec. 5.4	59.54	34	79.5	20	60.42	6	59.1	2	49.10	39	66.3	21	53.05	10	86.3
15.3	59.20	41	81.5	14	60.36	8	58.9	4	48.71	48	68.4	16	52.95	12	87.1
25.3	58.79	45	82.9	9	60.28	11	58.5	5	48.23	54	70.0	11	52.83	15	87.6
35.3	58.34		83.8		60.17		58.0		47.69		71.1		52.68		87.8
Sec δ, Tan δ	2.901		+2.723		1.035		+0.266		3.346		+3.194		1.325		+0.869
Mean Place	$52^{s}.980$		$39''.72$		$55^{s}.924$		$28''.83$		$41^{s}.838$		$26''.78$		$48^{s}.127$		$50''.71$
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.03		−0.18		0.00		−0.02		+0.03		−0.20		+0.01		−0.05
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**π Piscium.** Mag. 5.6				**υ Persei.** Mag. 3.8				**α Eridani.** (*Achernar.*) Mag. 0.6				**ω Cassiopeiæ.** Mag. 5.5			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 32		+11 42		1 32		+48 11		1 34		−57 39		1 35		+67 36	
	s		″		s		″		s		″		s		″	
an. 0.3	36.22	10	34.3	5	46.69	20	72.7	1	34.74	32	77.5	4	62.25	41	73.2	6
10.3	36.12	12	33.8	7	46.49	21	72.8	3	34.42	33	77.9	2	61.84	45	73.8	1
20.2	36.00	12	33.1	6	46.28	22	72.5	8	34.09	33	77.7	7	61.39	46	73.9	5
30.2	35.88	12	32.5	7	46.06	21	71.7	11	33.76	31	77.0	12	60.93	44	73.4	11
eb. 9.2	35.76	11	31.8	6	45.85	20	70.6	14	33.45	29	75.8	18	60.49	41	72.3	15
19.2	35.65	10	31.2	6	45.65	17	69.2	18	33.16	25	74.0	22	60.08	36	70.8	20
ar. 1.1	35.55	7	30.6	5	45.48	14	67.4	19	32.91	21	71.8	26	59.72	29	68.8	23
11.1	35.48	4	30.1	4	45.34	8	65.5	20	32.70	17	69.2	30	59.43	20	66.5	25
21.1	35.44	1	29.7	2	45.26	3	63.5	21	32.53	10	66.2	32	59.23	10	64.0	27
31.0	35.43	3	29.5	1	45.23	3	61.4	19	32.43	4	63.0	35	59.13	1	61.3	27
pr. 10.0	35.46	8	29.6	2	45.26	10	59.5	18	32.39	3	59.5	36	59.14	12	58.6	26
20.0	35.54	12	29.8	5	45.36	17	57.7	16	32.42	10	55.9	36	59.26	23	56.0	24
30.0	35.66	17	30.3	7	45.53	23	56.1	13	32.52	17	52.3	36	59.49	34	53.6	21
ay 9.9	35.83	21	31.0	10	45.76	28	54.8	9	32.69	24	48.7	35	59.83	44	51.5	17
19.9	36.04	24	32.0	13	46.04	34	53.9	5	32.93	30	45.2	34	60.27	52	49.8	14
29.9	36.28	28	33.3	14	46.38	38	53.4	1	33.23	36	41.8	31	60.79	58	48.4	8
une 8.9	36.56	30	34.7	16	46.76	41	53.3	3	33.59	40	38.7	27	61.37	64	47.6	4
18.8	36.86	32	36.3	18	47.17	43	53.6	8	33.99	44	36.0	24	62.01	68	47.2	1
28.8	37.18	32	38.1	19	47.60	44	54.4	11	34.43	47	33.6	19	62.69	70	47.3	6
uly 8.8	37.50	33	40.0	19	48.04	44	55.5	15	34.90	48	31.7	13	63.39	69	47.9	11
18.7	37.83	32	41.9	19	48.48	43	57.0	18	35.38	48	30.4	9	64.08	69	49.0	15
28.7	38.15	30	43.8	18	48.91	41	58.8	21	35.86	46	29.5	3	64.77	65	50.5	20
Aug. 7.7	38.45	29	45.6	18	49.32	38	60.9	23	36.32	43	29.2	3	65.42	62	52.5	23
17.7	38.74	26	47.4	16	49.70	35	63.2	25	36.75	40	29.5	9	66.04	56	54.8	26
27.6	39.00	23	49.0	14	50.05	31	65.7	27	37.15	35	30.4	14	66.60	51	57.4	30
Sept. 6.6	39.23	20	50.4	13	50.36	28	68.4	27	37.50	29	31.8	18	67.11	43	60.4	31
16.6	39.43	16	51.7	11	50.64	22	71.1	28	37.79	23	33.6	23	67.54	36	63.5	33
26.6	39.59	14	52.8	8	50.86	18	73.9	27	38.02	16	35.9	26	67.90	29	66.8	34
Oct. 6.5	39.73	10	53.6	6	51.04	14	76.6	26	38.18	9	38.5	28	68.19	21	70.2	33
16.5	39.83	7	54.2	5	51.18	9	79.2	26	38.27	2	41.3	29	68.40	12	73.5	34
26.5	39.90	4	54.7	2	51.27	4	81.8	23	38.29	5	44.2	29	68.52	4	76.9	32
Nov. 5.4	39.94	2	54.9	1	51.31	0	84.1	21	38.24	12	47.1	28	68.56	5	80.1	30
15.4	39.96	2	55.0	1	51.31	4	86.2	19	38.12	17	49.9	26	68.51	12	83.1	27
25.4	39.94	4	54.9	2	51.27	8	88.1	15	37.95	22	52.5	22	68.39	20	85.8	24
Dec. 5.4	39.90	6	54.7	3	51.19	12	89.6	12	37.73	26	54.7	18	68.19	28	88.2	19
15.3	39.84	8	54.4	5	51.07	15	90.8	8	37.47	29	56.5	13	67.91	34	90.1	15
25.3	39.76	10	53.9	5	50.92	18	91.6	3	37.18	32	57.8	8	67.57	40	91.6	10
35.3	39.66		53.4		50.74		91.9		36.86		58.6		67.17		92.6	
ec δ, Tan δ	1.021		+0.207		1.500		+1.119		1.869		−1.580		2.626		+2.428	
ean Place	$35^{s}.397$		$25''.42$		$46^{s}.020$		$52''.66$		$32^{s}.979$		$66''.31$		$61^{s}.604$		$49''.20$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		−0.01		+0.01		−0.07		−0.02		+0.10		+0.03		−0.15	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ν Piscium.** Mag. 4.7				**φ Persei.** Mag. 4.2				**τ Ceti.** Mag. 3.6				**o Piscium.** Mag. 4.5		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decl tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	1 37		+ 5 3		1 38		+50 15		1 40		−16 22		1 40		+ 8
	s		″		s		″		s		″		s		″
Jan. 0.3	1.27	11	35.1	6	20.19	20	60.3	2	8.17	12	65.3	8	55.08	11	57.1
10.3	1.16	11	34.5	6	19.99	22	60.5	3	8.05	13	66.1	5	54.97	11	56.5
20.2	1.05	12	33.9	6	19.77	24	60.2	6	7.92	13	66.6	2	54.86	12	55.9
30.2	0.93	12	33.3	5	19.53	23	59.6	11	7.79	14	66.8	0	54.74	12	55.3
Feb. 9.2	0.81	11	32.8	5	19.30	21	58.5	14	7.65	13	66.8	3	54.62	12	54.7
19.2	0.70	10	32.3	3	19.09	19	57.1	17	7.52	11	66.5	6	54.50	10	54.2
Mar. 1.1	0.60	7	32.0	2	18.90	15	55.4	20	7.41	9	65.9	9	54.40	8	53.7
11.1	0.53	5	31.8	0	18.75	10	53.4	21	7.32	6	65.0	12	54.32	5	53.4
21.1	0.48	1	31.8	2	18.65	4	51.3	21	7.26	3	63.8	14	54.27	1	53.2
31.0	0.47	3	32.0	4	18.61	3	49.2	20	7.23	1	62.4	17	54.26	2	53.2
Apr. 10.0	0.50	7	32.4	7	18.64	9	47.2	19	7.24	6	60.7	19	54.28	7	53.4
20.0	0.57	11	33.1	8	18.73	16	45.3	17	7.30	10	58.8	21	54.35	12	53.8
30.0	0.68	16	33.9	12	18.89	23	43.6	14	7.40	14	56.7	23	54.47	15	54.4
May 9.9	0.84	20	35.1	13	19.12	29	42.2	10	7.54	18	54.4	23	54.62	20	55.3
19.9	1.04	24	36.4	15	19.41	34	41.2	7	7.72	23	52.1	25	54.82	24	56.4
29.9	1.28	27	37.9	17	19.75	39	40.5	2	7.95	26	49.6	25	55.06	27	57.8
June 8.9	1.55	29	39.6	18	20.14	42	40.3	2	8.21	28	47.1	24	55.33	29	59.3
18.8	1.84	31	41.4	19	20.56	44	40.5	6	8.49	30	44.7	23	55.62	31	61.0
28.8	2.15	32	43.3	20	21.00	46	41.1	10	8.79	32	42.4	22	55.93	33	62.8
July 8.8	2.47	32	45.3	19	21.46	45	42.1	14	9.11	32	40.2	19	56.26	32	64.7
18.7	2.79	31	47.2	18	21.91	45	43.5	17	9.43	32	38.3	17	56.58	32	66.6
28.7	3.10	30	49.0	18	22.36	43	45.2	21	9.75	30	36.6	14	56.90	30	68.5
Aug. 7.7	3.40	28	50.8	16	22.79	40	47.3	23	10.05	28	35.2	10	57.20	29	70.2
17.7	3.68	26	52.4	14	23.19	37	49.6	25	10.33	26	34.2	6	57.49	26	71.9
27.6	3.94	23	53.8	11	23.56	33	52.1	26	10.59	24	33.6	3	57.75	24	73.4
Sept. 6.6	4.17	20	54.9	9	23.89	29	54.7	28	10.83	20	33.3	1	57.99	20	74.7
16.6	4.37	17	55.8	7	24.18	24	57.5	28	11.03	16	33.4	5	58.19	17	75.8
26.6	4.54	14	56.5	5	24.42	19	60.3	27	11.19	13	33.9	8	58.36	15	76.7
Oct. 6.5	4.68	10	57.0	2	24.61	15	63.0	28	11.32	10	34.7	10	58.51	11	77.4
16.5	4.78	7	57.2	0	24.76	10	65.8	26	11.42	6	35.7	12	58.62	7	77.8
26.5	4.85	4	57.2	2	24.86	5	68.4	24	11.48	3	36.9	14	58.69	5	78.0
Nov. 5.4	4.89	2	57.0	3	24.91	1	70.8	23	11.51	0	38.3	14	58.74	2	78.1
15.4	4.91	1	56.7	4	24.92	3	73.1	19	11.51	3	39.7	15	58.76	1	78.0
25.4	4.90	4	56.3	5	24.89	9	75.0	17	11.48	6	41.2	14	58.75	3	77.7
Dec. 5.4	4.86	6	55.8	6	24.80	12	76.7	13	11.42	7	42.6	13	58.72	5	77.4
15.3	4.80	8	55.2	6	24.68	16	78.0	9	11.35	10	43.9	11	58.67	8	76.9
25.3	4.72	9	54.6	7	24.52	19	78.9	5	11.25	12	45.0	9	58.59	9	76.4
35.3	4.63		53.9		24.33		79.4		11.13		45.9		58.50		75.8
Sec δ, Tan δ	1.004		+0.089		1.564		+1.203		1.042		−0.294		1.012		+0.154
Mean Place	0s.378		28″.40		19s.473		39″.68		7s.122		64″.87		54s.186		49″.10
D′ψ a, Dω a	0.00		−0.01		+0.01		−0.07		0.00		+0.02		0.00		−0.01
Dψ δ, Dω δ	+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4		+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	**ε Sculptoris.** Mag. 5.4 Right Ascension.		**ε Sculptoris.** Declination S.		**ζ Ceti.** Mag. 3.9 Right Ascension.		**ζ Ceti.** Declination S.		**α Trianguli.** Mag. 3.6 Right Ascension.		**α Trianguli.** Declination N.		**ε Cassiopeiæ.** Mag. 3.4 Right Ascension.		**ε Cassiopeiæ.** Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 41		−25 28		1 47		−10 44		1 48		+29 9		1 48		+63 15	
	s		″		s		″		s		″		s		″	
n. 0.3	40.83		40.2		16.91		74.6		14.78		69.7		16.77		30.8	
10.3	40.70	13	41.0	8	16.80	11	75.4	8	14.66	12	69.5	2	16.45	32	31.5	7
20.2	40.55	15	41.4	4	16.68	12	75.9	5	14.52	14	69.1	4	16.09	36	31.6	1
30.2	40.40	15	41.5	1	16.55	13	76.3	4	14.37	15	68.4	7	15.72	37	31.2	4
eb. 9.2	40.25	15	41.2	3	16 42	13	76.5	2	14.22	15	67.5	9	15.35	37	30.3	9
19.2	40.11	14	40.7	5	16.30	12	76.4	1	14.08	14	66.5	10	15.00	35	28.9	14
ar. 1.1	39.99	12	39.7	10	16.19	11	76.1	3	13.95	13	65.3	12	14.69	31	27.1	18
11.1	39.89	10	38.4	13	16.10	9	75.5	6	13.85	10	64.1	12	14.44	25	24.9	22
21.1	39.82	7	36.8	16	16.04	6	74.7	8	13.79	6	62.9	12	14.26	18	22.6	23
31.1	39.78	4	34.9	19	16.01	3	73.6	11	13.76	3	61.8	11	14.16	10	20.1	25
pr. 10.0	39.79	1	32.8	21	16.03	2	72.3	13	13.78	2	60.8	10	14.16	0	17.5	26
20.0	39.84	5	30.5	23	16.08	5	70.8	15	13.85	7	59.9	9	14.24	8	15.1	24
30.0	39.94	10	27.9	26	16.18	10	69.0	18	13.97	12	59.3	6	14.43	19	12.8	23
ay 9.9	40.08	14	25.3	26	16.32	14	67.0	20	14.14	17	59.0	3	14.71	28	10.8	20
19.9	40.27	19	22.6	27	16.50	18	64.9	21	14.36	22	59.0	0	15.07	36	9.1	17
29.9	40.50	23	19.8	28	16.72	22	62.7	22	14.62	26	59.3	3	15.50	43	7.8	13
ne 8.9	40.76	26	17.1	27	16.98	26	60.5	22	14.92	30	59.9	6	16.00	50	6.9	9
18.8	41.06	30	14.5	26	17.26	28	58.2	23	15.24	32	60.8	9	16.55	55	6.5	4
28.8	41.37	31	12.1	24	17.56	30	56.0	22	15.58	34	62.0	12	17.13	58	6.6	1
ly 8.8	41.70	33	9.9	22	17.88	32	53.9	21	15.94	36	63.4	14	17.74	61	7.2	6
18.8	42.04	34	8.0	19	18.20	32	51.9	20	16.30	36	65.1	17	18.35	61	8.2	10
28.7	42.37	33	6.5	15	18.51	31	50.2	17	16.65	35	66.9	18	18.95	60	9.7	15
ug. 7.7	42.68	31	5.4	11	18.81	30	48.7	15	16.99	34	68.8	19	19.53	58	11.5	18
17.7	42.98	30	4.7	7	19.10	29	47.6	11	17.31	32	70.8	20	20.08	55	13.7	22
27.6	43.26	28	4.4	3	19.37	27	46.7	9	17.61	30	72.8	20	20.58	50	16.2	25
ept. 6.6	43.50	24	4.6	2	19.60	23	46.3	4	17.87	26	74.8	20	21.04	46	18.9	27
16.6	43.71	21	5.1	5	19.81	21	46.1	2	18.11	24	76.8	20	21.45	41	21.9	30
26.6	43.89	18	6.0	9	19.98	17	46.3	2	18.31	20	78.6	18	21.79	34	25.0	31
ct. 6.5	44.02	13	7.3	13	20.12	14	46.7	4	18.48	17	80.4	18	22.07	28	28.2	32
16.5	44.12	10	8.8	15	20.23	11	47.5	8	18.61	13	82.0	16	22.28	21	31.4	32
26.5	44.19	7	10.6	18	20.31	8	48.4	9	18.70	9	83.5	15	22.42	14	34.5	31
ov. 5.5	44.21	2	12.4	18	20.35	4	49.5	11	18.77	7	84.8	13	22.50	8	37.6	31
15.4	44.20	1	14.3	19	20.36	1	50.7	12	18.80	3	85.8	10	22.50	0	40.4	28
25.4	44.17	3	16.2	19	20.35	1	52.0	13	18.80	0	86.7	9	22.43	7	43.0	26
Dec. 5.4	44.10	7	17.9	17	20.31	4	53.2	12	18.77	3	87.4	7	22.30	13	45.3	23
15.3	44.01	9	19.4	15	20.25	6	54.4	12	18.71	6	87.8	4	22.10	20	47.2	19
25.3	43.90	11	20.7	13	20.17	8	55.5	11	18.62	9	88.0	2	21.85	25	48.7	15
35.3	43.77	13	21.7	10	20.06	11	56.4	9	18.51	11	87.9	1	21.54	31	49.6	9
ec δ, Tan δ	1.108		−0.476		1.018		−0.190		1.145		+0.558		2.222		+1.985	
ean Place	$39^s.682$		36″.93		$15^s.863$		76″.15		$13^s.918$		54″.88		$15^s.916$		7″.54	
$_{\psi}\alpha$, $D_{\omega}\alpha$	−0.01		+0.03		0.00		+0.01		+0.01		−0.03		+0.02		−0.12	
$_{\psi}\delta$, $D_{\omega}\delta$	+0.4		+0.4		+0.4		+0.5		+0.4		+0.5		+0.4		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ξ Piscium. Mag. 4.8				β Arietis. Mag. 2.7				ψ Phœnicis. Mag. 4.4				υ Ceti. Mag. 4.2		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decli tion
	h m		° ′		h m		° ′		h m		° ′		h m		
	1 49		+ 2 46		1 49		+20 23		1 50		−46 42		1 55		−21
	s		″		s		″		s		″		s		″
Jan. 0.3	10.19	10	12.2	6	57.34	11	46.8	4	15.73	22	76.6	8	61.15	12	82.
10.3	10.09	12	11.6	6	57.23	12	46.4	5	15.51	24	77.4	2	61.03	14	83.
20.2	9.97	12	11.0	6	57.11	13	45.9	7	15.27	24	77.6	3	60.89	15	84.
30.2	9.85	12	10.4	4	56.98	14	45.2	7	15.03	23	77.3	7	60.74	14	84.
Feb. 9.2	9.73	12	10.0	4	56.84	13	44.5	9	14.80	22	76.6	13	60.60	14	84.
19.2	9.61	11	9.6	2	56.71	11	43.6	8	14.58	20	75.3	17	60.46	13	84.
Mar. 1.1	9.50	8	9.4	1	56.60	9	42.8	9	14.38	17	73.6	21	60.33	11	83.
11.1	9.42	6	9.3	1	56.51	6	41.9	8	14.21	13	71.5	24	60.22	8	82.
21.1	9.36	2	9.4	3	56.45	3	41.1	7	14.08	9	69.1	28	60.14	4	80.
31.1	9.34	1	9.7	5	56.42	2	40.4	5	13.99	4	66.3	31	60.10	1	79.
Apr. 10.0	9.35	6	10.2	8	56.44	6	39.9	3	13.95	2	63.2	32	60.09	4	77.
20.0	9.41	10	11.0	10	56.50	11	39.6	1	13.97	8	60.0	33	60.13	8	75.
30.0	9.51	15	12.0	12	56.61	16	39.5	2	14.05	13	56.7	34	60.21	13	73.
May 9.9	9.66	19	13.2	14	56.77	21	39.7	5	14.18	19	53.3	34	60.34	17	70.5
19.9	9.85	22	14.6	16	56.98	24	40.2	7	14.37	24	49.9	33	60.51	22	67.
29.9	10.07	26	16.2	18	57.22	28	40.9	10	14.61	29	46.6	31	60.73	25	65.
June 8.9	10.33	29	18.0	19	57.50	31	41.9	12	14.90	33	43.5	29	60.98	28	62.7
18.8	10.62	30	19.9	19	57.81	32	43.1	15	15.23	37	40.6	25	61.26	30	60.1
28.8	10.92	32	21.8	20	58.13	34	44.6	16	15.60	38	38.1	22	61.56	32	57.7
July 8.8	11.24	32	23.8	19	58.47	34	46.2	18	15.98	39	35.9	17	61.88	33	55.5
18.8	11.56	31	25.7	18	58.81	33	48.0	18	16.37	40	34.2	12	62.21	32	53.6
28.7	11.87	31	27.5	17	59.14	32	49.8	18	16.77	38	33.0	8	62.53	32	51.9
Aug. 7.7	12.18	28	29.2	15	59.46	30	51.6	19	17.15	37	32.2	1	62.85	30	50.6
17.7	12.46	27	30.7	13	59.76	28	53.5	18	17.52	34	32.1	4	63.15	27	49.7
27.6	12.73	23	32.0	10	60.04	26	55.3	17	17.86	31	32.5	9	63.42	25	49.3
Sept. 6.6	12.96	21	33.0	8	60.30	22	57.0	16	18.17	26	33.4	14	63.67	22	49.2
16.6	13.17	18	33.8	6	60.52	19	58.6	14	18.43	21	34.8	18	63.89	19	49.5
26.6	13.35	15	34.4	2	60.71	16	60.0	13	18.64	16	36.6	22	64.08	15	50.2
Oct. 6.5	13.50	11	34.6	1	60.87	13	61.3	12	18.80	11	38.8	25	64.23	11	51.3
16.5	13.61	8	34.7	2	61.00	9	62.5	9	18.91	5	41.3	27	64.34	8	52.6
26.5	13.69	6	34.5	3	61.09	6	63.4	7	18.96	1	44.0	27	64.42	5	54.2
Nov. 5.5	13.75	2	34.2	4	61.15	4	64.1	6	18.97	4	46.7	26	64.47	1	55.9
15.4	13.77	0	33.8	6	61.19	0	64.7	4	18.93	9	49.3	25	64.48	2	57.6
25.4	13.77	3	33.2	7	61.19	3	65.1	2	18.84	13	51.8	23	64.46	4	59.4
Dec. 5.4	13.74	5	32.5	7	61.16	5	65.3	1	18.71	17	54.1	20	64.42	8	61.1
15.3	13.69	7	31.8	7	61.11	7	65.4	2	18.54	19	56.1	15	64.34	10	62.6
25.3	13.62	9	31.1	6	61.04	10	65.2	3	18.35	21	57.6	11	64.24	11	63.9
35.3	13.53		30.5		60.94		64.9		18.14		58.7		64.13		65.0
Sec δ, Tan δ	1.001		+0.048		1.067		+0.372		1.458		−1.062		1.075		−0.39
Mean Place	9s.215		6″.08		56s.440		34″.70		14s.194		68″.20		59s.966		81″.17
$D'_\psi a$, $D_\omega a$	0.00		0.00		0.00		−0.02		−0.01		+0.06		−0.01		+0.02
′, $D_\omega \delta$	+0.4		+0.5		+0.4		+0.5		+0.4		+0.5		+0.3		+0.5

n Solar ate.	***α* Hydri.** Mag. 3.0				**50 Cassiopeiæ.** Mag. 4.1				***γ* Andromedæ *pr*.** Mag. 2.3				***α* Arietis.** Mag. 2.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	1 56		−61 58		1 56		+72 0		1 58		+41 55		2 2		+23 3	
	s		″		s		″		s		″		s		″	
l. 0.3	7.22		70.4		10.03		62.9		41.45		39.2		23.65		52.8	
10.3	6.84	38	71.0	6	9.51	52	63.9	10	41.30	15	39.4	2	23.54	11	52.5	3
20.3	6.44	40	71.0	0	8.94	57	64.4	5	41.12	18	39.2	2	23.42	12	52.1	4
30.2	6.03	41	70.5	5	8.35	59	64.2	2	40.93	19	38.7	5	23.29	13	51.5	6
b. 9.2	5.64	39	69.4	11	7.77	58	63.4	8	40.74	19	37.8	9	23.14	15	50.8	7
19.2	5.27	37	67.7	17	7.22	55	62.1	13	40.56	18	36.7	11	23.00	14	49.9	9
ır. 1.1	4.93	34	65.6	21	6.73	49	60.4	17	40.39	17	35.3	14	22.88	12	49.0	9
11.1	4.64	29	63.1	25	6.31	42	58.2	22	40.25	14	33.7	16	22.78	10	48.1	9
21.1	4.40	24	60.2	29	6.00	31	55.7	25	40.16	9	32.0	17	22.70	8	47.2	9
31.1	4.23	17	57.0	32	5.81	19	53.0	27	40.11	5	30.3	17	22.66	4	46.4	8
r. 10.0	4.12	11	53.5	35	5.75	6	50.3	27	40.11	0	28.7	16	22.67	1	45.7	7
20.0	4.10	2	49.9	36	5.83	8	47.5	28	40.17	6	27.1	16	22.72	5	45.3	4
30.0	4.15	5	46.2	37	6.04	21	44.9	26	40.29	12	25.8	13	22.82	10	45.0	3
ay 10.0	4.28	13	42.5	37	6.39	35	42.6	23	40.47	18	24.8	10	22.98	16	45.0	0
19.9	4.49	21	38.9	36	6.85	46	40.5	21	40.71	24	24.0	8	23.17	19	45.2	2
29.9	4.78	29	35.4	35	7.43	58	38.8	17	41.00	29	23.6	4	23.41	24	45.8	6
ne 8.9	5.13	35	32.2	32	8.10	67	37.5	13	41.33	33	23.5	1	23.69	28	46.6	8
18.8	5.54	41	29.3	29	8.84	74	36.8	7	41.69	36	23.9	4	23.99	30	47.6	10
28.8	6.00	46	26.7	26	9.64	80	36.5	3	42.08	39	24.6	7	24.31	32	48.9	13
ly 8.8	6.50	50	24.7	20	10.47	83	36.7	2	42.48	40	25.6	10	24.65	34	50.4	15
18.8	7.02	52	23.1	16	11.31	84	37.4	7	42.88	40	26.9	13	25.00	35	52.0	16
28.7	7.54	52	22.1	10	12.15	84	38.6	12	43.28	40	28.5	16	25.34	34	53.7	17
ug. 7.7	8.06	52	21.7	4	12.97	82	40.2	16	43.67	39	30.3	18	25.67	33	55.5	18
17.7	8.56	50	21.9	2	13.74	77	42.3	21	44.04	37	32.3	20	25.99	32	57.4	19
27.7	9.02	46	22.6	7	14.46	72	44.7	24	44.39	35	34.5	22	26.28	29	59.2	18
ept. 6.6	9.43	41	24.0	14	15.12	66	47.4	27	44.70	31	36.8	23	26.54	26	60.9	17
16.6	9.79	36	25.8	18	15.70	58	50.4	30	44.98	28	39.2	24	26.78	24	62.6	17
26.6	10.07	28	28.1	23	16.20	50	53.6	32	45.22	24	41.6	24	26.99	21	64.1	15
ct. 6.5	10.28	21	30.7	26	16.61	41	57.0	34	45.43	21	43.9	23	27.16	17	65.5	14
16.5	10.42	14	33.6	29	16.92	31	60.4	34	45.59	16	46.1	22	27.30	14	66.7	12
26.5	10.47	5	36.7	31	17.13	21	63.8	34	45.71	12	48.3	22	27.41	11	67.8	11
ov. 5.5	10.44	3	39.7	30	17.23	10	67.2	34	45.80	9	50.3	20	27.49	8	68.7	9
15.4	10.33	11	42.7	30	17.22	1	70.4	32	45.84	4	52.1	18	27.54	5	69.4	7
25.4	10.16	17	45.5	28	17.11	11	73.4	30	45.84	0	53.7	16	27.55	1	69.9	5
Dec. 5.4	9.92	24	47.9	24	16.89	22	76.0	26	45.81	3	55.1	14	27.54	1	70.3	4
15.4	9.62	30	50.0	21	16.58	31	78.3	23	45.74	7	56.1	10	27.49	5	70.5	2
25.3	9.28	34	51.5	15	16.18	40	80.2	19	45.63	11	56.8	7	27.42	7	70.5	0
35.3	8.91	37	52.5	10	15.69	49	81.5	13	45.49	14	57.2	4	27.33	9	70.3	2
ec δ, Tan δ	2.129		−1.879		3.239		+3.081		1.344		+0.898		1.087		+0.426	
lean Place	5^{s}.081		59″.49		8^{s}.901		38″.42		40^{s}.520		20″.73		22^{s}.676		39″.78	
$Y_{\phi}\alpha$, $D_{m}\alpha$	−0.02		+0.11		+0.04		−0.18		+0.01		−0.05		+0.01		−0.02	
$Y_{\phi}\delta$, $D_{m}\delta$	+0.3		+0.5		+0.3		+0.5		+0.3		+0.5		+0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Trianguli. Mag. 3.1				55 Cassiopeiæ. Mag. 6.2				6 Persei. Mag. 5.4				ξ¹ Ceti. Mag. 4.5		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination
	h m		° ′		h m		° ′		h m		° ′		h m		°
	2 4		+34 35		2 7		+66 7		2 7		+50 40		2 8		+ 8
	s		″		s		″		s		″		s		″
Jan. 0.3	29.82		25.3		48.84		59.8		57.66		38.2		30.61		62.6
10.3	29.69	13	25.3	0	48.48	36	60.8	10	57.47	19	38.7	5	30.51	10	62.0
20.3	29.55	14	25.0	3	48.08	40	61.2	4	57.25	22	38.8	1	30.40	11	61.4
30.2	29.39	16	24.5	5	47.66	42	61.1	1	57.02	23	38.4	4	30.28	12	60.8
Feb. 9.2	29.22	17	23.7	8	47.24	42	60.4	7	56.77	25	37.7	7	30.15	13	60.3
19.2	29.05	17	22.7	10	46.83	41	59.2	12	56.54	23	36.5	12	30.02	13	59.8
Mar. 1.1	28.91	14	21.5	12	46.45	38	57.6	16	56.33	21	35.0	15	29.90	12	59.4
11.1	28.78	13	20.2	13	46.13	32	55.6	20	56.15	18	33.3	17	29.80	10	59.1
21.1	28.69	9	18.8	14	45.89	24	53.3	23	56.01	14	31.4	19	29.73	7	58.9
31.1	28.65	4	17.4	14	45.73	16	50.8	25	55.93	8	29.3	21	29.69	4	58.9
Apr. 10.0	28.65	0	16.1	13	45.67	6	48.2	26	55.91	2	27.3	20	29.69	0	59.1
20.0	28.70	5	15.0	11	45.72	5	45.7	25	55.97	6	25.4	19	29.73	4	59.4
30.0	28.81	11	14.1	9	45.87	15	43.3	24	56.09	12	23.6	18	29.82	9	60.0
May 10.0	28.97	16	13.4	7	46.13	26	41.0	23	56.28	19	22.0	16	29.95	13	60.8
19.9	29.18	21	13.0	4	46.49	36	39.1	19	56.54	26	20.8	12	30.12	17	61.9
29.9	29.44	26	12.9	1	46.93	44	37.5	16	56.85	31	19.9	9	30.34	22	63.2
June 8.9	29.74	30	13.2	3	47.45	52	36.4	11	57.21	36	19.3	6	30.59	25	64.6
18.8	30.07	33	13.7	5	48.03	58	35.7	7	57.62	41	19.2	1	30.87	28	66.3
28.8	30.43	36	14.6	9	48.66	63	35.4	3	58.06	44	19.5	3	31.17	30	68.0
July 8.8	30.80	37	15.8	12	49.31	65	35.6	2	58.51	45	20.1	6	31.48	31	69.8
18.8	31.17	37	17.2	14	49.98	67	36.3	7	58.97	46	21.1	10	31.81	33	71.6
28.7	31.54	37	18.8	16	50.65	67	37.4	11	59.43	46	22.5	14	32.13	32	73.3
Aug. 7.7	31.91	37	20.6	18	51.30	65	39.0	16	59.88	45	24.2	17	32.44	31	75.0
17.7	32.25	34	22.6	20	51.93	63	40.9	19	60.31	43	26.2	20	32.73	29	76.6
27.7	32.58	33	24.6	20	52.51	58	43.2	23	60.71	40	28.4	22	33.01	28	78.0
Sept. 6.6	32.87	29	26.6	20	53.05	54	45.7	25	61.08	37	30.8	24	33.26	25	79.3
16.6	33.13	26	28.7	21	53.54	49	48.5	28	61.41	33	33.3	25	33.49	23	80.3
26.6	33.36	23	30.7	20	53.96	42	51.5	30	61.70	29	35.9	26	33.69	20	81.1
Oct. 6.5	33.56	20	32.7	20	54.31	35	54.7	32	61.95	25	38.5	26	33.86	17	81.7
16.5	33.72	16	34.6	19	54.59	28	57.9	32	62.15	20	41.1	26	33.99	13	82.0
26.5	33.84	12	36.3	17	54.80	21	61.1	32	62.30	15	43.7	26	34.10	11	82.2
Nov. 5.5	33.93	9	37.9	16	54.92	12	64.2	31	62.41	11	46.1	24	34.18	8	82.2
15.4	33.98	5	39.3	14	54.97	5	67.2	30	62.46	5	48.4	23	34.22	4	82.0
25.4	33.99	1	40.5	12	54.93	4	70.0	28	62.47	1	50.5	21	34.24	2	81.7
Dec. 5.4	33.97	2	41.5	10	54.82	11	72.5	25	62.43	4	52.3	18	34.23	1	81.3
15.4	33.92	5	42.2	7	54.63	19	74.7	22	62.34	9	53.8	15	34.19	4	80.8
25.3	33.84	8	42.7	5	54.37	26	76.4	17	62.21	13	55.0	12	34.13	6	80.3
35.3	33.73	11	42.9	2	54.04	33	77.7	13	62.04	17	55.7	7	34.05	8	79.7
Sec δ, Tan δ	1.215		+0.690		2.471		+2.260		1.578		+1.221		1.011		+0.14
Mean Place	28ˢ.842		8″.76		47ˢ.612		36″.26		56ˢ.608		17″.60		29ˢ.556		54″.1
D′ψ α, Dω α	+0.01		−0.04		+0.03		−0.13		+0.02		−0.07		0.00		−0.01
Dψ δ, Dω δ	+0.3		+0.5		+0.3		+0.5		+0.3		+0.5		+0.3		+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	μ Fornacis. Mag. 5.2				γ Trianguli. Mag. 4.1				67 Ceti. Mag. 5.7				φ Eridani. Mag. 3.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	2 9		−31 6		2 12		+33 27		2 12		− 6 48		2 13		−51 53	
	s		″		s		″		s		″		s		″	
an. 0.3	10.99	15	84.8	10	16.41	12	32.9	0	45.71	10	44.9	8	30.10	26	87.7	10
10.3	10.84	16	85.8	6	16.29	14	32.9	2	45.61	12	45.7	7	29.84	28	88.7	5
20.3	10.68	17	86.4	2	16.15	16	32.7	5	45.49	13	46.4	5	29.56	29	89.2	1
30.2	10.51	18	86.6	2	15.99	17	32.2	7	45.36	13	46.9	3	29.27	28	89.1	7
eb. 9.2	10.33	17	86.4	6	15.82	16	31.5	10	45.23	13	47.2	2	28.99	28	88.4	11
19.2	10.16	15	85.8	10	15.66	15	30.5	11	45.10	13	47.4	1	28.71	26	87.3	16
lar. 1.2	10.01	14	84.8	14	15.51	13	29.4	12	44.97	10	47.3	4	28.45	23	85.7	21
11.1	9.87	11	83.4	17	15.38	9	28.2	13	44.87	8	46.9	5	28.22	19	83.6	25
21.1	9.76	7	81.7	20	15.29	6	26.9	13	44.79	5	46.4	8	28.03	14	81.1	28
31.1	9.69	3	79.7	23	15.23	0	25.6	12	44.74	2	45.6	11	27.89	9	78.3	31
.pr. 10.0	9.66	1	77.4	26	15.23	4	24.4	11	44.72	3	44.5	13	27.80	3	75.2	33
20.0	9.67	6	74.8	27	15.27	10	23.3	9	44.75	8	43.2	15	27.77	3	71.9	35
30.0	9.73	11	72.1	29	15.37	15	22.4	6	44.83	12	41.7	16	27.80	10	68.4	35
lay 10.0	9.84	16	69.2	29	15.52	20	21.8	4	44.95	16	40.1	19	27.90	16	64.9	35
19.9	10.00	20	66.3	30	15.72	25	21.4	1	45.11	20	38.2	20	28.06	22	61.4	35
29.9	10.20	25	63.3	29	15.97	29	21.3	3	45.31	24	36.2	21	28.28	28	57.9	33
me 8.9	10.45	28	60.4	28	16.26	33	21.6	6	45.55	27	34.1	22	28.56	33	54.6	30
18.9	10.73	31	57.6	26	16.59	35	22.2	8	45.82	29	31.9	21	28.89	36	51.6	27
28.8	11.04	32	55.0	23	16.94	36	23.0	11	46.11	30	29.8	21	29.25	40	48.9	23
ıly 8.8	11.36	34	52.7	20	17.30	37	24.1	14	46.41	32	27.7	19	29.65	42	46.6	19
18.8	11.70	34	50.7	16	17.67	37	25.5	16	46.73	31	25.8	18	30.07	42	44.7	14
28.7	12.04	33	49.1	12	18.04	36	27.1	17	47.04	31	24.0	15	30.49	42	43.3	8
ug. 7.7	12.37	32	47.9	7	18.40	34	28.8	19	47.35	29	22.5	13	30.91	40	42.5	2
17.7	12.69	30	47.2	2	18.74	33	30.7	19	47.64	28	21.2	10	31.31	39	42.3	3
27.7	12.99	27	47.0	2	19.07	30	32.6	20	47.92	25	20.2	7	31.70	34	42.6	9
ept. 6.6	13.26	24	47.2	7	19.37	26	34.6	19	48.17	22	19.5	3	32.04	31	43.5	14
16.6	13.50	21	47.9	12	19.63	24	36.5	20	48.39	20	19.2	0	32.35	26	44.9	19
26.6	13.71	17	49.1	15	19.87	20	38.5	19	48.59	17	19.2	2	32.61	20	46.8	23
ct. 6.6	13.88	13	50.6	18	20.07	17	40.4	18	48.76	13	19.4	6	32.81	15	49.1	26
16.5	14.01	8	52.4	20	20.24	13	42.2	16	48.89	10	20.0	8	32.96	8	51.7	28
26.5	14.09	5	54.4	22	20.37	9	43.8	15	48.99	8	20.8	9	33.04	3	54.5	30
iov. 5.5	14.14	2	56.6	23	20.46	6	45.3	13	49.07	4	21.7	11	33.07	3	57.5	29
15.4	14.16	3	58.9	22	20.52	3	46.6	12	49.11	1	22.8	11	33.04	8	60.4	28
25.4	14.13	6	61.1	20	20.55	1	47.8	9	49.12	1	23.9	12	32.96	13	63.2	25
ec. 5.4	14.07	8	63.1	19	20.54	4	48.7	7	49.11	5	25.1	11	32.83	18	65.7	22
15.4	13.99	11	65.0	16	20.50	8	49.4	5	49.06	6	26.2	10	32.65	21	67.9	18
25.3	13.88	14	66.6	13	20.42	11	49.9	2	49.00	9	27.2	10	32.44	25	69.7	14
35.3	13.74		67.9		20.31		50.1		48.91		28.2		32.19		71.1	
c δ, Tan δ	1.168		−0.604		1.199		+0.661		1.007		−0.119		1.621		−1.275	
an Place	9s.631		80″.88		15s.373		16″.74		44s.552		48″.36		28s.273		79″.30	
ψε, Dω α	−0.01		+0.03		+0.01		−0.04		0.00		+0.01		−0.02		+0.07	
ψε, Dω δ	+0.3		+0.5		+0.3		+0.5		+0.3		+0.5		+0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*o* **Ceti.** (*Mira.*) Var. 1.7–9.6				**κ Fornacis.** Mag. 5.4				**δ Hydri.** Mag. 4.3				**ι Cassiopeiæ.** Mag. 4.6		
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.
	h m 2 15		° ′ − 3 21		h m 2 18		° ′ −24 11		h m 2 20		° ′ −69 2		h m 2 22		° +67
	s		″		s		″		s		″		s		″
Jan. 0.3	4.24	10	42.1	8	40.48	13	69.8	10	16.82	54	55.8	8	4.22	36	39.3
10.3	4.14	11	42.9	6	40.35	14	70.8	7	16.28	57	56.6	3	3.86	41	40.5
20.3	4.03	13	43.5	6	40.21	15	71.5	4	15.71	58	56.9	3	3.45	44	41.1
30.2	3.90	13	44.1	4	40.06	16	71.9	0	15.13	57	56.6	9	3.01	44	41.1
Feb. 9.2	3.77	13	44.5	2	39.90	16	71.9	3	14.56	56	55.7	15	2.57	44	40.7
19.2	3.64	12	44.7	0	39.74	15	71.6	7	14.00	52	54.2	20	2.13	41	39.7
Mar. 1.2	3.52	11	44.7	2	39.59	13	70.9	10	13.48	46	52.2	25	1.72	35	38.2
11.1	3.41	8	44.5	4	39.46	10	69.9	14	13.02	40	49.7	28	1.37	29	36.3
21.1	3.33	5	44.1	6	39.36	8	68.5	17	12.62	33	46.9	32	1.08	19	34.1
31.1	3.28	1	43.5	8	39.28	3	66.8	19	12.29	23	43.7	34	0.89	9	31.7
Apr. 10.0	3.27	3	42.7	11	39.25	1	64.9	22	12.06	13	40.3	37	0.80	1	29.1
20.0	3.30	7	41.6	13	39.26	6	62.7	24	11.93	4	36.6	37	0.81	13	26.6
30.0	3.37	12	40.3	15	39.32	10	60.3	25	11.89	7	32.9	38	0.94	23	24.1
May 10.0	3.49	16	38.8	16	39.42	15	57.8	27	11.96	17	29.1	37	1.17	34	21.7
19.9	3.65	20	37.2	19	39.57	20	55.1	27	12.13	27	25.4	35	1.51	43	19.7
29.9	3.85	24	35.3	19	39.77	23	52.4	28	12.40	37	21.9	34	1.94	51	18.0
June 8.9	4.09	26	33.4	20	40.00	27	49.6	26	12.77	45	18.5	30	2.45	59	16.6
18.9	4.35	29	31.4	21	40.27	29	47.0	25	13.22	52	15.5	27	3.04	63	15.7
28.8	4.64	31	29.3	20	40.56	31	44.5	23	13.74	58	12.8	22	3.67	67	15.2
July 8.8	4.95	31	27.3	19	40.87	33	42.2	21	14.32	62	10.6	17	4.34	69	15.2
18.8	5.26	32	25.4	18	41.20	32	40.1	17	14.94	64	8.9	11	5.03	69	15.7
28.7	5.58	31	23.6	16	41.52	33	38.4	13	15.58	65	7.8	5	5.72	69	16.6
Aug. 7.7	5.89	29	22.0	13	41.85	31	37.1	10	16.23	64	7.3	0	6.41	66	17.9
17.7	6.18	28	20.7	11	42.16	29	36.1	5	16.87	60	7.3	7	7.07	62	19.7
27.7	6.46	25	19.6	8	42.45	27	35.6	0	17.47	55	8.0	12	7.69	59	21.8
Sept. 6.6	6.71	23	18.8	5	42.72	24	35.6	4	18.02	49	9.2	18	8.28	53	24.2
16.6	6.94	19	18.3	2	42.96	20	36.0	8	18.51	40	11.0	23	8.81	46	26.8
26.6	7.13	17	18.1	1	43.16	17	36.8	11	18.91	31	13.3	27	9.27	40	29.7
Oct. 6.6	7.30	14	18.2	4	43.33	14	37.9	15	19.22	21	16.0	29	9.67	33	32.8
16.5	7.44	11	18.6	5	43.47	10	39.4	17	19.43	10	18.9	32	10.00	25	35.9
26.5	7.55	7	19.1	8	43.57	7	41.1	19	19.53	1	22.1	32	10.25	17	39.1
Nov. 5.5	7.62	5	19.9	9	43.64	3	43.0	20	19.52	12	25.3	32	10.42	8	42.3
15.4	7.67	2	20.8	9	43.67	0	45.0	20	19.40	22	28.5	29	10.50	0	45.3
25.4	7.69	1	21.7	11	43.67	3	47.0	19	19.18	31	31.4	27	10.50	9	48.1
Dec. 5.4	7.68	4	22.8	10	43.64	7	48.9	18	18.87	39	34.1	23	10.41	17	50.8
15.4	7.64	7	23.8	9	43.57	9	50.7	15	18.48	47	36.4	18	10.24	24	53.1
25.3	7.57	8	24.7	9	43.48	11	52.2	13	18.01	51	38.2	12	10.00	33	55.0
35.3	7.49		25.6		43.37		53.5		17.50		39.4		9.67		56.4
Sec δ, Tan δ	1.002		−0.059		1.096		−0.449		2.796		−2.611		2.562		+2.358
Mean Place	3$^{\mathrm{s}}$.092		46″.70		39$^{\mathrm{s}}$.156		68″.11		13$^{\mathrm{s}}$.900		45″.34		2$^{\mathrm{s}}$.701		15″.85
$D'_\psi a$ $D_\omega a$	0.00		0.00		−0.01		+0.02		−0.04		+0.14		+0.04		−0.13
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	ξ^2 Ceti. Mag. 4.3				σ Ceti. Mag. 4.8				36 H. Cassiopeiæ. Mag. 5.3				ν Ceti. Mag. 5.0			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 2 23		° ′ + 8 4		h m 2 28		° ′ −15 36		h m 2 29		° ′ +72 26		h m 2 31		° ′ + 5 13	
	s		″		s		″		s		″		s		″	
n. 0.3	39.39		55.2		4.72		60.1		57.31		74.9		25.87		30.4	
10.3	39.30	9	54.6	6	4.62	10	61.1	10	56.83	48	76.3	14	25.78	9	29.7	7
20.3	39.19	11	54.0	6	4.49	13	61.9	8	56.28	55	77.1	8	25.68	10	29.1	6
30.2	39.06	13	53.5	5	4.35	14	62.4	5	55.69	59	77.4	3	25.55	13	28.6	5
eb. 9.2	38.93	13	53.0	5	4.20	15	62.7	3	55.08	61	77.1	3	25.42	13	28.1	5
19.2	38.80	13	52.5	5	4.06	14	62.6	1	54.48	60	76.2	9	25.28	14	27.7	4
ar. 1.2	38.67	13	52.1	4	3.92	14	62.3	3	53.92	56	74.8	14	25.15	13	27.4	3
11.1	38.56	11	51.8	3	3.79	13	61.6	7	53.43	49	72.9	19	25.04	11	27.2	2
21.1	38.48	8	51.7	1	3.69	10	60.7	9	53.03	40	70.7	22	24.95	9	27.2	0
31.1	38.42	6	51.7	0	3.62	7	59.5	12	52.74	29	68.2	25	24.89	6	27.3	1
pr. 10.1	38.40	2	51.8	1	3.58	4	58.0	15	52.58	16	65.6	26	24.86	3	27.6	3
20.0	38.43	3	52.2	4	3.59	1	56.3	17	52.56	2	62.9	27	24.88	2	28.2	6
30.0	38.50	7	52.8	6	3.64	5	54.4	19	52.68	12	60.2	27	24.94	6	28.9	7
ay 10.0	38.62	12	53.6	8	3.74	10	52.2	22	52.93	25	57.6	26	25.05	11	29.9	10
19.9	38.78	16	54.7	11	3.89	15	49.9	23	53.32	39	55.3	23	25.20	15	31.1	12
29.9	38.98	20	55.9	12	4.07	18	47.6	23	53.84	52	53.3	20	25.39	19	32.4	13
ne 8.9	39.22	24	57.3	14	4.30	23	45.1	25	54.46	62	51.7	16	25.63	24	34.0	16
18.9	39.49	27	58.9	16	4.55	25	42.7	24	55.17	71	50.5	12	25.89	26	35.6	16
28.8	39.79	30	60.6	17	4.83	28	40.4	23	55.95	78	49.8	7	26.18	29	37.4	18
ly 8.8	40.10	31	62.3	17	5.14	31	38.1	23	56.78	83	49.5	3	26.48	30	39.2	18
18.8	40.42	32	64.1	18	5.45	31	36.1	20	57.64	86	49.7	2	26.79	31	40.9	17
28.8	40.74	32	65.8	17	5.77	32	34.3	18	58.51	87	50.4	7	27.11	32	42.6	17
g. 7.7	41.05	31	67.5	17	6.08	31	32.9	14	59.38	87	51.6	12	27.42	31	44.3	17
17.7	41.35	30	69.0	15	6.38	30	31.7	12	60.22	84	53.2	16	27.73	31	45.8	15
27.7	41.64	29	70.3	13	6.67	29	30.9	8	61.03	81	55.1	19	28.01	28	47.0	12
ept. 6.6	41.90	26	71.5	12	6.93	26	30.6	3	61.78	75	57.5	24	28.28	27	48.1	11
16.6	42.14	24	72.5	10	7.17	24	30.6	0	62.47	69	60.1	26	28.52	24	48.9	8
26.6	42.35	21	73.2	7	7.38	21	31.0	4	63.08	61	63.0	29	28.73	21	49.5	6
ct. 6.6	42.53	18	73.7	5	7.56	18	31.7	7	63.61	53	66.1	31	28.92	19	49.9	4
16.5	42.68	15	74.0	3	7.70	14	32.7	10	64.04	43	69.3	32	29.07	15	50.0	1
26.5	42.80	12	74.1	1	7.82	12	34.0	13	64.37	33	72.6	33	29.20	13	49.9	1
ov. 5.5	42.89	9	74.1	0	7.90	8	35.5	15	64.59	22	75.9	33	29.30	10	49.6	3
15.5	42.95	6	73.8	3	7.95	5	37.1	16	64.71	12	79.2	33	29.37	7	49.2	4
25.4	42.99	4	73.5	3	7.97	2	38.7	16	64.71	0	82.3	31	29.41	4	48.7	5
Dec. 5.4	42.99	0	73.1	4	7.95	2	40.3	16	64.59	12	85.1	28	29.41	0	48.1	6
15.4	42.96	3	72.6	5	7.91	4	41.9	16	64.36	23	87.7	26	29.39	2	47.4	7
25.3	42.91	5	72.0	6	7.84	7	43.3	14	64.02	34	89.8	21	29.34	5	46.8	6
35.3	42.83	8	71.4	6	7.75	9	44.4	11	63.60	42	91.5	17	29.27	7	46.1	7
c δ, Tan δ	1.010		+0.142		1.038		−0.279		3.317		+3.162		1.004		+0.091	
an Place	38ˢ.244		46″.74		3ˢ.433		61″.26		55ˢ.347		50″.86		24ˢ.676		22″.74	
$V_{\psi}\alpha$, $D_{\psi}\alpha$	0.00		−0.01		0.00		+0.01		+0.05		−0.17		0.00		−0.01	
$_{\psi}\delta$, $D_{\psi}\delta$	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	μ Hydri. Mag. 5.3				ν Arietis. Mag. 5.4				δ Ceti. Mag. 4.0				ε Hydri. Mag. 4.3		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decli- tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	2 33		−79 28		2 33		+21 35		2 35		− 0 1		2 38		−68
	s		″		s		″		s		″		s		″
Jan. 0.3	31.91		59.8		60.39		52.6		8.69		69.0		19.67		61.1
10.3	30.75	116	60.7	9	60.30	9	52.4	2	8.61	8	69.7	7	19.15	52	62.2
20.3	29.52	123	61.0	3	60.18	12	52.1	3	8.50	11	70.4	7	18.60	55	62.7
30.2	28.26	126	60.6	4	60.05	13	51.6	5	8.37	13	71.0	6	18.02	58	62.7
Feb. 9.2	27.02	124	59.7	9	59.90	15	51.1	5	8.24	13	71.5	5	17.44	58	62.0
19.2	25.81	121	58.2	15	59.75	15	50.4	7	8.10	14	71.8	3	16.87	57	60.8
Mar. 1.2	24.67	114	56.2	20	59.61	14	49.7	7	7.97	13	71.9	1	16.34	53	59.1
11.1	23.64	103	53.8	24	59.49	12	48.9	8	7.85	12	71.9	0	15.85	49	56.9
21.1	22.73	91	50.9	29	59.39	10	48.2	7	7.75	10	71.7	2	15.41	44	54.2
31.1	21.97	76	47.7	32	59.32	7	47.5	7	7.69	6	71.3	4	15.05	36	51.2
Apr. 10.1	21.37	60	44.3	34	59.30	2	46.9	6	7.66	3	70.7	6	14.78	27	47.9
20.0	20.94	43	40.7	36	59.32	2	46.5	4	7.67	1	69.8	9	14.59	19	44.4
30.0	20.71	23	37.0	37	59.38	6	46.3	2	7.73	6	68.8	10	14.51	8	40.7
May 10.0	20.68	3	33.2	38	59.50	12	46.3	0	7.83	10	67.5	13	14.53	2	37.0
19.9	20.84	16	29.5	37	59.67	17	46.5	2	7.97	14	66.0	15	14.65	12	33.3
29.9	21.19	35	26.0	35	59.88	21	46.9	4	8.16	19	64.4	16	14.87	22	29.7
June 8.9	21.73	54	22.7	33	60.13	25	47.6	7	8.39	23	62.6	18	15.19	32	26.2
18.9	22.43	70	19.7	30	60.41	28	48.6	10	8.64	25	60.8	18	15.59	40	23.1
28.8	23.29	86	17.1	26	60.72	31	49.7	11	8.92	28	58.9	19	16.07	48	20.3
July 8.8	24.27	98	14.9	22	61.04	32	51.0	13	9.22	30	57.0	19	16.62	55	17.9
18.8	25.35	108	13.2	17	61.38	34	52.5	15	9.53	31	55.1	19	17.21	59	16.0
28.8	26.49	114	12.1	11	61.72	34	54.0	15	9.85	32	53.3	18	17.83	62	14.6
Aug. 7.7	27.66	117	11.6	5	62.05	33	55.6	16	10.16	31	51.7	16	18.47	64	13.8
17.7	28.83	117	11.7	1	62.37	32	57.2	16	10.46	30	50.3	14	19.10	63	13.6
27.7	29.95	112	12.4	7	62.68	31	58.8	16	10.74	28	49.2	11	19.71	61	14.1
Sept. 6.6	30.99	104	13.7	13	62.96	28	60.4	16	11.00	26	48.3	9	20.28	57	15.2
16.6	31.92	93	15.5	18	63.22	26	61.8	14	11.24	24	47.7	6	20.78	50	16.8
26.6	32.70	78	17.8	23	63.46	24	63.1	13	11.46	22	47.3	4	21.21	43	18.9
Oct. 6.6	33.30	60	20.5	27	63.66	20	64.3	12	11.65	19	47.3	0	21.56	35	21.5
16.5	33.69	39	23.6	31	63.84	18	65.3	10	11.81	16	47.5	2	21.81	25	24.4
26.5	33.88	19	26.8	32	63.98	14	66.2	9	11.93	12	47.8	3	21.96	15	27.5
Nov. 5.5	33.84	4	30.0	32	64.09	11	67.0	8	12.03	10	48.4	6	22.00	4	30.8
15.5	33.57	27	33.3	33	64.17	8	67.6	6	12.10	7	49.2	8	21.93	7	34.0
25.4	33.10	47	36.3	30	64.22	5	68.0	4	12.14	4	50.0	8	21.76	17	37.1
Dec. 5.4	32.42	68	39.0	27	64.24	2	68.3	3	12.15	1	50.9	9	21.49	27	40.0
15.4	31.57	85	41.3	23	64.22	2	68.5	2	12.13	2	51.8	9	21.14	35	42.5
25.3	30.57	100	43.1	18	64.17	5	68.5	0	12.08	5	52.7	9	20.71	43	44.5
35.3	29.46	111	44.4	13	64.10	7	68.4	1	12.00	8	53.5	8	20.22	49	46.0
Sec δ, Tan δ	5.475		−5.383		1.076		+0.396		1.000		−0.001		2.744		−2.55
Mean Place	26ˢ.416		49″.47		59ˢ.203		39″.96		7ˢ.461		75″.01		16ˢ.634		51″.66
D′ψ α, Dω α	−0.09		+0.28		+0.01		−0.02		0.00		0.00		−0.04		+0.13
Dψ δ, Dω δ	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**θ Persei.** Mag. 4.2				**γ Ceti** *seq.* Mag. 3.7				**π Ceti.** Mag. 4.4				**μ Ceti.** Mag. 4.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 2 38		° ′ +48 52		h m 2 38		° ′ + 2 52		h m 2 40		° ′ −14 12		h m 2 40		° ′ + 9 45	
	s		″		s		″		s		″		s		″	
Jan. 0.3	24.55		30.8		54.91		48.4		5.90		63.3		21.91		30.6	
10.3	24.39	16	31.5	7	54.82	9	47.7	7	5.80	10	64.4	11	21.82	9	30.0	6
20.3	24.20	19	31.9	4	54.71	11	47.1	6	5.68	12	65.2	8	21.72	10	29.5	5
30.3	23.98	22	31.8	1	54.59	12	46.5	6	5.54	14	65.8	6	21.60	12	29.0	5
Feb. 9.2	23.75	23	31.3	5	54.45	14	46.0	5	5.39	15	66.1	3	21.46	14	28.5	5
19.2	23.51	24	30.5	8	54.31	14	45.6	4	5.24	15	66.1	0	21.32	14	28.0	5
Mar. 1.2	23.29	22	29.3	12	54.18	13	45.4	2	5.09	15	65.9	2	21.19	13	27.6	4
11.1	23.09	20	27.9	14	54.06	12	45.3	1	4.96	13	65.4	5	21.07	12	27.2	4
21.1	22.93	16	26.2	17	53.96	10	45.4	1	4.85	11	64.5	9	20.97	10	27.0	2
31.1	22.82	11	24.4	18	53.89	7	45.6	2	4.77	8	63.4	11	20.90	7	26.9	1
Apr. 10.1	22.77	5	22.5	19	53.86	3	46.1	5	4.73	4	62.1	13	20.87	3	27.0	1
20.0	22.78	1	20.7	18	53.87	1	46.7	6	4.73	0	60.4	17	20.88	1	27.2	2
30.0	22.86	8	18.9	18	53.93	6	47.6	9	4.77	4	58.6	18	20.94	6	27.7	5
May 10.0	23.00	14	17.3	16	54.03	10	48.7	11	4.86	9	56.6	20	21.04	10	28.4	7
20.0	23.21	21	16.0	13	54.17	14	50.0	13	4.99	13	54.4	22	21.19	15	29.3	9
29.9	23.48	27	15.0	10	54.36	19	51.4	14	5.16	17	52.1	23	21.38	19	30.4	11
June 8.9	23.81	33	14.3	7	54.58	22	53.1	17	5.38	22	49.7	24	21.61	23	31.7	13
18.9	24.18	37	13.9	4	54.83	25	54.8	17	5.63	25	47.3	24	21.87	26	33.1	14
28.8	24.58	40	14.0	1	55.11	28	56.6	18	5.90	27	45.0	23	22.16	29	34.6	15
July 8.8	25.01	43	14.3	3	55.41	30	58.4	18	6.20	30	42.8	22	22.46	30	36.3	17
18.8	25.45	44	15.0	7	55.72	31	60.2	18	6.51	31	40.7	21	22.78	32	38.0	17
28.8	25.90	45	16.1	11	56.04	32	61.9	17	6.82	31	38.9	18	23.10	32	39.6	16
Aug. 7.7	26.35	45	17.4	13	56.35	31	63.5	16	7.13	31	37.4	15	23.42	32	41.2	16
17.7	26.79	44	19.0	16	56.65	30	64.9	14	7.44	31	36.2	12	23.73	31	42.7	15
27.7	27.20	41	20.9	19	56.94	29	66.1	12	7.73	29	35.4	8	24.02	29	44.0	13
Sept. 6.7	27.59	39	22.9	20	57.21	27	67.1	10	7.99	26	34.9	5	24.29	27	45.2	12
16.6	27.95	36	25.1	22	57.45	24	67.8	7	8.24	25	34.8	1	24.54	25	46.2	10
26.6	28.27	32	27.4	23	57.67	22	68.3	5	8.46	22	35.1	3	24.77	23	47.0	8
Oct. 6.6	28.55	28	29.8	24	57.86	19	68.5	2	8.65	19	35.8	7	24.97	20	47.5	5
16.5	28.79	24	32.2	24	58.02	16	68.5	0	8.80	15	36.8	10	25.14	17	47.9	4
26.5	28.99	20	34.5	23	58.16	14	68.2	3	8.93	13	38.0	12	25.28	14	48.0	1
Nov. 5.5	29.14	15	36.8	23	58.26	10	67.8	4	9.02	9	39.4	14	25.39	11	48.0	0
15.5	29.25	11	39.0	22	58.34	8	67.2	6	9.09	7	41.0	16	25.47	8	47.9	1
25.4	29.30	5	41.0	20	58.38	4	66.6	6	9.12	3	42.6	16	25.52	5	47.6	3
Dec. 5.4	29.31	1	42.8	18	58.39	1	65.8	8	9.12	0	44.2	16	25.54	2	47.2	4
15.4	29.27	4	44.4	16	58.37	2	65.0	8	9.09	3	45.7	15	25.53	1	46.8	4
25.4	29.18	9	45.7	13	58.33	4	64.2	8	9.03	6	47.1	14	25.49	4	46.3	5
35.3	29.05	13	46.6	9	58.26	7	63.5	7	8.94	9	48.3	12	25.42	7	45.7	6
Sec δ, Tan δ	1.520		+1.145		1.001		+0.050		1.032		−0.253		1.015		+0.172	
Mean Place	23^{s}.193		11″.05		53^{s}.664		41″.43		4^{s}.561		65″.18		20^{s}.674		21″.47	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.02		−0.06		0.00		0.00		0.00		+0.01		0.00		−0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Persei. Mag. 3.9				41 Arietis. Mag. 3.7				β Fornacis. Mag. 4.5				σ Arietis. Mag. 5.5		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decl tion
	h m 2 44		° ′ +55 32		h m 2 44		° ′ +26 54		h m 2 45		° ′ −32 45		h m 2 46		+1
	s		″		s		″		s		″		s		
Jan. 0.3	30.76		57.9		59.85		53.4		33.55		47.9		49.08		67.
10.3	30.57	19	58.9	10	59.76	9	53.4	0	33.41	14	49.2	13	49.00	8	66.
20.3	30.33	24	59.5	6	59.64	12	53.2	2	33.25	16	50.1	9	48.89	11	66.
30.3	30.07	26	59.6	1	59.50	14	52.8	4	33.07	18	50.7	6	48.76	13	65.
Feb. 9.2	29.78	29	59.3	3	59.34	16	52.3	5	32.87	20	50.8	1	48.62	14	65.
19.2	29.49	29	58.5	8	59.18	16	51.7	6	32.68	19	50.4	4	48.48	14	64.
Mar. 1.2	29.22	27	57.3	12	59.03	15	50.9	8	32.49	19	49.7	7	48.34	14	64.
11.1	28.97	25	55.8	15	58.89	14	50.0	9	32.32	17	48.5	12	48.21	13	63.
21.1	28.77	20	54.0	18	58.78	11	49.1	9	32.17	15	46.9	16	48.10	11	63.
31.1	28.62	15	52.0	20	58.70	8	48.2	9	32.06	11	45.0	19	48.03	7	62.
Apr. 10.1	28.54	8	49.9	21	58.66	4	47.3	9	31.98	8	42.8	22	48.00	3	62.
20.0	28.53	1	47.8	21	58.67	1	46.6	7	31.95	3	40.3	25	48.00	0	62.
30.0	28.60	7	45.7	21	58.73	6	46.0	6	31.96	1	37.6	27	48.05	5	62.
May 10.0	28.75	15	43.8	19	58.84	11	45.7	3	32.03	7	34.7	29	48.15	10	63.
20.0	28.98	23	42.2	16	59.00	16	45.5	2	32.15	12	31.7	30	48.30	15	63.
29.9	29.27	29	40.8	14	59.21	21	45.6	1	32.32	17	28.7	30	48.49	19	64.
June 8.9	29.63	36	39.7	11	59.46	25	46.0	4	32.53	21	25.7	30	48.72	23	65.
18.9	30.04	41	39.0	7	59.75	29	46.6	6	32.78	25	22.8	29	48.98	26	66.
28.8	30.49	45	38.7	3	60.06	31	47.5	9	33.06	28	20.0	28	49.27	29	68.
July 8.8	30.97	48	38.8	1	60.39	33	48.6	11	33.37	31	17.5	25	49.58	31	69.
18.8	31.47	50	39.2	4	60.74	35	49.8	12	33.70	33	15.3	22	49.90	32	71.
28.8	31.98	51	40.1	9	61.09	35	51.2	14	34.03	33	13.5	18	50.23	33	72.
Aug. 7.7	32.49	51	41.3	12	61.44	35	52.7	15	34.37	34	12.1	14	50.55	32	74
17.7	32.98	49	42.8	15	61.78	34	54.2	15	34.70	33	11.2	9	50.87	32	75
27.7	33.46	48	44.6	18	62.10	32	55.8	16	35.02	32	10.8	4	51.17	30	77.
Sept. 6.7	33.90	44	46.6	20	62.40	30	57.4	16	35.32	30	10.9	1	51.45	28	7
16.6	34.32	42	48.9	23	62.68	28	58.9	15	35.59	27	11.5	6	51.71	26	7
26.6	34.69	37	51.3	24	62.93	25	60.4	15	35.83	24	12.5	10	51.94	23	8
Oct. 6.6	35.02	33	53.8	25	63.15	22	61.8	14	36.03	20	14.0	15	52.15	21	8
16.5	35.30	28	56.4	26	63.35	20	63.1	13	36.20	17	15.8	18	52.33	18	8
26.5	35.53	23	59.1	27	63.51	16	64.3	12	36.33	13	18.0	22	52.48	15	8
Nov. 5.5	35.71	18	61.7	26	63.64	13	65.3	10	36.42	9	20.3	23	52.60	12	8
15.5	35.84	13	64.2	25	63.74	10	66.2	9	36.47	5	22.7	24	52.69	9	8
25.4	35.90	6	66.5	23	63.80	6	66.9	7	36.48	1	25.2	25	52.75	6	8
Dec. 5.4	35.91	1	68.7	22	63.82	2	67.5	6	36.45	3	27.5	23	52.78	3	8
15.4	35.85	6	70.6	19	63.82	0	68.0	5	36.39	6	29.7	22	52.77	1	8
25.4	35.74	11	72.2	16	63.78	4	68.3	3	36.30	9	31.6	19	52.73	4	8
35.3	35.58	16	73.5	13	63.70	8	68.4	1	36.17	13	33.2	16	52.67	6	81
Sec δ, Tan δ	1.768		+1.458		1.121		+0.508		1.189		−0.643		1.034		+0
Mean Place	29ˢ.228		36″.93		58ˢ.582		39″.24		31ˢ.992		44″.94		47ˢ.812		56″
D′ψ α, Dω α	+0.03		−0.07		+0.01		−0.03		−0.01		+0.03		0.00		−0
Dψ δ, Dω δ	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0

[Eph 15]

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**τ² Eridani.** Mag. 4.8				**τ Persei.** Mag. 4.1				**η Eridani.** Mag. 4.0				**ε Arietis** (*mean*). Mag. 4.6			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 2 47		° ′ −21 20		h m 2 48		° ′ +52 24		h m 2 52		° ′ − 9 13		h m 2 54		° ′ +21 0	
	s		″		s		″		s		″		s		″	
an. 0.3	12.32		73.4		14.85		76.0		17.83		65.4		22.20		16.1	
10.3	12.21	11	74.6	12	14.68	17	76.9	9	17.74	9	66.4	10	22.12	8	15.9	2
20.3	12.08	13	75.5	9	14.47	21	77.4	5	17.63	11	67.3	9	22.01	11	15.7	2
30.3	11.93	15	76.1	6	14.23	24	77.5	1	17.50	13	67.9	6	21.88	13	15.3	4
eb. 9.2	11.77	16	76.4	3	13.97	26	77.2	3	17.36	14	68.3	4	21.73	15	14.8	5
19.2	11.60	17	76.3	1	13.71	26	76.4	8	17.21	15	68.5	2	21.58	15	14.2	6
ar. 1.2	11.44	16	75.9	4	13.46	25	75.3	11	17.06	15	68.4	1	21.43	15	13.5	7
11.2	11.30	14	75.1	8	13.23	23	73.9	14	16.93	13	68.1	3	21.29	14	12.9	6
21.1	11.17	13	74.0	11	13.04	19	72.2	17	16.82	11	67.6	5	21.18	11	12.2	7
31.1	11.08	9	72.6	14	12.91	13	70.3	19	16.73	9	66.7	9	21.10	8	11.6	6
pr. 10.1	11.02	6	71.0	16	12.83	8	68.4	19	16.68	5	65.7	10	21.05	5	11.1	5
20.0	11.00	2	69.0	20	12.82	1	66.4	20	16.67	1	64.4	13	21.05	0	10.7	4
30.0	11.03	3	66.8	22	12.88	6	64.5	19	16.70	3	62.8	16	21.10	5	10.5	2
ay 10.0	11.10	7	64.4	24	13.02	14	62.7	18	16.78	8	61.1	17	21.20	10	10.5	0
20.0	11.22	12	61.9	25	13.23	21	61.2	15	16.90	12	59.2	19	21.34	14	10.7	2
29.9	11.39	17	59.3	26	13.50	27	59.9	13	17.07	17	57.1	21	21.53	19	11.1	4
une 8.9	11.60	21	56.7	26	13.83	33	58.9	10	17.28	21	55.0	21	21.76	23	11.7	6
18.9	11.84	24	54.0	27	14.22	39	58.3	6	17.52	24	52.8	22	22.03	27	12.5	8
28.9	12.11	27	51.5	25	14.64	42	58.1	2	17.78	26	50.6	22	22.33	30	13.6	11
uly 8.8	12.41	30	49.2	23	15.09	45	58.3	2	18.07	29	48.5	21	22.64	31	14.8	12
18.8	12.72	31	47.1	21	15.56	47	58.8	5	18.38	31	46.5	20	22.97	33	16.1	13
28.8	13.04	32	45.2	19	16.04	48	59.6	8	18.69	31	44.7	18	23.31	34	17.5	14
Aug. 7.7	13.35	31	43.7	15	16.52	48	60.8	12	19.00	31	43.2	15	23.64	33	19.0	15
17.7	13.66	31	42.6	11	16.98	46	62.3	15	19.30	30	41.9	13	23.97	33	20.5	15
27.7	13.96	30	41.9	7	17.43	45	64.0	17	19.59	29	40.9	10	24.28	31	21.9	14
Sept. 6.7	14.24	28	41.7	2	17.85	42	66.0	20	19.86	27	40.3	6	24.58	30	23.3	14
16.6	14.49	25	41.9	2	18.24	39	68.2	22	20.12	26	40.1	2	24.85	27	24.6	13
26.6	14.72	23	42.5	6	18.60	36	70.5	23	20.34	22	40.2	1	25.10	25	25.8	12
Oct. 6.6	14.92	20	43.5	10	18.91	31	72.9	24	20.54	20	40.6	4	25.32	22	26.9	11
16.5	15.08	16	44.8	13	19.18	27	75.3	24	20.71	17	41.3	7	25.52	20	27.8	9
26.5	15.21	13	46.4	16	19.41	23	77.8	25	20.85	14	42.3	10	25.68	16	28.6	8
Nov. 5.5	15.31	10	48.2	18	19.58	17	80.2	24	20.96	11	43.5	12	25.82	14	29.2	6
15.5	15.38	7	50.1	19	19.71	13	82.6	24	21.04	8	44.8	13	25.92	10	29.7	5
25.4	15.41	3	52.1	20	19.78	7	84.8	22	21.09	5	46.2	14	25.99	7	30.1	4
Dec. 5.4	15.40	1	54.1	20	19.80	2	86.8	20	21.10	1	47.6	14	26.02	3	30.4	3
15.4	15.36	4	55.9	18	19.76	4	88.6	18	21.09	1	49.0	14	26.03	1	30.5	1
25.4	15.30	6	57.6	17	19.67	9	90.1	15	21.04	5	50.3	13	26.00	3	30.5	0
35.3	15.20	10	59.0	14	19.53	14	91.2	11	20.97	7	51.4	11	25.93	7	30.5	0
Sec δ, Tan δ	1.074		−0.391		1.640		+1.299		1.013		−0.163		1.071		+0.384	
ean Place	10ˢ.893		73″.46		13ˢ.337		55″.69		16ˢ.469		68″.95		20ˢ.884		3″.66	
$D'_\psi \alpha$, $D_\omega \alpha$	−0.01		+0.02		+0.02		−0.06		0.00		+0.01		+0.01		−0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**47 H. Cephei.** Mag. 5.7				**θ Eridani.** Mag. 3.4				**α Ceti.** Mag. 2.8				**γ Persei.** Mag. 3.1		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		D ti
	h m		° ′		h m		° ′		h m		° ′		h m		
	2 54		+79 5		2 55		−40 38		2 57		+ 3 45		2 58		+
	s		″		s		″		s		″		s		
Jan. 0.3	47.60	75	27.4	18	4.15	17	45.6	15	51.39	8	32.3	7	39.53	17	48
10.3	46.85	88	29.2	14	3.98	20	47.1	10	51.31	10	31.6	7	39.36	21	49
20.3	45.97	97	30.6	7	3.78	21	48.1	6	51.21	12	30.9	5	39.15	24	50
30.3	45.00	102	31.3	1	3.57	23	48.7	1	51.09	14	30.4	5	38.91	26	50
Feb. 9.2	43.98	102	31.4	5	3.34	23	48.8	4	50.95	14	29.9	4	38.65	27	50
19.2	42.96	97	30.9	10	3.11	23	48.4	9	50.81	14	29.5	3	38.38	27	49
Mar. 1.2	41.99	89	29.9	16	2.88	21	47.5	14	50.67	13	29.2	1	38.11	24	48
11.2	41.10	75	28.3	20	2.67	18	46.1	17	50.54	11	29.1	0	37.87	20	47
21.1	40.35	60	26.3	24	2.49	15	44.4	21	50.43	8	29.1	2	37.67	15	45
31.1	39.75	40	23.9	27	2.34	11	42.3	25	50.35	5	29.3	4	37.52	10	43
Apr. 10.1	39.35	19	21.2	28	2.23	6	39.8	27	50.30	1	29.7	6	37.42	2	41
20.0	39.16	3	18.4	29	2.17	0	37.1	30	50.29	4	30.3	8	37.40	5	39
30.0	39.19	24	15.5	28	2.17	4	34.1	32	50.33	8	31.1	9	37.45	12	37
May 10.0	39.43	46	12.7	27	2.21	10	30.9	32	50.41	13	32.0	12	37.57	19	35
20.0	39.89	66	10.0	24	2.31	16	27.7	33	50.54	17	33.2	14	37.76	26	34
29.9	40.55	84	7.6	20	2.47	20	24.4	32	50.71	21	34.6	15	38.02	33	32
June 8.9	41.39	100	5.6	17	2.67	25	21.2	31	50.92	24	36.1	16	38.35	38	31
18.9	42.39	112	3.9	13	2.92	29	18.1	29	51.16	27	37.7	17	38.73	42	31
28.9	43.51	123	2.6	8	3.21	32	15.2	26	51.43	29	39.4	18	39.15	45	30
July 8.8	44.74	130	1.8	3	3.53	34	12.6	22	51.72	31	41.2	18	39.60	47	30
18.8	46.04	133	1.5	2	3.87	36	10.4	19	52.03	31	43.0	16	40.07	49	31
28.8	47.37	135	1.7	6	4.23	36	8.5	13	52.34	31	44.6	16	40.56	49	31.
Aug. 7.7	48.72	134	2.3	12	4.59	35	7.2	9	52.65	31	46.2	14	41.05	47	32.
17.7	50.06	130	3.5	15	4.94	35	6.3	3	52.96	29	47.6	11	41.52	46	34.
27.7	51.36	124	5.0	20	5.29	32	6.0	3	53.25	28	48.7	10	41.98	44	35.
Sept. 6.7	52.60	116	7.0	24	5.61	29	6.3	7	53.53	26	49.7	7	42.42	41	37.
16.6	53.76	105	9.4	27	5.90	27	7.0	13	53.79	23	50.4	5	42.83	37	39.
26.6	54.81	92	12.1	29	6.17	22	8.3	18	54.02	21	50.9	2	43.20	34	42.
Oct. 6.6	55.73	78	15.0	32	6.39	19	10.1	22	54.23	18	51.1	0	43.54	29	44.
16.6	56.51	63	18.2	33	6.58	14	12.3	24	54.41	15	51.1	2	43.83	24	46.
26.5	57.14	46	21.5	35	6.72	10	14.7	26	54.56	12	50.9	5	44.07	20	49.
Nov. 5.5	57.60	27	25.0	34	6.82	5	17.3	28	54.68	10	50.4	6	44.27	14	51.
15.5	57.87	7	28.4	33	6.87	0	20.1	28	54.78	6	49.8	6	44.41	9	53.
25.4	57.94	11	31.7	32	6.87	3	22.9	26	54.84	3	49.2	8	44.50	4	56.
Dec. 5.4	57.83	31	34.9	29	6.84	8	25.5	24	54.87	0	48.4	8	44.54	3	58.
15.4	57.52	49	37.8	26	6.76	12	27.9	21	54.87	3	47.6	7	44.51	8	60.1
25.4	57.03	67	40.4	22	6.64	15	30.0	18	54.84	6	46.9	8	44.43	13	61.7
35.3	56.36		42.6		6.49		31.8		54.78		46.1		44.30		62.9
Sec δ, Tan δ	5.283		+5.188		1.318		−0.858		1.002		+0.066		1.669		+1.3
Mean Place	$43^s.904$		$3''.53$		$2^s.411$		$41''.34$		$50^s.056$		$24''.85$		$37^s.879$		$28''.2$
$D'_\psi \alpha$, $D_\omega \alpha$	+0.09		−0.25		−0.02		+0.04		0.00		0.00		+0.02		−0.0
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7

ean Solar Date.	τ³ Eridani. Mag. 4.2				ρ Persei. Var. 3.4–4.2				μ Horologii. Mag. 5.2				θ Hydri. Mag. 5.5			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 2 58		° ′ −23 56		h m 2 59		° ′ +38 30		h m 3 1		° ′ −60 3		h m 3 2		° ′ −72 13	
	s		″		s		″		s		″		s		″	
an. 0.3	40.16	11	85.4	14	44.89	11	58.7	5	38.84	33	68.1	15	7.88	63	72.1	14
10.3	40.05	14	86.8	10	44.78	14	59.2	2	38.51	37	69.6	10	7.25	68	73.5	8
20.3	39.91	15	87.8	7	44.64	16	59.4	0	38.14	39	70.6	4	6.57	71	74.3	3
30.3	39.76	17	88.5	3	44.48	19	59.4	4	37.75	41	71.0	1	5.86	73	74.6	4
Feb. 9.2	39.59	18	88.8	0	44.29	19	59.0	6	37.34	41	70.9	7	5.13	73	74.2	9
19.2	39.41	17	88.8	4	44.10	19	58.4	9	36.93	39	70.2	13	4.40	70	73.3	14
Mar. 1.2	39.24	16	88.4	8	43.91	17	57.5	11	36.54	37	68.9	17	3.70	65	71.9	20
11.2	39.08	14	87.6	12	43.74	15	56.4	12	36.17	33	67.2	22	3.05	59	69.9	24
21.1	38.94	11	86.4	14	43.59	11	55.2	13	35.84	29	65.0	26	2.46	52	67.5	28
31.1	38.83	7	85.0	18	43.48	6	53.9	14	35.55	22	62.4	30	1.94	42	64.7	32
Apr. 10.1	38.76	3	83.2	20	43.42	1	52.5	13	35.33	16	59.4	32	1.52	31	61.5	34
20.0	38.73	1	81.2	23	43.41	5	51.2	13	35.17	8	56.2	35	1.21	20	58.1	36
30.0	38.74	6	78.9	25	43.46	10	49.9	10	35.09	1	52.7	36	1.01	8	54.5	36
May 10.0	38.80	11	76.4	26	43.56	16	48.9	9	35.08	7	49.1	36	0.93	4	50.9	37
20.0	38.91	15	73.8	27	43.72	22	48.0	6	35.15	15	45.5	36	0.97	17	47.2	37
29.9	39.06	20	71.1	27	43.94	26	47.4	3	35.30	23	41.9	35	1.14	28	43.5	35
June 8.9	39.26	23	68.4	27	44.20	31	47.1	1	35.53	29	38.4	33	1.42	40	40.0	32
18.9	39.49	27	65.7	26	44.51	34	47.0	3	35.82	35	35.1	30	1.82	49	36.8	30
28.9	39.76	29	63.1	24	44.85	37	47.3	5	36.17	40	32.1	27	2.31	58	33.8	26
July 8.8	40.05	31	60.7	22	45.22	38	47.8	8	36.57	45	29.4	22	2.89	65	31.2	20
18.8	40.36	31	58.5	19	45.60	39	48.6	10	37.02	47	27.2	17	3.54	69	29.2	16
28.8	40.67	32	56.6	15	45.99	39	49.6	13	37.49	49	25.5	12	4.23	73	27.6	10
Aug. 7.7	40.99	32	55.1	11	46.38	38	50.9	14	37.98	48	24.3	6	4.96	74	26.6	4
17.7	41.31	30	54.0	7	46.76	36	52.3	16	38.46	48	23.7	0	5.70	72	26.2	2
27.7	41.61	29	53.3	2	47.12	35	53.9	16	38.94	45	23.7	7	6.42	69	26.4	9
Sept. 6.7	41.90	26	53.1	2	47.47	33	55.5	18	39.39	41	24.4	12	7.11	63	27.3	14
16.6	42.16	24	53.3	7	47.80	30	57.3	18	39.80	37	25.6	18	7.74	55	28.7	20
26.6	42.40	21	54.0	11	48.10	26	59.1	17	40.17	31	27.4	22	8.29	46	30.7	25
Oct. 6.6	42.61	18	55.1	14	48.36	24	60.8	18	40.48	24	29.6	27	8.75	35	33.2	28
16.6	42.79	14	56.5	17	48.60	20	62.6	17	40.72	17	32.3	30	9.10	23	36.0	31
26.5	42.93	11	58.2	20	48.80	16	64.3	17	40.89	10	35.3	31	9.33	10	39.1	33
Nov. 5.5	43.04	7	60.2	21	48.96	13	66.0	16	40.99	2	38.4	33	9.43	3	42.4	34
15.5	43.11	4	62.3	22	49.09	8	67.6	14	41.01	5	41.7	32	9.40	16	45.8	32
25.4	43.15	0	64.5	21	49.17	4	69.0	13	40.96	12	44.9	30	9.24	29	49.0	30
Dec. 5.4	43.15	3	66.6	20	49.21	0	70.3	11	40.84	19	47.9	27	8.95	40	52.0	27
15.4	43.12	7	68.6	18	49.21	4	71.4	8	40.65	25	50.6	24	8.55	49	54.7	23
25.4	43.05	9	70.4	15	49.17	8	72.2	7	40.40	31	53.0	19	8.06	59	57.0	18
35.3	42.96		71.9		49.09		72.9		40.09		54.9		7.47		58.8	
Sec δ, Tan δ	1.094		−0.444		1.278		+0.796		2.004		−1.736		3.277		−3.120	
Mean Place	$38^{s}.655$		85″.18		$43^{s}.446$		41″.80		$36^{s}.362$		60″.91		$4^{s}.123$		63″.81	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.01		+0.02		+0.01		−0.04		−0.03		+0.08		−0.06		+0.15	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Trianguli. Mag. 3.1				55 Cassiopeiæ. Mag. 6.2				6 Persei. Mag. 5.4				ξ¹ Ceti. Mag. 4.5		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Decli- tion
	h m 2 4		° ′ +34 35		h m 2 7		° ′ +66 7		h m 2 7		° ′ +50 40		h m 2 8		° + 8
	s		″		s		″		s		″		s		″
Jan. 0.3	29.82		25.3		48.84		59.8		57.66		38.2		30.61		62.6
10.3	29.69	13	25.3	0	48.48	36	60.8	10	57.47	19	38.7	5	30.51	10	62.0
20.3	29.55	14	25.0	3	48.08	40	61.2	4	57.25	22	38.8	1	30.40	11	61.4
30.2	29.39	16	24.5	5	47.66	42	61.1	1	57.02	23	38.4	4	30.28	12	60.8
Feb. 9.2	29.22	17	23.7	8	47.24	42	60.4	7	56.77	25	37.7	7	30.15	13	60.3
19.2	29.05	17	22.7	10	46.83	41	59.2	12	56.54	23	36.5	12	30.02	13	59.8
Mar. 1.1	28.91	14	21.5	12	46.45	38	57.6	16	56.33	21	35.0	15	29.90	12	59.4
11.1	28.78	13	20.2	13	46.13	32	55.6	20	56.15	18	33.3	17	29.80	10	59.1
21.1	28.69	9	18.8	14	45.89	24	53.3	23	56.01	14	31.4	19	29.73	7	58.9
31.1	28.65	4	17.4	14	45.73	16	50.8	25	55.93	8	29.3	21	29.69	4	58.9
Apr. 10.0	28.65	0	16.1	13	45.67	6	48.2	26	55.91	2	27.3	20	29.69	0	59.1
20.0	28.70	5	15.0	11	45.72	5	45.7	25	55.97	6	25.4	19	29.73	4	59.4
30.0	28.81	11	14.1	9	45.87	15	43.3	24	56.09	12	23.6	18	29.82	9	60.0
May 10.0	28.97	16	13.4	7	46.13	26	41.0	23	56.28	19	22.0	16	29.95	13	60.8
19.9	29.18	21	13.0	4	46.49	36	39.1	19	56.54	26	20.8	12	30.12	17	61.9
29.9	29.44	26	12.9	1	46.93	44	37.5	16	56.85	31	19.9	9	30.34	22	63.2
June 8.9	29.74	30	13.2	3	47.45	52	36.4	11	57.21	36	19.3	6	30.59	25	64.6
18.8	30.07	33	13.7	5	48.03	58	35.7	7	57.62	41	19.2	1	30.87	28	66.3
28.8	30.43	36	14.6	9	48.66	63	35.4	3	58.06	44	19.5	3	31.17	30	68.0
July 8.8	30.80	37	15.8	12	49.31	65	35.6	2	58.51	45	20.1	6	31.48	31	69.8
18.8	31.17	37	17.2	14	49.98	67	36.3	7	58.97	46	21.1	10	31.81	33	71.6
28.7	31.54	37	18.8	16	50.65	67	37.4	11	59.43	46	22.5	14	32.13	32	73.3
Aug. 7.7	31.91	37	20.6	18	51.30	65	39.0	16	59.88	45	24.2	17	32.44	31	75.0
17.7	32.25	34	22.6	20	51.93	63	40.9	19	60.31	43	26.2	20	32.73	29	76.6
27.7	32.58	33	24.6	20	52.51	58	43.2	23	60.71	40	28.4	22	33.01	28	78.0
Sept. 6.6	32.87	29	26.6	20	53.05	54	45.7	25	61.08	37	30.8	24	33.26	25	79.3
16.6	33.13	26	28.7	21	53.54	49	48.5	28	61.41	33	33.3	25	33.49	23	80.3
26.6	33.36	23	30.7	20	53.96	42	51.5	30	61.70	29	35.9	26	33.69	20	81.1
Oct. 6.5	33.56	20	32.7	20	54.31	35	54.7	32	61.95	25	38.5	26	33.86	17	81.7
16.5	33.72	16	34.6	19	54.59	28	57.9	32	62.15	20	41.1	26	33.99	13	82.0
26.5	33.84	12	36.3	17	54.80	21	61.1	32	62.30	15	43.7	26	34.10	11	82.2
Nov. 5.5	33.93	9	37.9	16	54.92	12	64.2	31	62.41	11	46.1	24	34.18	8	82.2
15.4	33.98	5	39.3	14	54.97	5	67.2	30	62.46	5	48.4	23	34.22	4	82.0
25.4	33.99	1	40.5	12	54.93	4	70.0	28	62.47	1	50.5	21	34.24	2	81.7
Dec. 5.4	33.97	2	41.5	10	54.82	11	72.5	25	62.43	4	52.3	18	34.23	1	81.3
15.4	33.92	5	42.2	7	54.63	19	74.7	22	62.34	9	53.8	15	34.19	4	80.8
25.3	33.84	8	42.7	5	54.37	26	76.4	17	62.21	13	55.0	12	34.13	6	80.3
35.3	33.73	11	42.9	2	54.04	33	77.7	13	62.04	17	55.7	7	34.05	8	79.7
Sec δ, Tan δ	1.215		+0.690		2.471		+2.260		1.578		+1.221		1.011		+0.14
Mean Place	28ˢ.842		8″.76		47ˢ.612		36″.26		56ˢ.608		17″.60		29ˢ.556		54″.17
D′ψ a, Dω a	+0.01		−0.04		+0.03		−0.13		+0.02		−0.07		0.00		−0.01
Dψ δ. Dω δ	+0.3		+0.5		+0.3		+0.5		+0.3		+0.5		+0.3		+0.5

ean Solar Date.	μ Fornacis. Mag. 5.2				γ Trianguli. Mag. 4.1				67 Ceti. Mag. 5.7				φ Eridani. Mag. 3.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	2 9		−31 6		2 12		+33 27		2 12		− 6 48		2 13		−51 53	
	s		″		s		″		s		″		s		″	
an. 0.3	10.99	15	84.8	10	16.41	12	32.9	0	45.71	10	44.9	8	30.10	26	87.7	10
10.3	10.84	16	85.8	6	16.29	14	32.9	2	45.61	12	45.7	7	29.84	28	88.7	5
20.3	10.68	17	86.4	2	16.15	16	32.7	5	45.49	13	46.4	5	29.56	29	89.2	1
30.2	10.51	18	86.6	2	15.99	17	32.2	7	45.36	13	46.9	3	29.27	28	89.1	7
eb. 9.2	10.33	17	86.4	6	15.82	16	31.5	10	45.23	13	47.2	2	28.99	28	88.4	11
19.2	10.16	15	85.8	10	15.66	15	30.5	11	45.10	13	47.4	1	28.71	26	87.3	16
lar. 1.2	10.01	14	84.8	14	15.51	13	29.4	12	44.97	10	47.3	4	28.45	23	85.7	21
11.1	9.87	11	83.4	17	15.38	9	28.2	13	44.87	8	46.9	5	28.22	19	83.6	25
21.1	9.76	7	81.7	20	15.29	6	26.9	13	44.79	5	46.4	8	28.03	14	81.1	28
31.1	9.69	3	79.7	23	15.23	0	25.6	12	44.74	2	45.6	11	27.89	9	78.3	31
pr. 10.0	9.66	1	77.4	26	15.23	4	24.4	11	44.72	3	44.5	13	27.80	3	75.2	33
20.0	9.67	6	74.8	27	15.27	10	23.3	9	44.75	8	43.2	15	27.77	3	71.9	35
30.0	9.73	11	72.1	29	15.37	15	22.4	6	44.83	12	41.7	16	27.80	10	68.4	35
lay 10.0	9.84	16	69.2	29	15.52	20	21.8	4	44.95	16	40.1	19	27.90	16	64.9	35
19.9	10.00	20	66.3	30	15.72	25	21.4	1	45.11	20	38.2	20	28.06	22	61.4	35
29.9	10.20	25	63.3	29	15.97	29	21.3	3	45.31	24	36.2	21	28.28	28	57.9	33
une 8.9	10.45	28	60.4	28	16.26	33	21.6	6	45.55	27	34.1	22	28.56	33	54.6	30
18.9	10.73	31	57.6	26	16.59	35	22.2	8	45.82	29	31.9	21	28.89	36	51.6	27
28.8	11.04	32	55.0	23	16.94	36	23.0	11	46.11	30	29.8	21	29.25	40	48.9	23
uly 8.8	11.36	34	52.7	20	17.30	37	24.1	14	46.41	32	27.7	19	29.65	42	46.6	19
18.8	11.70	34	50.7	16	17.67	37	25.5	16	46.73	31	25.8	18	30.07	42	44.7	14
28.7	12.04	33	49.1	12	18.04	36	27.1	17	47.04	31	24.0	15	30.49	42	43.3	8
ug. 7.7	12.37	32	47.9	7	18.40	34	28.8	19	47.35	29	22.5	13	30.91	40	42.5	2
17.7	12.69	30	47.2	2	18.74	33	30.7	19	47.64	28	21.2	10	31.31	39	42.3	3
27.7	12.99	27	47.0	2	19.07	30	32.6	20	47.92	25	20.2	7	31.70	34	42.6	9
Sept. 6.6	13.26	24	47.2	7	19.37	26	34.6	19	48.17	22	19.5	3	32.04	31	43.5	14
16.6	13.50	21	47.9	12	19.63	24	36.5	20	48.39	20	19.2	0	32.35	26	44.9	19
26.6	13.71	17	49.1	15	19.87	20	38.5	19	48.59	17	19.2	2	32.61	20	46.8	23
Oct. 6.6	13.88	13	50.6	18	20.07	17	40.4	18	48.76	13	19.4	6	32.81	15	49.1	26
16.5	14.01	8	52.4	20	20.24	13	42.2	16	48.89	10	20.0	8	32.96	8	51.7	28
26.5	14.09	5	54.4	22	20.37	9	43.8	15	48.99	8	20.8	9	33.04	3	54.5	30
Nov. 5.5	14.14	2	56.6	23	20.46	6	45.3	13	49.07	4	21.7	11	33.07	3	57.5	29
15.4	14.16	3	58.9	22	20.52	3	46.6	12	49.11	1	22.8	11	33.04	8	60.4	28
25.4	14.13	6	61.1	20	20.55	1	47.8	9	49.12	1	23.9	12	32.96	13	63.2	25
Dec. 5.4	14.07	8	63.1	19	20.54	4	48.7	7	49.11	5	25.1	11	32.83	18	65.7	22
15.4	13.99	11	65.0	16	20.50	8	49.4	5	49.06	6	26.2	10	32.65	21	67.9	18
25.3	13.88	14	66.6	13	20.42	11	49.9	2	49.00	9	27.2	10	32.44	25	69.7	14
35.3	13.74		67.9		20.31		50.1		48.91		28.2		32.19		71.1	
ec δ, Tan δ	1.168		−0.604		1.199		+0.661		1.007		−0.119		1.621		−1.275	
ean Place	9ˢ.631		80″.88		15ˢ.373		16″.74		44ˢ.552		48″.36		28ˢ.273		79″.30	
$D_\psi \alpha$, $D_\omega \alpha$	−0.01		+0.03		+0.01		−0.04		0.00		+0.01		−0.02		+0.07	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.5		+0.3		+0.5		+0.3		+0.5		+0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*o* Ceti. (*Mira.*) Var. 1.7–9.6				κ Fornacis. Mag. 5.4				δ Hydri. Mag. 4.3				ι Cassiopeiæ. Mag. 4.6		
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declin- tion N
	h m		° ′		h m		° ′		h m		° ′		h m		°
	2 15		− 3 21		2 18		−24 11		2 20		−69 2		2 22		+67
	s		″		s		″		s		″		s		″
Jan. 0.3	4.24	10	42.1	8	40.48	13	69.8	10	16.82	54	55.8	8	4.22	36	39.3
10.3	4.14	11	42.9	6	40.35	14	70.8	7	16.28	57	56.6	3	3.86	41	40.5
20.3	4.03	13	43.5	6	40.21	15	71.5	4	15.71	58	56.9	3	3.45	44	41.1
30.2	3.90	13	44.1	4	40.06	16	71.9	0	15.13	57	56.6	9	3.01	44	41.1
Feb. 9.2	3.77	13	44.5	2	39.90	16	71.9	3	14.56	56	55.7	15	2.57	44	40.7
19.2	3.64	12	44.7	0	39.74	15	71.6	7	14.00	52	54.2	20	2.13	41	39.7
Mar. 1.2	3.52	11	44.7	2	39.59	13	70.9	10	13.48	46	52.2	25	1.72	35	38.2
11.1	3.41	8	44.5	4	39.46	10	69.9	14	13.02	40	49.7	28	1.37	29	36.3
21.1	3.33	5	44.1	6	39.36	8	68.5	17	12.62	33	46.9	32	1.08	19	34.1
31.1	3.28	1	43.5	8	39.28	3	66.8	19	12.29	23	43.7	34	0.89	9	31.7
Apr. 10.0	3.27	3	42.7	11	39.25	1	64.9	22	12.06	13	40.3	37	0.80	1	29.1
20.0	3.30	7	41.6	13	39.26	6	62.7	24	11.93	4	36.6	37	0.81	13	26.6
30.0	3.37	12	40.3	15	39.32	10	60.3	25	11.89	7	32.9	38	0.94	23	24.1
May 10.0	3.49	16	38.8	16	39.42	15	57.8	27	11.96	17	29.1	37	1.17	34	21.7
19.9	3.65	20	37.2	19	39.57	20	55.1	27	12.13	27	25.4	35	1.51	43	19.7
29.9	3.85	24	35.3	19	39.77	23	52.4	28	12.40	37	21.9	34	1.94	51	18.0
June 8.9	4.09	26	33.4	20	40.00	27	49.6	26	12.77	45	18.5	30	2.45	59	16.6
18.9	4.35	29	31.4	21	40.27	29	47.0	25	13.22	52	15.5	27	3.04	63	15.7
28.8	4.64	31	29.3	20	40.56	31	44.5	23	13.74	58	12.8	22	3.67	67	15.2
July 8.8	4.95	31	27.3	19	40.87	33	42.2	21	14.32	62	10.6	17	4.34	69	15.2
18.8	5.26	32	25.4	18	41.20	32	40.1	17	14.94	64	8.9	11	5.03	69	15.7
28.7	5.58	31	23.6	16	41.52	33	38.4	13	15.58	65	7.8	5	5.72	69	16.6
Aug. 7.7	5.89	29	22.0	13	41.85	31	37.1	10	16.23	64	7.3	0	6.41	66	17.9
17.7	6.18	28	20.7	11	42.16	29	36.1	5	16.87	60	7.3	7	7.07	62	19.7
27.7	6.46	25	19.6	8	42.45	27	35.6	0	17.47	55	8.0	12	7.69	59	21.8
Sept. 6.6	6.71	23	18.8	5	42.72	24	35.6	4	18.02	49	9.2	18	8.28	53	24.2
16.6	6.94	19	18.3	2	42.96	20	36.0	8	18.51	40	11.0	23	8.81	46	26.8
26.6	7.13	17	18.1	1	43.16	17	36.8	11	18.91	31	13.3	27	9.27	40	29.7
Oct. 6.6	7.30	14	18.2	4	43.33	14	37.9	15	19.22	21	16.0	29	9.67	33	32.8
16.5	7.44	11	18.6	5	43.47	10	39.4	17	19.43	10	18.9	32	10.00	25	35.9
26.5	7.55	7	19.1	8	43.57	7	41.1	19	19.53	1	22.1	32	10.25	17	39.1
Nov. 5.5	7.62	5	19.9	9	43.64	3	43.0	20	19.52	12	25.3	32	10.42	8	42.3
15.4	7.67	2	20.8	9	43.67	0	45.0	20	19.40	22	28.5	29	10.50	0	45.3
25.4	7.69	1	21.7	11	43.67	3	47.0	19	19.18	31	31.4	27	10.50	9	48.1
Dec. 5.4	7.68	4	22.8	10	43.64	7	48.9	18	18.87	39	34.1	23	10.41	17	50.8
15.4	7.64	7	23.8	9	43.57	9	50.7	15	18.48	47	36.4	18	10.24	24	53.1
25.3	7.57	8	24.7	9	43.48	11	52.2	13	18.01	51	38.2	12	10.00	33	55.0
35.3	7.49		25.6		43.37		53.5		17.50		39.4		9.67		56.4
Sec δ, Tan δ	1.002		−0.059		1.096		−0.449		2.796		−2.611		2.562		+2.358
Mean Place	3ˢ.092		46″.70		39ˢ.156		68″.11		13ˢ.900		45″.34		2ˢ.701		15″.85
D′ψ a Dω a	0.00		0.00		−0.01		+0.02		−0.04		+0.14		+0.04		−0.13
Dψ δ, Dω δ	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	ξ² Ceti. Mag. 4.3				σ Ceti. Mag. 4.8				86 H. Cassiopeiæ. Mag. 5.3				ν Ceti. Mag. 5.0			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 2 23		° ′ + 8 4		h m 2 28		° ′ −15 36		h m 2 29		° ′ +72 26		h m 2 31		° ′ + 5 13	
	s		″		s		″		s		″		s		″	
n. 0.3	39.39		55.2		4.72		60.1		57.31		74.9		25.87		30.4	
10.3	39.30	9	54.6	6	4.62	10	61.1	10	56.83	48	76.3	14	25.78	9	29.7	7
20.3	39.19	11	54.0	6	4.49	13	61.9	8	56.28	55	77.1	8	25.68	10	29.1	6
30.2	39.06	13	53.5	5	4.35	14	62.4	5	55.69	59	77.4	3	25.55	13	28.6	5
eb. 9.2	38.93	13	53.0	5	4.20	15	62.7	3	55.08	61	77.1	3	25.42	13	28.1	5
19.2	38.80	13	52.5	5	4.06	14	62.6	1	54.48	60	76.2	9	25.28	14	27.7	4
ar. 1.2	38.67	13	52.1	4	3.92	14	62.3	3	53.92	56	74.8	14	25.15	13	27.4	3
11.1	38.56	11	51.8	3	3.79	13	61.6	7	53.43	49	72.9	19	25.04	11	27.2	2
21.1	38.48	8	51.7	1	3.69	10	60.7	9	53.03	40	70.7	22	24.95	9	27.2	0
31.1	38.42	6	51.7	0	3.62	7	59.5	12	52.74	29	68.2	25	24.89	6	27.3	1
pr. 10.1	38.40	2	51.8	1	3.58	4	58.0	15	52.58	16	65.6	26	24.86	3	27.6	3
20.0	38.43	3	52.2	4	3.59	1	56.3	17	52.56	2	62.9	27	24.88	2	28.2	6
30.0	38.50	7	52.8	6	3.64	5	54.4	19	52.68	12	60.2	27	24.94	6	28.9	7
lay 10.0	38.62	12	53.6	8	3.74	10	52.2	22	52.93	25	57.6	26	25.05	11	29.9	10
19.9	38.78	16	54.7	11	3.89	15	49.9	23	53.32	39	55.3	23	25.20	15	31.1	12
29.9	38.98	20	55.9	12	4.07	18	47.6	23	53.84	52	53.3	20	25.39	19	32.4	13
une 8.9	39.22	24	57.3	14	4.30	23	45.1	25	54.46	62	51.7	16	25.63	24	34.0	16
18.9	39.49	27	58.9	16	4.55	25	42.7	24	55.17	71	50.5	12	25.89	26	35.6	16
28.8	39.79	30	60.6	17	4.83	28	40.4	23	55.95	78	49.8	7	26.18	29	37.4	18
uly 8.8	40.10	31	62.3	17	5.14	31	38.1	23	56.78	83	49.5	3	26.48	30	39.2	18
18.8	40.42	32	64.1	18	5.45	31	36.1	20	57.64	86	49.7	2	26.79	31	40.9	17
28.8	40.74	32	65.8	17	5.77	32	34.3	18	58.51	87	50.4	7	27.11	32	42.6	17
ug. 7.7	41.05	31	67.5	17	6.08	31	32.9	14	59.38	87	51.6	12	27.42	31	44.3	17
17.7	41.35	30	69.0	15	6.38	30	31.7	12	60.22	84	53.2	16	27.73	31	45.8	15
27.7	41.64	29	70.3	13	6.67	29	30.9	8	61.03	81	55.1	19	28.01	28	47.0	12
ept. 6.6	41.90	26	71.5	12	6.93	26	30.6	3	61.78	75	57.5	24	28.28	27	48.1	11
16.6	42.14	24	72.5	10	7.17	24	30.6	0	62.47	69	60.1	26	28.52	24	48.9	8
26.6	42.35	21	73.2	7	7.38	21	31.0	4	63.08	61	63.0	29	28.73	21	49.5	6
ct. 6.6	42.53	18	73.7	5	7.56	18	31.7	7	63.61	53	66.1	31	28.92	19	49.9	4
16.5	42.68	15	74.0	3	7.70	14	32.7	10	64.04	43	69.3	32	29.07	15	50.0	1
26.5	42.80	12	74.1	1	7.82	12	34.0	13	64.37	33	72.6	33	29.20	13	49.9	1
Nov. 5.5	42.89	9	74.1	0	7.90	8	35.5	15	64.59	22	75.9	33	29.30	10	49.6	3
15.5	42.95	6	73.8	3	7.95	5	37.1	16	64.71	12	79.2	33	29.37	7	49.2	4
25.4	42.99	4	73.5	3	7.97	2	38.7	16	64.71	0	82.3	31	29.41	4	48.7	5
Dec. 5.4	42.99	0	73.1	4	7.95	2	40.3	16	64.59	12	85.1	28	29.41	0	48.1	6
15.4	42.96	3	72.6	5	7.91	4	41.9	16	64.36	23	87.7	26	29.39	2	47.4	7
25.3	42.91	5	72.0	6	7.84	7	43.3	14	64.02	34	89.8	21	29.34	5	46.8	6
35.3	42.83	8	71.4	6	7.75	9	44.4	11	63.60	42	91.5	17	29.27	7	46.1	7
ec δ, Tan δ	1.010		+0.142		1.038		−0.279		3.317		+3.162		1.004		+0.091	
ean Place	38ˢ.244		46″.74		3ˢ.433		61″.26		55ˢ.347		50″.86		24ˢ.676		22″.74	
$V_\psi a$, $D_\omega a$	0.00		−0.01		0.00		+0.01		+0.05		−0.17		0.00		−0.01	
$_\psi\delta$, $D_\omega\delta$	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*μ* Hydri. Mag. 5.3				*ν* Arietis. Mag. 5.4				*δ* Ceti. Mag. 4.0				*ε* Hydri. Mag. 4.3		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decli tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	2 33		−79 28		2 33		+21 35		2 35		− 0 1		2 38		−68
	s		″		s		″		s		″		s		″
Jan. 0.3	31.91		59.8		60.39		52.6		8.69		69.0		19.67		61.1
10.3	30.75	116	60.7	9	60.30	9	52.4	2	8.61	8	69.7	7	19.15	52	62.2
20.3	29.52	123	61.0	3	60.18	12	52.1	3	8.50	11	70.4	7	18.60	55	62.7
30.2	28.26	126	60.6	4	60.05	13	51.6	5	8.37	13	71.0	6	18.02	58	62.7
Feb. 9.2	27.02	124	59.7	9	59.90	15	51.1	5	8.24	13	71.5	5	17.44	58	62.0
19.2	25.81	121	58.2	15	59.75	15	50.4	7	8.10	14	71.8	3	16.87	57	60.8
Mar. 1.2	24.67	114	56.2	20	59.61	14	49.7	7	7.97	13	71.9	1	16.34	53	59.1
11.1	23.64	103	53.8	24	59.49	12	48.9	8	7.85	12	71.9	0	15.85	49	56.9
21.1	22.73	91	50.9	29	59.39	10	48.2	7	7.75	10	71.7	2	15.41	44	54.2
31.1	21.97	76	47.7	32	59.32	7	47.5	7	7.69	6	71.3	4	15.05	36	51.2
Apr. 10.1	21.37	60	44.3	34	59.30	2	46.9	6	7.66	3	70.7	6	14.78	27	47.9
20.0	20.94	43	40.7	36	59.32	2	46.5	4	7.67	1	69.8	9	14.59	19	44.4
30.0	20.71	23	37.0	37	59.38	6	46.3	2	7.73	6	68.8	10	14.51	8	40.7
May 10.0	20.68	3	33.2	38	59.50	12	46.3	0	7.83	10	67.5	13	14.53	2	37.0
19.9	20.84	16	29.5	37	59.67	17	46.5	2	7.97	14	66.0	15	14.65	12	33.3
29.9	21.19	35	26.0	35	59.88	21	46.9	4	8.16	19	64.4	16	14.87	22	29.7
June 8.9	21.73	54	22.7	33	60.13	25	47.6	7	8.39	23	62.6	18	15.19	32	26.2
18.9	22.43	70	19.7	30	60.41	28	48.6	10	8.64	25	60.8	18	15.59	40	23.1
28.8	23.29	86	17.1	26	60.72	31	49.7	11	8.92	28	58.9	19	16.07	48	20.3
July 8.8	24.27	98	14.9	22	61.04	32	51.0	13	9.22	30	57.0	19	16.62	55	17.9
18.8	25.35	108	13.2	17	61.38	34	52.5	15	9.53	31	55.1	19	17.21	59	16.0
28.8	26.49	114	12.1	11	61.72	34	54.0	15	9.85	32	53.3	18	17.83	62	14.6
Aug. 7.7	27.66	117	11.6	5	62.05	33	55.6	16	10.16	31	51.7	16	18.47	64	13.8
17.7	28.83	117	11.7	1	62.37	32	57.2	16	10.46	30	50.3	14	19.10	63	13.6
27.7	29.95	112	12.4	7	62.68	31	58.8	16	10.74	28	49.2	11	19.71	61	14.1
Sept. 6.6	30.99	104	13.7	13	62.96	28	60.4	16	11.00	26	48.3	9	20.28	57	15.2
16.6	31.92	93	15.5	18	63.22	26	61.8	14	11.24	24	47.7	6	20.78	50	16.8
26.6	32.70	78	17.8	23	63.46	24	63.1	13	11.46	22	47.3	4	21.21	43	18.9
Oct. 6.6	33.30	60	20.5	27	63.66	20	64.3	12	11.65	19	47.3	0	21.56	35	21.
16.5	33.69	39	23.6	31	63.84	18	65.3	10	11.81	16	47.5	2	21.81	25	24.4
26.5	33.88	19	26.8	32	63.98	14	66.2	9	11.93	12	47.8	3	21.96	15	27.5
Nov. 5.5	33.84	4	30.0	32	64.09	11	67.0	8	12.03	10	48.4	6	22.00	4	30.
15.5	33.57	27	33.3	33	64.17	8	67.6	6	12.10	7	49.2	8	21.93	7	34.0
25.4	33.10	47	36.3	30	64.22	5	68.0	4	12.14	4	50.0	8	21.76	17	37.1
Dec. 5.4	32.42	68	39.0	27	64.24	2	68.3	3	12.15	1	50.9	9	21.49	27	40.
15.4	31.57	85	41.3	23	64.22	2	68.5	2	12.13	2	51.8	9	21.14	35	42.5
25.3	30.57	100	43.1	18	64.17	5	68.5	0	12.08	5	52.7	9	20.71	43	44.5
35.3	29.46	111	44.4	13	64.10	7	68.4	1	12.00	8	53.5	8	20.22	49	46.0
Sec *δ*, Tan *δ*	5.475		−5.383		1.076		+0.396		1.000		−0.001		2.744		−2.5
Mean Place	26ˢ.416		49″.47		59ˢ.203		39″.96		7ˢ.461		75″.01		16ˢ.634		51″.6
$D'_\psi \alpha$, $D_\omega \alpha$	−0.09		+0.28		+0.01		−0.02		0.00		0.00		−0.04		+0.1
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Persei. Mag. 4.2				γ Ceti *seq.* Mag. 3.7				π Ceti. Mag. 4.4				μ Ceti. Mag. 4.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 2 38		° ′ +48 52		h m 2 38		° ′ + 2 52		h m 2 40		° ′ −14 12		h m 2 40		° ′ + 9 45	
	s		″		s		″		s		″		s		″	
an. 0.3	24.55	16	30.8	7	54.91	9	48.4	7	5.90	10	63.3	11	21.91	9	30.6	6
10.3	24.39	19	31.5	4	54.82	11	47.7	6	5.80	12	64.4	8	21.82	10	30.0	5
20.3	24.20	22	31.9	1	54.71	12	47.1	6	5.68	14	65.2	6	21.72	12	29.5	5
30.3	23.98	23	31.8	5	54.59	14	46.5	5	5.54	15	65.8	3	21.60	14	29.0	5
Feb. 9.2	23.75	24	31.3	8	54.45	14	46.0	4	5.39	15	66.1	0	21.46	14	28.5	5
19.2	23.51	22	30.5	12	54.31	13	45.6	2	5.24	15	66.1	2	21.32	13	28.0	4
Mar. 1.2	23.29	20	29.3	14	54.18	12	45.4	1	5.09	13	65.9	5	21.19	12	27.6	4
11.1	23.09	16	27.9	17	54.06	10	45.3	1	4.96	11	65.4	9	21.07	10	27.2	2
21.1	22.93	11	26.2	18	53.96	7	45.4	2	4.85	8	64.5	11	20.97	7	27.0	1
31.1	22.82	5	24.4	19	53.89	3	45.6	5	4.77	4	63.4	13	20.90	3	26.9	1
Apr. 10.1	22.77	1	22.5	18	53.86	1	46.1	6	4.73	0	62.1	17	20.87	1	27.0	2
20.0	22.78	8	20.7	18	53.87	6	46.7	9	4.73	4	60.4	18	20.88	6	27.2	5
30.0	22.86	14	18.9	16	53.93	10	47.6	11	4.77	9	58.6	20	20.94	10	27.7	7
May 10.0	23.00	21	17.3	13	54.03	14	48.7	13	4.86	13	56.6	22	21.04	15	28.4	9
20.0	23.21	27	16.0	10	54.17	19	50.0	14	4.99	17	54.4	23	21.19	19	29.3	11
29.9	23.48	33	15.0	7	54.36	22	51.4	17	5.16	22	52.1	24	21.38	23	30.4	13
June 8.9	23.81	37	14.3	4	54.58	25	53.1	17	5.38	25	49.7	24	21.61	26	31.7	14
18.9	24.18	40	13.9	1	54.83	28	54.8	18	5.63	27	47.3	23	21.87	29	33.1	15
28.8	24.58	43	14.0	3	55.11	30	56.6	18	5.90	30	45.0	22	22.16	30	34.6	17
July 8.8	25.01	44	14.3	7	55.41	31	58.4	18	6.20	31	42.8	21	22.46	32	36.3	17
18.8	25.45	45	15.0	11	55.72	32	60.2	17	6.51	31	40.7	18	22.78	32	38.0	16
28.8	25.90	45	16.1	13	56.04	31	61.9	16	6.82	31	38.9	15	23.10	32	39.6	16
Aug. 7.7	26.35	44	17.4	16	56.35	30	63.5	14	7.13	31	37.4	12	23.42	31	41.2	15
17.7	26.79	41	19.0	19	56.65	29	64.9	12	7.44	29	36.2	8	23.73	29	42.7	13
27.7	27.20	39	20.9	20	56.94	27	66.1	10	7.73	26	35.4	5	24.02	27	44.0	12
Sept. 6.7	27.59	36	22.9	22	57.21	24	67.1	7	7.99	25	34.9	1	24.29	25	45.2	10
16.6	27.95	32	25.1	23	57.45	22	67.8	5	8.24	22	34.8	3	24.54	23	46.2	8
26.6	28.27	28	27.4	24	57.67	19	68.3	2	8.46	19	35.1	7	24.77	20	47.0	5
Oct. 6.6	28.55	24	29.8	24	57.86	16	68.5	0	8.65	15	35.8	10	24.97	17	47.5	4
16.5	28.79	20	32.2	23	58.02	14	68.5	3	8.80	13	36.8	12	25.14	14	47.9	1
26.5	28.99	15	34.5	23	58.16	10	68.2	4	8.93	9	38.0	14	25.28	11	48.0	0
Nov. 5.5	29.14	11	36.8	22	58.26	8	67.8	6	9.02	7	39.4	16	25.39	8	48.0	1
15.5	29.25	5	39.0	20	58.34	4	67.2	6	9.09	3	41.0	16	25.47	5	47.9	3
25.4	29.30	1	41.0	18	58.38	1	66.6	8	9.12	0	42.6	16	25.52	2	47.6	4
Dec. 5.4	29.31	4	42.8	16	58.39	2	65.8	8	9.12	3	44.2	15	25.54	1	47.2	4
15.4	29.27	9	44.4	13	58.37	4	65.0	8	9.09	6	45.7	14	25.53	4	46.8	5
25.4	29.18	13	45.7	9	58.33	7	64.2	7	9.03	9	47.1	12	25.49	7	46.3	6
35.3	29.05		46.6		58.26		63.5		8.94		48.3		25.42		45.7	
Sec δ, Tan δ	1.520		+1.145		1.001		+0.050		1.032		−0.253		1.015		+0.172	
Mean Place	23ˢ.193		11″.05		53ˢ.664		41″.43		4ˢ.561		65″.18		20ˢ.674		21″.47	
D′ψ α, Dω α	+0.02		−0.06		0.00		0.00		0.00		+0.01		0.00		−0.01	
Dψ δ, Dω δ	+0.3		+0.6		+0.3		+0.6		+0.3		+0.6		+0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Persei. Mag. 3.9				41 Arietis. Mag. 3.7				β Fornacis. Mag. 4.5				σ Arietis. Mag. 5.5		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decl tion
	h m		° ′		h m		° ′		h m		° ′		h m		
	2 44		+55 32		2 44		+26 54		2 45		−32 45		2 46		+1
	s		″		s		″		s		″		s		″
Jan. 0.3	30.76		57.9		59.85		53.4		33.55		47.9		49.08		67.
10.3	30.57	19	58.9	10	59.76	9	53.4	0	33.41	14	49.2	13	49.00	8	66.
20.3	30.33	24	59.5	6	59.64	12	53.2	2	33.25	16	50.1	9	48.89	11	66.
30.3	30.07	26	59.6	1	59.50	14	52.8	4	33.07	18	50.7	6	48.76	13	65.
Feb. 9.2	29.78	29	59.3	3	59.34	16	52.3	5	32.87	20	50.8	1	48.62	14	65.
19.2	29.49	29	58.5	8	59.18	16	51.7	6	32.68	19	50.4	4	48.48	14	64.
Mar. 1.2	29.22	27	57.3	12	59.03	15	50.9	8	32.49	19	49.7	7	48.34	14	64.
11.1	28.97	25	55.8	15	58.89	14	50.0	9	32.32	17	48.5	12	48.21	13	63.
21.1	28.77	20	54.0	18	58.78	11	49.1	9	32.17	15	46.9	16	48.10	11	63.
31.1	28.62	15	52.0	20	58.70	8	48.2	9	32.06	11	45.0	19	48.03	7	62.
Apr. 10.1	28.54	8	49.9	21	58.66	4	47.3	9	31.98	8	42.8	22	48.00	3	62.
20.0	28.53	1	47.8	21	58.67	1	46.6	7	31.95	3	40.3	25	48.00	0	62.
30.0	28.60	7	45.7	21	58.73	6	46.0	6	31.96	1	37.6	27	48.05	5	62.
May 10.0	28.75	15	43.8	19	58.84	11	45.7	3	32.03	7	34.7	29	48.15	10	63.
20.0	28.98	23	42.2	16	59.00	16	45.5	2	32.15	12	31.7	30	48.30	15	63.
29.9	29.27	29	40.8	14	59.21	21	45.6	1	32.32	17	28.7	30	48.49	19	64.
June 8.9	29.63	36	39.7	11	59.46	25	46.0	4	32.53	21	25.7	30	48.72	23	65.
18.9	30.04	41	39.0	7	59.75	29	46.6	6	32.78	25	22.8	29	48.98	26	66.
28.8	30.49	45	38.7	3	60.06	31	47.5	9	33.06	28	20.0	28	49.27	29	68.
July 8.8	30.97	48	38.8	1	60.39	33	48.6	11	33.37	31	17.5	25	49.58	31	69.
18.8	31.47	50	39.2	4	60.74	35	49.8	12	33.70	33	15.3	22	49.90	32	71.
28.8	31.98	51	40.1	9	61.09	35	51.2	14	34.03	33	13.5	18	50.23	33	72.
Aug. 7.7	32.49	51	41.3	12	61.44	35	52.7	15	34.37	34	12.1	14	50.55	32	74.
17.7	32.98	49	42.8	15	61.78	34	54.2	15	34.70	33	11.2	9	50.87	32	75.
27.7	33.46	48	44.6	18	62.10	32	55.8	16	35.02	32	10.8	4	51.17	30	77.
Sept. 6.7	33.90	44	46.6	20	62.40	30	57.4	16	35.32	30	10.9	1	51.45	28	78
16.6	34.32	42	48.9	23	62.68	28	58.9	15	35.59	27	11.5	6	51.71	26	7
26.6	34.69	37	51.3	24	62.93	25	60.4	15	35.83	24	12.5	10	51.94	23	8
Oct. 6.6	35.02	33	53.8	25	63.15	22	61.8	14	36.03	20	14.0	15	52.15	21	8
16.5	35.30	28	56.4	26	63.35	20	63.1	13	36.20	17	15.8	18	52.33	18	8
26.5	35.53	23	59.1	27	63.51	16	64.3	12	36.33	13	18.0	22	52.48	15	8
Nov. 5.5	35.71	18	61.7	26	63.64	13	65.3	10	36.42	9	20.3	23	52.60	12	8
15.5	35.84	13	64.2	25	63.74	10	66.2	9	36.47	5	22.7	24	52.69	9	8
25.4	35.90	6	66.5	23	63.80	6	66.9	7	36.48	1	25.2	25	52.75	6	8
Dec. 5.4	35.91	1	68.7	22	63.82	2	67.5	6	36.45	3	27.5	23	52.78	3	8
15.4	35.85	6	70.6	19	63.82	0	68.0	5	36.39	6	29.7	22	52.77	1	8
25.4	35.74	11	72.2	16	63.78	4	68.3	3	36.30	9	31.6	19	52.73	4	8
35.3	35.58	16	73.5	13	63.70	8	68.4	1	36.17	13	33.2	16	52.67	6	8
Sec δ, Tan δ	1.768		+1.458		1.121		+0.508		1.189		−0.643		1.034		+0
Mean Place	29ˢ.228		36″.93		58ˢ.582		39″.24		31ˢ.992		44″.94		47ˢ.812		56″
D′ψ α, Dω α	+0.03		−0.07		+0.01		−0.03		−0.01		+0.03		0.00		−0
Dψ δ, Dω δ	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	τ^2 **Eridani.** Mag. 4.8				τ **Persei.** Mag. 4.1				η **Eridani.** Mag. 4.0				ϵ **Arietis** (*mean*). Mag. 4.6			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	2 47		−21 20		2 48		+52 24		2 52		− 9 13		2 54		+21 0	
	s		″		s		″		s		″		s		″	
Jan. 0.3	12.32		73.4		14.85		76.0		17.83		65.4		22.20		16.1	
10.3	12.21	11	74.6	12	14.68	17	76.9	9	17.74	9	66.4	10	22.12	8	15.9	2
20.3	12.08	13	75.5	9	14.47	21	77.4	5	17.63	11	67.3	9	22.01	11	15.7	2
30.3	11.93	15	76.1	6	14.23	24	77.5	1	17.50	13	67.9	6	21.88	13	15.3	4
Feb. 9.2	11.77	16	76.4	3	13.97	26	77.2	3	17.36	14	68.3	4	21.73	15	14.8	5
19.2	11.60	17	76.3	1	13.71	26	76.4	8	17.21	15	68.5	2	21.58	15	14.2	6
Mar. 1.2	11.44	16	75.9	4	13.46	25	75.3	11	17.06	15	68.4	1	21.43	15	13.5	7
11.2	11.30	14	75.1	8	13.23	23	73.9	14	16.93	13	68.1	3	21.29	14	12.9	6
21.1	11.17	13	74.0	11	13.04	19	72.2	17	16.82	11	67.6	5	21.18	11	12.2	7
31.1	11.08	9	72.6	14	12.91	13	70.3	19	16.73	9	66.7	9	21.10	8	11.6	6
Apr. 10.1	11.02	6	71.0	16	12.83	8	68.4	19	16.68	5	65.7	10	21.05	5	11.1	5
20.0	11.00	2	69.0	20	12.82	1	66.4	20	16.67	1	64.4	13	21.05	0	10.7	4
30.0	11.03	3	66.8	22	12.88	6	64.5	19	16.70	3	62.8	16	21.10	5	10.5	2
May 10.0	11.10	7	64.4	24	13.02	14	62.7	18	16.78	8	61.1	17	21.20	10	10.5	0
20.0	11.22	12	61.9	25	13.23	21	61.2	15	16.90	12	59.2	19	21.34	14	10.7	2
29.9	11.39	17	59.3	26	13.50	27	59.9	13	17.07	17	57.1	21	21.53	19	11.1	4
June 8.9	11.60	21	56.7	26	13.83	33	58.9	10	17.28	21	55.0	21	21.76	23	11.7	6
18.9	11.84	24	54.0	27	14.22	39	58.3	6	17.52	24	52.8	22	22.03	27	12.5	8
28.9	12.11	27	51.5	25	14.64	42	58.1	2	17.78	26	50.6	22	22.33	30	13.6	11
July 8.8	12.41	30	49.2	23	15.09	45	58.3	2	18.07	29	48.5	21	22.64	31	14.8	12
18.8	12.72	31	47.1	21	15.56	47	58.8	5	18.38	31	46.5	20	22.97	33	16.1	13
28.8	13.04	32	45.2	19	16.04	48	59.6	8	18.69	31	44.7	18	23.31	34	17.5	14
Aug. 7.7	13.35	31	43.7	15	16.52	48	60.8	12	19.00	31	43.2	15	23.64	33	19.0	15
17.7	13.66	31	42.6	11	16.98	46	62.3	15	19.30	30	41.9	13	23.97	33	20.5	15
27.7	13.96	30	41.9	7	17.43	45	64.0	17	19.59	29	40.9	10	24.28	31	21.9	14
Sept. 6.7	14.24	28	41.7	2	17.85	42	66.0	20	19.86	27	40.3	6	24.58	30	23.3	14
16.6	14.49	25	41.9	2	18.24	39	68.2	22	20.12	26	40.1	2	24.85	27	24.6	13
26.6	14.72	23	42.5	6	18.60	36	70.5	23	20.34	22	40.2	1	25.10	25	25.8	12
Oct. 6.6	14.92	20	43.5	10	18.91	31	72.9	24	20.54	20	40.6	4	25.32	22	26.9	11
16.5	15.08	16	44.8	13	19.18	27	75.3	24	20.71	17	41.3	7	25.52	20	27.8	9
26.5	15.21	13	46.4	16	19.41	23	77.8	25	20.85	14	42.3	10	25.68	16	28.6	8
Nov. 5.5	15.31	10	48.2	18	19.58	17	80.2	24	20.96	11	43.5	12	25.82	14	29.2	6
15.5	15.38	7	50.1	19	19.71	13	82.6	24	21.04	8	44.8	13	25.92	10	29.7	5
25.4	15.41	3	52.1	20	19.78	7	84.8	22	21.09	5	46.2	14	25.99	7	30.1	4
Dec. 5.4	15.40	1	54.1	20	19.80	2	86.8	20	21.10	1	47.6	14	26.02	3	30.4	3
15.4	15.36	4	55.9	18	19.76	4	88.6	18	21.09	1	49.0	14	26.03	1	30.5	1
25.4	15.30	6	57.6	17	19.67	9	90.1	15	21.04	5	50.3	13	26.00	3	30.5	0
35.3	15.20	10	59.0	14	19.53	14	91.2	11	20.97	7	51.4	11	25.93	7	30.5	0
Sec δ, Tan δ	1.074		−0.391		1.640		+1.299		1.013		−0.163		1.071		+0.384	
Mean Place	$10^s.893$		73″.46		$13^s.337$		55″.69		$16^s.469$		68″.95		$20^s.884$		3″.66	
$D'_\psi a$, $D_\omega a$	−0.01		+0.02		+0.02		−0.06		0.00		+0.01		+0.01		−0.02	
$D_\psi\delta$, $D_\omega\delta$	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	47 H. Cephei. Mag. 5.7				θ Eridani. Mag. 3.4				α Ceti. Mag. 2.8				γ Persei. Mag. 3.1		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		
	h m 2 54		° ′ +79 5		h m 2 55		° ′ −40 38		h m 2 57		° ′ + 3 45		h m 2 58		° +53
	s		″		s		″		s		″		s		″
Jan. 0.3	47.60	75	27.4	18	4.15	17	45.6	15	51.39	8	32.3	7	39.53	17	48.4
10.3	46.85	88	29.2	14	3.98	20	47.1	10	51.31	10	31.6	7	39.36	21	49.4
20.3	45.97	97	30.6	7	3.78	21	48.1	6	51.21	12	30.9	5	39.15	24	50.1
30.3	45.00	102	31.3	1	3.57	23	48.7	1	51.09	14	30.4	5	38.91	26	50.3
Feb. 9.2	43.98	102	31.4	5	3.34	23	48.8	4	50.95	14	29.9	4	38.65	27	50.1
19.2	42.96	97	30.9	10	3.11	23	48.4	9	50.81	14	29.5	3	38.38	27	49.4
Mar. 1.2	41.99	89	29.9	16	2.88	21	47.5	14	50.67	13	29.2	1	38.11	24	48.4
11.2	41.10	75	28.3	20	2.67	18	46.1	17	50.54	11	29.1	0	37.87	20	47.1
21.1	40.35	60	26.3	24	2.49	15	44.4	21	50.43	8	29.1	2	37.67	15	45.4
31.1	39.75	40	23.9	27	2.34	11	42.3	25	50.35	5	29.3	4	37.52	10	43.6
Apr. 10.1	39.35	19	21.2	28	2.23	6	39.8	27	50.30	1	29.7	6	37.42	2	41.7
20.0	39.16	3	18.4	29	2.17	0	37.1	30	50.29	4	30.3	8	37.40	5	39.7
30.0	39.19	24	15.5	28	2.17	4	34.1	32	50.33	8	31.1	9	37.45	12	37.7
May 10.0	39.43	46	12.7	27	2.21	10	30.9	32	50.41	13	32.0	12	37.57	19	35.9
20.0	39.89	66	10.0	24	2.31	16	27.7	33	50.54	17	33.2	14	37.76	26	34.3
29.9	40.55	84	7.6	20	2.47	20	24.4	32	50.71	21	34.6	15	38.02	33	32.9
June 8.9	41.39	100	5.6	17	2.67	25	21.2	31	50.92	24	36.1	16	38.35	38	31.8
18.9	42.39	112	3.9	13	2.92	29	18.1	29	51.16	27	37.7	17	38.73	42	31.1
28.9	43.51	123	2.6	8	3.21	32	15.2	26	51.43	29	39.4	18	39.15	45	30.7
July 8.8	44.74	130	1.8	3	3.53	34	12.6	22	51.72	31	41.2	18	39.60	47	30.7
18.8	46.04	133	1.5	2	3.87	36	10.4	19	52.03	31	43.0	16	40.07	49	31.1
28.8	47.37	135	1.7	6	4.23	36	8.5	13	52.34	31	44.6	16	40.56	49	31.8
Aug. 7.7	48.72	134	2.3	12	4.59	35	7.2	9	52.65	31	46.2	14	41.05	47	32.9
17.7	50.06	130	3.5	15	4.94	35	6.3	3	52.96	29	47.6	11	41.52	46	34.2
27.7	51.36	124	5.0	20	5.29	32	6.0	3	53.25	28	48.7	10	41.98	44	35.8
Sept. 6.7	52.60	116	7.0	24	5.61	29	6.3	7	53.53	26	49.7	7	42.42	41	37.7
16.6	53.76	105	9.4	27	5.90	27	7.0	13	53.79	23	50.4	5	42.83	37	39.8
26.6	54.81	92	12.1	29	6.17	22	8.3	18	54.02	21	50.9	2	43.20	34	42.0
Oct. 6.6	55.73	78	15.0	32	6.39	19	10.1	22	54.23	18	51.1	0	43.54	29	44.3
16.6	56.51	63	18.2	33	6.58	14	12.3	24	54.41	15	51.1	2	43.83	24	46.7
26.5	57.14	46	21.5	35	6.72	10	14.7	26	54.56	12	50.9	5	44.07	20	49.2
Nov. 5.5	57.60	27	25.0	34	6.82	5	17.3	28	54.68	10	50.4	6	44.27	14	51.6
15.5	57.87	7	28.4	33	6.87	0	20.1	28	54.78	6	49.8	6	44.41	9	53.9
25.4	57.94	11	31.7	32	6.87	3	22.9	26	54.84	3	49.2	8	44.50	4	56.2
Dec. 5.4	57.83	31	34.9	29	6.84	8	25.5	24	54.87	0	48.4	8	44.54	3	58.2
15.4	57.52	49	37.8	26	6.76	12	27.9	21	54.87	3	47.6	7	44.51	8	60.1
25.4	57.03	67	40.4	22	6.64	15	30.0	18	54.84	6	46.9	8	44.43	13	61.7
35.3	56.36		42.6		6.49		31.8		54.78		46.1		44.30		62.9
Sec δ, Tan δ	5.283		+5.188		1.318		−0.858		1.002		+0.066		1.669		+1.33
Mean Place	43ˢ.904		3″.53		2ˢ.411		41″.34		50ˢ.056		24″.85		37ˢ.879		28″.24
D′ψ α, Dω α	+0.09		−0.25		−0.02		+0.04		0.00		0.00		+0.02		−0.06
Dψ δ, Dω δ	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7

ean Solar Date.	τ³ Eridani. Mag. 4.2				ρ Persei. Var. 3.4–4.2				μ Horologii. Mag. 5.2				θ Hydri. Mag. 5.5			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 2 58 s		° ′ −23 56 ″		h m 2 59 s		° ′ +38 30 ″		h m 3 1 s		° ′ −60 3 ″		h m 3 2 s		° ′ −72 13 ″	
an. 0.3	40.16		85.4		44.89		58.7		38.84		68.1		7.88		72.1	
10.3	40.05	11	86.8	14	44.78	11	59.2	5	38.51	33	69.6	15	7.25	63	73.5	14
20.3	39.91	14	87.8	10	44.64	14	59.4	2	38.14	37	70.6	10	6.57	68	74.3	8
30.3	39.76	15	88.5	7	44.48	16	59.4	0	37.75	39	71.0	4	5.86	71	74.6	3
eb. 9.2	39.59	17	88.8	3	44.29	19	59.0	4	37.34	41	70.9	1	5.13	73	74.2	4
19.2	39.41	18	88.8	0	44.10	19	58.4	6	36.93	41	70.2	7	4.40	73	73.3	9
ar. 1.2	39.24	17	88.4	4	43.91	19	57.5	9	36.54	39	68.9	13	3.70	70	71.9	14
11.2	39.08	16	87.6	8	43.74	17	56.4	11	36.17	37	67.2	17	3.05	65	69.9	20
21.1	38.94	14	86.4	12	43.59	15	55.2	12	35.84	33	65.0	22	2.46	59	67.5	24
31.1	38.83	11	85.0	14	43.48	11	53.9	13	35.55	29	62.4	26	1.94	52	64.7	28
pr. 10.1	38.76	7	83.2	18	43.42	6	52.5	14	35.33	22	59.4	30	1.52	42	61.5	32
20.0	38.73	3	81.2	20	43.41	1	51.2	13	35.17	16	56.2	32	1.21	31	58.1	34
30.0	38.74	1	78.9	23	43.46	5	49.9	13	35.09	8	52.7	35	1.01	20	54.5	36
ay 10.0	38.80	6	76.4	25	43.56	10	48.9	10	35.08	1	49.1	36	0.93	8	50.9	36
20.0	38.91	11	73.8	26	43.72	16	48.0	9	35.15	7	45.5	36	0.97	4	47.2	37
29.9	39.06	15	71.1	27	43.94	22	47.4	6	35.30	15	41.9	36	1.14	17	43.5	37
June 8.9	39.26	20	68.4	27	44.20	26	47.1	3	35.53	23	38.4	35	1.42	28	40.0	35
18.9	39.49	23	65.7	27	44.51	31	47.0	1	35.82	29	35.1	33	1.82	40	36.8	32
28.9	39.76	27	63.1	26	44.85	34	47.3	3	36.17	35	32.1	30	2.31	49	33.8	30
July 8.8	40.05	29	60.7	24	45.22	37	47.8	5	36.57	40	29.4	27	2.89	58	31.2	26
18.8	40.36	31	58.5	22	45.60	38	48.6	8	37.02	45	27.2	22	3.54	65	29.2	20
28.8	40.67	31	56.6	19	45.99	39	49.6	10	37.49	47	25.5	17	4.23	69	27.6	16
Aug. 7.7	40.99	32	55.1	15	46.38	39	50.9	13	37.98	49	24.3	12	4.96	73	26.6	10
17.7	41.31	32	54.0	11	46.76	38	52.3	14	38.46	48	23.7	6	5.70	74	26.2	4
27.7	41.61	30	53.3	7	47.12	36	53.9	16	38.94	48	23.7	0	6.42	72	26.4	2
Sept. 6.7	41.90	29	53.1	2	47.47	35	55.5	16	39.39	45	24.4	7	7.11	69	27.3	9
16.6	42.16	26	53.3	2	47.80	33	57.3	18	39.80	41	25.6	12	7.74	63	28.7	14
26.6	42.40	24	54.0	7	48.10	30	59.1	18	40.17	37	27.4	18	8.29	55	30.7	20
Oct. 6.6	42.61	21	55.1	11	48.36	26	60.8	17	40.48	31	29.6	22	8.75	46	33.2	25
16.6	42.79	18	56.5	14	48.60	24	62.6	18	40.72	24	32.3	27	9.10	35	36.0	28
26.5	42.93	14	58.2	17	48.80	20	64.3	17	40.89	17	35.3	30	9.33	23	39.1	31
Nov. 5.5	43.04	11	60.2	20	48.96	16	66.0	17	40.99	10	38.4	31	9.43	10	42.4	33
15.5	43.11	7	62.3	21	49.09	13	67.6	16	41.01	2	41.7	33	9.40	3	45.8	34
25.4	43.15	4	64.5	22	49.17	8	69.0	14	40.96	5	44.9	32	9.24	16	49.0	32
Dec. 5.4	43.15	0	66.6	21	49.21	4	70.3	13	40.84	12	47.9	30	8.95	29	52.0	30
15.4	43.12	3	68.6	20	49.21	0	71.4	11	40.65	19	50.6	27	8.55	40	54.7	27
25.4	43.05	7	70.4	18	49.17	4	72.2	8	40.40	25	53.0	24	8.06	49	57.0	23
35.3	42.96	9	71.9	15	49.09	8	72.9	7	40.09	31	54.9	19	7.47	59	58.8	18
Sec δ, Tan δ	1.094		−0.444		1.278		+0.796		2.004		−1.736		3.277		−3.120	
Mean Place	$38^{\rm s}.655$		$85''.18$		$43^{\rm s}.446$		$41''.80$		$36^{\rm s}.362$		$60''.91$		$4^{\rm s}.123$		$63''.81$	
$D'_{\psi}a$, $D_{\omega}a$	−0.01		+0.02		+0.01		−0.04		−0.03		+0.08		−0.06		+0.15	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Persei. (*Algol.*) Var. 2.1–3.2				δ Arietis. Mag. 4.5				12 Eridani. Mag. 4.0				48 H. Cephei. Mag. 5.5		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decl tion
	h m 3 2		° ′ +40 37		h m 3 6		° ′ +19 24		h m 3 8		° ′ −29 18		h m 3 9		° +77
	s		″		s		″		s		″		s		″
Jan. 0.4	39.42		61.8		47.32		33.6		29.17		79.2		33.12		49.5
		11		6		7		2		12		15		60	
10.3	39.31		62.4		47.25		33.4		29.05		80.7		32.52		51.5
		15		3		11		3		15		11		72	
20.3	39.16		62.7		47.14		33.1		28.90		81.8		31.80		52.9
		17		0		12		4		17		8		81	
30.3	38.99		62.7		47.02		32.7		28.73		82.6		30.99		53.8
		19		3		14		4		18		3		86	
Feb. 9.2	38.80		62.4		46.88		32.3		28.55		82.9		30.13		54.1
		20		6		16		5		19		1		88	
19.2	38.60		61.8		46.72		31.8		28.36		82.8		29.25		53.8
		20		9		15		6		19		5		86	
Mar. 1.2	38.40		60.9		46.57		31.2		28.17		82.3		28.39		52.9
		18		11		14		6		18		9		79	
11.2	38.22		59.8		46.43		30.6		27.99		81.4		27.60		51.5
		15		13		12		5		15		13		68	
21.1	38.07		58.5		46.31		30.1		27.84		80.1		26.92		49.6
		12		14		9		5		13		16		56	
31.1	37.95		57.1		46.22		29.6		27.71		78.5		26.36		47.3
		7		14		6		5		9		19		40	
Apr. 10.1	37.88		55.7		46.16		29.1		27.62		76.6		25.96		44.8
		1		14		1		3		6		23		21	
20.1	37.87		54.3		46.15		28.8		27.56		74.3		25.75		42.0
		4		14		3		1		0		25		3	
30.0	37.91		52.9		46.18		28.7		27.56		71.8		25.72		39.2
		11		12		9		0		4		27		17	
May 10.0	38.02		51.7		46.27		28.7		27.60		69.1		25.89		36.4
		16		9		13		2		10		28		36	
20.0	38.18		50.8		46.40		28.9		27.70		66.3		26.25		33.8
		22		8		18		5		14		29		53	
29.9	38.40		50.0		46.58		29.4		27.84		63.4		26.78		31.3
		26		5		22		7		19		29		70	
June 8.9	38.66		49.5		46.80		30.1		28.03		60.5		27.48		29.2
		31		1		25		8		23		29		84	
18.9	38.97		49.4		47.05		30.9		28.26		57.6		28.32		27.4
		35		1		29		11		26		28		96	
28.9	39.32		49.5		47.34		32.0		28.52		54.8		29.28		26.0
		37		4		31		11		29		25		105	
July 8.8	39.69		49.9		17.65		33.1		28.81		52.3		30.33		25.1
		39		7		32		13		31		23		113	
18.8	40.08		50.6		47.97		34.4		29.12		50.0		31.46		24.6
		40		10		33		14		32		20		118	
28.8	40.48		51.6		48.30		35.8		29.44		48.0		32.64		24.6
		40		11		33		14		33		15		119	
Aug. 7.8	40.88		52.7		48.63		37.2		29.77		46.5		33.83		25.0
		39		14		33		14		33		12		119	
17.7	41.27		54.1		48.96		38.6		30.10		45.3		35.02		25.9
		38		16		32		14		31		6		117	
27.7	41.65		55.7		49.28		40.0		30.41		44.7		36.19		27.3
		36		17		30		13		30		2		112	
Sept. 6.7	42.01		57.4		49.58		41.3		30.71		44.5		37.31		29.1
		33		17		27		12		28		4		106	
16.6	42.34		59.1		49.85		42.5		30.99		44.9		38.37		31.2
		31		19		26		10		25		8		97	
26.6	42.65		61.0		50.11		43.5		31.24		45.7		39.34		33.7
		28		18		23		10		23		13		87	
Oct. 6.6	42.93		62.8		50.34		44.5		31.47		47.0		40.21		36.5
		24		19		21		8		19		16		75	
16.6	43.17		64.7		50.55		45.3		31.66		48.6		40.96		39.5
		21		18		17		6		15		20		62	
26.5	43.38		66.5		50.72		45.9		31.81		50.6		41.58		42.7
		17		18		15		5		12		22		48	
Nov. 5.5	43.55		68.3		50.87		46.4		31.93		52.8		42.06		46.0
		14		17		11		4		8		23		32	
15.5	43.69		70.0		50.98		46.8		32.01		55.1		42.38		49.3
		9		15		8		2		4		24		16	
25.5	43.78		71.5		51.06		47.0		32.05		57.5		42.54		52.6
		4		14		5		2		0		24		2	
Dec. 5.4	43.82		72.9		51.11		47.2		32.05		59.9		42.52		55.8
		0		12		1		0		3		22		19	
15.4	43.82		74.1		51.12		47.2		32.02		62.1		42.33		58.7
		4		10		2		0		7		20		36	
25.4	43.78		75.1		51.10		47.2		31.95		64.1		41.97		61.3
		8		8		5		2		11		17		51	
35.3	43.70		75.9		51.05		47.0		31.84		65.8		41.46		63.6
Sec δ, Tan δ	1.318		+0.858		1.060		+0.352		1.147		−0.562		4.595		+4.484
Mean Place	37ˢ.936		44″.41		45ˢ.936		21″.70		27ˢ.562		78″.00		29ˢ.353		26″.39
D′ψ a, Dω a	+0.02		−0.04		+0.01		−0.02		−0.01		+0.03		+0.09		−0.20
Dψ δ, Dω δ	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Arietis. Mag. 5.0				38 Horologii (G.). Mag. 5.7				ζ Eridani. Mag. 4.9				τ Arietis. Mag. 5.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 10		+20 43		3 10		−57 37		3 11		−9 7		3 16		+20 50	
	s		″		s		″		s		″		s		″	
an. 0.4	2.15		60.6		26.15		89.0		43.65		61.1		20.45		41.0	
10.3	2.08	7	60.4	2	25.86	29	90.6	16	43.57	8	62.2	11	20.38	7	40.8	2
20.3	1.97	11	60.2	2	25.53	33	91.8	12	43.47	10	63.1	9	20.28	10	40.6	2
30.3	1.84	13	59.9	3	25.17	36	92.4	6	43.34	13	63.8	7	20.16	12	40.3	3
eb. 9.2	1.70	14	59.4	5	24.79	38	92.4	0	43.19	15	64.3	5	20.01	15	39.9	4
19.2	1.55	15	58.9	5	24.41	38	91.9	5	43.04	15	64.6	3	19.86	15	39.4	5
Mar. 1.2	1.39	16	58.3	6	24.04	37	90.8	11	42.89	15	64.6	0	19.70	16	38.9	5
11.2	1.25	14	57.7	6	23.69	35	89.2	16	42.74	15	64.3	3	19.56	14	38.3	6
21.1	1.12	13	57.1	6	23.38	31	87.1	21	42.62	12	63.8	5	19.43	13	37.7	6
31.1	1.03	9	56.6	5	23.11	27	84.6	25	42.52	10	63.0	8	19.33	10	37.2	5
Apr. 10.1	0.97	6	56.1	5	22.89	22	81.8	28	42.45	7	62.0	10	19.26	7	36.7	5
20.1	0.96	1	55.7	4	22.73	16	78.7	31	42.42	3	60.8	12	19.24	2	36.3	4
30.0	0.99	3	55.5	2	22.65	8	75.3	34	42.43	1	59.3	15	19.27	3	36.0	3
May 10.0	1.07	8	55.4	1	22.63	2	71.8	35	42.49	6	57.6	17	19.34	7	36.0	0
20.0	1.20	13	55.6	2	22.69	6	68.2	36	42.60	11	55.8	18	19.46	12	36.1	1
29.9	1.37	17	55.9	3	22.82	13	64.6	36	42.74	14	53.8	20	19.63	17	36.4	3
June 8.9	1.59	22	56.5	6	23.02	20	61.1	35	42.93	19	51.7	21	19.85	22	37.0	6
18.9	1.85	26	57.3	8	23.29	27	57.8	33	43.16	23	49.5	22	20.10	25	37.7	7
28.9	2.13	28	58.2	9	23.62	33	54.7	31	43.41	25	47.3	22	20.38	28	38.6	9
July 8.8	2.44	31	59.3	11	24.00	38	52.0	27	43.69	28	45.2	21	20.69	31	39.7	11
18.8	2.76	32	60.6	13	24.41	41	49.7	23	43.99	30	43.2	20	21.01	32	40.9	12
28.8	3.10	34	61.9	13	24.85	44	47.8	19	44.29	30	41.4	18	21.34	33	42.2	13
Aug. 7.8	3.43	33	63.2	13	25.31	46	46.5	13	44.60	31	39.8	16	21.68	34	43.5	13
17.7	3.76	33	64.6	14	25.77	46	45.8	7	44.91	31	38.5	13	22.01	33	44.8	13
27.7	4.08	32	66.0	14	26.22	45	45.7	1	45.20	29	37.6	9	22.33	32	46.2	14
Sept. 6.7	4.38	30	67.3	13	26.65	43	46.2	5	45.48	28	36.9	7	22.63	30	47.4	12
16.6	4.66	28	68.5	12	27.05	40	47.3	11	45.74	26	36.6	3	22.92	29	48.6	12
26.6	4.92	26	69.6	11	27.41	36	48.9	16	45.98	24	36.7	1	23.19	27	49.6	10
Oct. 6.6	5.16	24	70.6	10	27.72	31	51.1	22	46.20	22	37.1	4	23.43	24	50.6	10
16.6	5.37	21	71.4	8	27.96	24	53.7	26	46.39	19	37.8	7	23.64	21	51.4	8
26.5	5.55	18	72.1	7	28.15	19	56.6	29	46.54	15	38.8	10	23.83	19	52.1	7
Nov. 5.5	5.70	15	72.6	5	28.26	11	59.7	31	46.67	13	40.0	12	23.99	16	52.6	5
15.5	5.82	12	73.1	5	28.31	5	62.9	32	46.77	10	41.4	14	24.11	12	53.1	5
25.5	5.91	9	73.4	3	28.28	3	66.1	32	46.84	7	42.8	14	24.20	9	53.4	3
Dec. 5.4	5.96	5	73.6	2	28.19	9	69.2	31	46.87	3	44.3	15	24.26	6	53.6	2
15.4	5.97	1	73.8	2	28.03	16	72.0	28	46.87	0	45.8	15	24.28	2	53.7	1
25.4	5.95	2	73.8	0	27.82	21	74.4	24	46.84	3	47.1	13	24.27	1	53.7	0
35.3	5.90	5	73.7	1	27.55	27	76.4	20	46.78	6	48.4	13	24.22	5	53.7	0
Sec δ, Tan δ	1.069		+0.379		1.868		−1.578		1.013		−0.161		1.070		+0.381	
Mean Place	0ˢ.743		48″.35		23ˢ.763		82″.62		42ˢ.203		65″.10		19ˢ.010		28″.80	
$D_\psi a$, $D_\omega a$	+0.01		−0.02		−0.03		+0.07		0.00		+0.01		+0.01		−0.02	
$D_\psi \delta$, $D_\omega \delta$	+0.3		+0.7		+0.3		+0.7		+0.3		+0.7		+0.3		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*e* **Eridani.** Mag. 4.3				*ι* **Hydri.** Mag. 5.5				*α* **Persei.** Mag. 1.9				*o* **Tauri.** Mag. 3.8		
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Decli- tion
	h m 3 16 s		° ′ −43 23 ″		h m 3 17 s		° ′ −77 41 ″		h m 3 18 s		° ′ +49 33 ″		h m 3 20 s		° + 8 ″
Jan. 0.4	33.86		43.1		68.48		65.3		16.56		53.3		15.65		58.7
10.3	33.69	17	44.8	17	67.55	93	66.9	16	16.44	12	54.4	11	15.59	6	58.1
20.3	33.49	20	46.1	13	66.54	101	67.9	10	16.27	17	55.1	7	15.50	9	57.5
30.3	33.27	22	46.9	8	65.47	107	68.3	4	16.06	21	55.4	3	15.38	12	57.0
Feb. 9.3	33.03	24	47.1	2	64.37	110	68.1	2	15.83	23	55.3	1	15.24	14	56.5
19.2	32.78	25	46.9	2	63.27	110	67.4	7	15.58	25	54.9	4	15.09	15	56.1
Mar 1.2	32.54	24	46.2	7	62.20	107	66.1	13	15.33	25	54.1	8	14.94	15	55.8
11.2	32.31	23	45.0	12	61.19	101	64.2	19	15.10	23	52.9	12	14.80	14	55.5
21.1	32.10	21	43.3	17	60.26	93	62.0	22	14.90	20	51.5	14	14.68	12	55.3
31.1	31.92	18	41.3	20	59.43	83	59.3	27	14.74	16	50.0	15	14.58	10	55.3
Apr. 10.1	31.79	13	38.9	24	58.73	70	56.2	31	14.63	11	48.2	18	14.51	7	55.4
20.1	31.70	9	36.1	28	58.18	55	53.0	32	14.59	4	46.4	18	14.49	2	55.7
30.0	31.66	4	33.1	30	57.78	40	49.5	35	14.61	2	44.7	17	14.50	1	56.1
May 10.0	31.68	2	30.0	31	57.54	24	45.9	36	14.70	9	43.0	17	14.57	7	56.8
20.0	31.76	8	26.7	33	57.48	6	42.2	37	14.86	16	41.5	15	14.68	11	57.6
30.0	31.89	13	23.3	34	57.60	12	38.6	36	15.08	22	40.2	13	14.83	15	58.6
June 8.9	32.08	19	20.0	33	57.88	28	35.1	35	15.36	28	39.2	10	15.03	20	59.8
18.9	32.32	24	16.8	32	58.32	44	31.8	33	15.70	34	38.4	8	15.26	23	61.1
28.9	32.60	28	13.8	30	58.92	60	28.8	30	16.08	38	38.0	4	15.52	26	62.6
July 8.8	32.92	32	11.0	28	59.64	72	26.2	26	16.49	41	38.0	0	15.81	29	64.1
18.8	33.26	34	8.6	24	60.48	84	24.0	22	16.92	43	38.2	2	16.11	30	65.6
28.8	33.62	36	6.6	20	61.41	93	22.4	16	17.37	45	38.7	5	16.42	31	67.1
Aug. 7.8	34.00	38	5.0	16	62.39	98	21.3	11	17.83	46	39.6	9	16.74	32	68.6
17.7	34.37	37	4.0	10	63.40	101	20.8	5	18.28	45	40.7	11	17.05	31	69.9
27.7	34.74	37	3.6	4	64.41	101	20.9	1	18.72	44	42.1	14	17.35	30	71.1
Sept. 6.7	35.09	35	3.7	1	65.39	98	21.6	7	19.15	43	43.7	16	17.64	29	72.1
16.7	35.42	33	4.4	7	66.29	90	22.9	13	19.55	40	45.5	18	17.91	27	72.9
26.6	35.71	29	5.6	12	67.10	81	24.8	19	19.92	37	47.4	19	18.16	25	73.5
Oct. 6.6	35.98	27	7.3	17	67.78	68	27.2	24	20.26	34	49.5	21	18.39	23	73.9
16.6	36.20	22	9.5	22	68.31	53	30.0	28	20.56	30	51.6	21	18.60	21	74.1
26.5	36.38	18	12.0	25	68.67	36	33.1	31	20.82	26	53.7	21	18.78	18	74.1
Nov. 5.5	36.51	13	14.7	27	68.84	17	36.4	33	21.03	21	55.9	22	18.92	14	73.9
15.5	36.59	8	17.6	29	68.82	2	39.7	33	21.20	17	58.0	21	19.04	12	73.5
25.5	36.62	3	20.5	29	68.61	21	43.0	33	21.32	12	60.0	20	19.13	9	73.1
Dec. 5.4	36.61	1	23.3	28	68.21	40	46.1	31	21.39	7	61.9	19	19.19	6	72.6
15.4	36.55	6	25.9	26	67.64	57	48.9	28	21.40	1	63.6	17	19.21	2	72.0
25.4	36.44	11	28.3	24	66.92	72	51.3	24	21.36	4	65.1	15	19.20	1	71.5
35.4	36.30	14	30.3	20	66.06	86	53.3	20	21.26	10	66.4	13	19.15	5	70.9
Sec δ, Tan δ	1.376		−0.945		4.692		−4.585		1.542		+1.174		1.012		+0.154
Mean Place	$31^{s}.960$		$39''.34$		$63^{s}.138$		$57''.79$		$14^{s}.796$		$34''.51$		$14^{s}.212$		$49''.74$
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.02		+0.04		−0.09		+0.20		+0.02		−0.05		0.00		−0.01
$D'_{\psi}\delta$, $D_{\omega}\delta$	+0.3		+0.8		+0.3		+0.8		+0.3		+0.8		+0.3		+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**2 H. Camelop.** Mag. 4.4				**ξ Tauri.** Mag. 3.8				**f Tauri.** Mag. 4.3				**ε Eridani.** Mag. 3.8			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 22		+59 38		3 22		+ 9 26		3 26		+12 38		3 28		− 9 44	
	s		″		s		″		s		″		s		″	
an. 0.4	12.70	18	63.1	15	35.09	7	22.1	6	12.16	6	56.1	4	57.01	7	38.6	13
10.3	12.52	24	64.6	10	35.02	9	21.5	5	12.10	9	55.7	4	56.94	10	39.9	10
20.3	12.28	29	65.6	6	34.93	12	21.0	5	12.01	12	55.3	5	56.84	13	40.9	8
30.3	11.99	32	66.2	1	34.81	13	20.5	5	11.89	14	54.8	4	56.71	15	41.7	5
eb. 9.3	11.67	34	66.3	3	34.68	15	20.0	4	11.75	15	54.4	5	56.56	16	42.2	3
19.2	11.33	34	66.0	7	34.53	15	19.6	4	11.60	15	53.9	4	56.40	16	42.5	1
ar. 1.2	10.99	31	65.3	12	34.38	14	19.2	2	11.45	14	53.5	3	56.24	15	42.6	2
11.2	10.68	28	64.1	16	34.24	13	19.0	2	11.31	13	53.2	3	56.09	14	42.4	5
21.1	10.40	22	62.5	18	34.11	10	18.8	1	11.18	11	52.9	2	55.95	12	41.9	7
31.1	10.18	16	60.7	21	34.01	7	18.7	1	11.07	7	52.7	1	55.83	8	41.2	10
pr. 10.1	10.02	8	58.6	21	33.94	3	18.8	2	11.00	3	52.6	1	55.75	5	40.2	12
20.1	9.94	1	56.5	22	33.91	2	19.0	4	10.97	2	52.7	2	55.70	0	39.0	15
30.0	9.95	9	54.3	22	33.93	6	19.4	6	10.99	6	52.9	4	55.70	4	37.5	17
ay 10.0	10.04	18	52.1	20	33.99	11	20.0	8	11.05	11	53.3	6	55.74	8	35.8	18
20.0	10.22	26	50.1	18	34.10	15	20.8	10	11.16	15	53.9	7	55.82	13	34.0	20
30.0	10.48	33	48.3	16	34.25	20	21.8	11	11.31	19	54.6	10	55.95	17	32.0	21
une 8.9	10.81	40	46.7	12	34.45	23	22.9	13	11.50	23	55.6	11	56.12	21	29.9	22
18.9	11.21	46	45.5	9	34.68	26	24.2	14	11.73	27	56.7	12	56.33	24	27.7	21
28.9	11.67	50	44.6	5	34.94	29	25.6	15	12.00	29	57.9	14	56.57	27	25.6	21
uly 8.8	12.17	53	44.1	1	35.23	30	27.1	15	12.29	30	59.3	14	56.84	29	23.5	20
18.8	12.70	56	44.0	2	35.53	31	28.6	15	12.59	31	60.7	14	57.13	30	21.5	18
28.8	13.26	56	44.2	6	35.84	32	30.1	14	12.90	32	62.1	14	57.43	30	19.7	16
ug. 7.8	13.82	56	44.8	10	36.16	31	31.5	13	13.22	32	63.5	13	57.73	30	18.1	13
17.7	14.38	55	45.8	13	36.47	30	32.8	12	13.54	31	64.8	12	58.03	30	16.8	10
27.7	14.93	53	47.1	16	36.77	29	34.0	10	13.85	29	66.0	10	58.33	28	15.8	7
Sept. 6.7	15.46	50	48.7	19	37.06	28	35.0	9	14.14	28	67.0	9	58.61	27	15.1	3
16.7	15.96	47	50.6	21	37.34	25	35.9	6	14.42	26	67.9	8	58.88	25	14.8	1
26.6	16.43	43	52.7	23	37.59	23	36.5	4	14.68	24	68.7	5	59.13	23	14.9	4
Oct. 6.6	16.86	38	55.0	24	37.82	21	36.9	2	14.92	22	69.2	3	59.36	20	15.3	8
16.6	17.24	32	57.4	25	38.03	18	37.1	0	15.14	18	69.5	2	59.56	17	16.1	11
26.5	17.56	27	59.9	26	38.21	16	37.1	2	15.32	16	69.7	1	59.73	15	17.2	12
Nov. 5.5	17.83	21	62.5	26	38.37	12	36.9	2	15.48	13	69.8	1	59.88	11	18.4	15
15.5	18.04	14	65.1	26	38.49	9	36.7	4	15.61	10	69.7	2	59.99	8	19.9	15
25.5	18.18	8	67.7	24	38.58	6	36.3	5	15.71	6	69.5	3	60.07	5	21.4	16
Dec. 5.4	18.26	1	70.1	22	38.64	2	35.8	6	15.77	3	69.2	4	60.12	1	23.0	15
15.4	18.25	7	72.3	20	38.66	1	35.2	5	15.80	0	68.8	4	60.13	2	24.5	15
25.4	18.18	14	74.3	17	38.65	4	34.7	6	15.80	4	68.4	4	60.11	6	26.0	13
35.4	18.04		76.0		38.61		34.1		15.76		68.0		60.05		27.3	
ec δ, Tan δ	1.979		+1.708		1.014		+0.166		1.025		+0.224		1.015		−0.172	
ean Place	$10^{s}.563$		$42''.66$		$33^{s}.631$		$12''.97$		$10^{s}.686$		$46''.18$		$55^{s}.491$		$42''.81$	
$_\psi\alpha$, $D_\omega\alpha$	+0.03		−0.07		0.00		−0.01		0.00		−0.01		0.00		+0.01	
$_\psi\delta$, $D_\omega\delta$	+0.3		+0.8		+0.3		+0.8		+0.2		+0.8		+0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**τ^5 Eridani.** Mag. 4.3				**δ Persei.** Mag. 3.1				**δ Eridani.** Mag. 3.7				**ν Persei.** Mag. 3.9		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declin- tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	3 30		−21 54		3 36		+47 31		3 39		−10 2		3 39		+42
	s		″		s		″		s		″		s		″
Jan. 0.4	3.51		61.5		53.87		18.0		12.11		57.9		26.64		56.5
10.3	3.42	9	63.1	16	53.78	9	19.1	11	12.04	7	59.1	12	26.56	8	57.4
20.3	3.30	12	64.3	12	53.63	15	19.9	8	11.95	9	60.1	10	26.44	12	58.0
30.3	3.16	14	65.2	9	53.44	19	20.3	4	11.83	12	60.9	8	26.28	16	58.3
Feb. 9.3	2.99	17	65.8	6	53.22	22	20.4	1	11.68	15	61.5	6	26.09	19	58.3
19.2	2.82	17	66.0	2	52.99	23	20.1	3	11.52	16	61.9	4	25.88	21	58.0
Mar. 1.2	2.64	18	65.8	2	52.75	24	19.5	6	11.36	16	62.0	1	25.66	22	57.4
11.2	2.46	18	65.3	5	52.52	23	18.6	9	11.20	16	61.8	2	25.45	21	56.6
21.2	2.31	15	64.4	9	52.31	21	17.4	12	11.06	14	61.3	5	25.26	19	55.5
31.1	2.18	13	63.2	12	52.14	17	16.0	14	10.93	13	60.6	7	25.11	15	54.3
Apr. 10.1	2.08	10	61.7	15	52.02	12	14.4	16	10.84	9	59.6	10	25.00	11	52.9
20.1	2.01	7	60.0	17	51.96	6	12.7	17	10.79	5	58.4	12	24.94	6	51.5
30.0	2.00	1	57.9	21	51.96	0	11.1	16	10.78	1	56.9	15	24.94	0	50.1
May 10.0	2.03	3	55.6	23	52.02	6	9.5	16	10.81	3	55.3	16	25.00	6	48.8
20.0	2.10	7	53.2	24	52.15	13	8.1	14	10.89	8	53.4	19	25.12	12	47.6
30.0	2.23	13	50.6	26	52.35	20	6.8	13	11.01	12	51.4	20	25.30	18	46.6
June 8.9	2.39	16	48.0	26	52.60	25	5.7	11	11.17	16	49.3	21	25.53	23	45.8
18.9	2.60	21	45.4	26	52.90	30	5.0	7	11.37	20	47.1	22	25.82	29	45.3
28.9	2.84	24	42.8	26	53.25	35	4.5	5	11.61	24	44.9	22	26.14	32	45.0
July 8.9	3.11	27	40.3	25	53.64	39	4.3	2	11.87	26	42.8	21	26.50	36	45.0
18.8	3.40	29	38.1	22	54.05	41	4.4	1	12.15	28	40.8	20	26.88	38	45.3
28.8	3.71	31	36.1	20	54.48	43	4.8	4	12.45	30	39.0	18	27.28	40	45.8
Aug. 7.8	4.02	31	34.5	16	54.92	44	5.5	7	12.75	30	37.3	17	27.68	40	46.6
17.7	4.33	31	33.2	13	55.36	44	6.4	9	13.06	31	36.0	13	28.09	41	47.5
27.7	4.64	31	32.4	8	55.79	43	7.5	11	13.36	30	35.0	10	28.49	40	48.7
Sept. 6.7	4.94	30	32.0	4	56.21	42	8.9	14	13.65	29	34.3	7	28.88	39	50.0
16.7	5.22	28	32.0	0	56.61	40	10.4	15	13.92	27	34.0	3	29.25	37	51.4
26.6	5.47	25	32.5	5	56.99	38	12.1	17	14.18	26	34.1	1	29.60	35	52.9
Oct. 6.6	5.70	23	33.5	10	57.33	34	13.9	18	14.41	23	34.5	4	29.92	32	54.5
16.6	5.91	21	34.8	13	57.65	32	15.8	19	14.62	21	35.3	8	30.21	29	56.2
26.6	6.09	18	36.4	16	57.93	28	17.7	19	14.81	19	36.3	10	30.47	26	57.9
Nov. 5.5	6.23	14	38.3	19	58.17	24	19.6	19	14.96	15	37.6	13	30.70	23	59.5
15.5	6.33	10	40.4	21	58.36	19	21.6	20	15.09	13	39.1	15	30.88	18	61.1
25.5	6.40	7	42.6	22	58.50	14	23.4	18	15.18	9	40.7	16	31.02	14	62.7
Dec. 5.4	6.44	4	44.8	22	58.60	10	25.2	18	15.24	6	42.3	16	31.12	10	64.2
15.4	6.44	0	46.8	20	58.64	4	26.9	17	15.26	2	43.9	16	31.17	5	65.6
25.4	6.40	4	48.8	20	58.63	1	28.3	14	15.25	1	45.3	14	31.16	1	66.8
35.4	6.33	7	50.5	17	58.56	7	29.6	13	15.20	5	46.7	14	31.11	5	67.7
Sec δ, Tan δ	1.078		−0.402		1.481		+1.092		1.016		−0.177		1.352		+0.010
Mean Place	1^s.905		62″.76		51^s.984		0″.31		10^s.548		62″.13		24^s.843		39″.87
$D'_\psi \alpha$, $D_\omega \alpha$	−0.01		+0.02		+0.02		−0.04		0.00		+0.01		+0.02		−0.04
$D_\psi \delta$, $D_\omega \delta$	+0.2		+0.8		+0.2		+0.8		+0.2		+0.8		+0.2		+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	5 H. Camelop. Mag. 4.7				η Tauri. (*Alcyone*.) Mag. 3.0				τ^6 Eridani. Mag. 4.3				*g* Eridani. Mag. 4.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 3 41		° ′ +71 4		h m 3 42		° ′ +23 50		h m 3 43		° ′ −23 29		h m 3 46		° ′ −36 26	
	s		″		s		″		s		″		s		″	
n. 0.4	25.26		38.8		27.32		47.7		13.11		57.0		18.29		86.1	
10.4	24.96	30	40.9	21	27.27	5	47.7	0	13.02	9	58.7	17	18.17	12	88.0	19
20.3	24.57	39	42.5	16	27.18	9	47.7	0	12.90	12	60.0	13	18.01	16	89.6	16
30.3	24.09	48	43.6	11	27.06	12	47.5	2	12.75	15	61.0	10	17.82	19	90.7	11
eb. 9.3	23.56	53	44.2	6	26.92	14	47.3	2	12.58	17	61.7	7	17.61	21	91.4	7
19.2	23.00	56	44.2	0	26.76	16	46.9	4	12.40	18	62.0	3	17.39	22	91.6	2
ar. 1.2	22.43	57	43.7	5	26.59	17	46.4	5	12.21	19	62.0	0	17.16	23	91.3	3
11.2	21.88	55	42.6	11	26.43	16	45.9	5	12.03	18	61.5	5	16.93	23	90.6	7
21.2	21.39	49	41.1	15	26.28	15	45.3	6	11.86	17	60.7	8	16.72	21	89.5	11
31.1	20.98	41	39.2	19	26.16	12	44.7	6	11.72	14	59.6	11	16.54	18	87.9	16
pr. 10.1	20.66	32	37.0	22	26.07	9	44.1	6	11.60	12	58.1	15	16.39	15	86.0	19
20.1	20.45	21	34.6	24	26.03	4	43.6	5	11.53	7	56.3	18	16.28	11	83.7	23
30.1	20.37	8	32.0	26	26.03	0	43.2	4	11.50	3	54.2	21	16.22	6	81.1	26
ay 10.0	20.42	5	29.4	26	26.08	5	42.9	3	11.51	1	51.9	23	16.21	1	78.3	28
20.0	20.60	18	26.9	25	26.18	10	42.7	2	11.57	6	49.5	24	16.25	4	75.4	29
30.0	20.91	31	24.6	23	26.33	15	42.8	1	11.68	11	46.9	26	16.34	9	72.3	31
me 8.9	21.34	43	22.4	22	26.52	19	43.1	3	11.83	15	44.2	27	16.49	15	69.2	31
18.9	21.87	53	20.5	19	26.76	24	43.5	4	12.03	20	41.5	27	16.68	19	66.1	31
28.9	22.49	62	19.0	15	27.03	27	44.1	6	12.26	23	38.9	26	16.91	23	63.1	30
ly 8.9	23.19	70	17.8	12	27.32	29	44.9	8	12.52	26	36.5	24	17.18	27	60.3	28
18.8	23.95	76	17.1	7	27.64	32	45.8	9	12.80	28	34.2	23	17.48	30	57.8	25
28.8	24.75	80	16.8	3	27.97	33	46.8	10	13.10	30	32.2	20	17.80	32	55.7	21
ug. 7.8	25.58	83	16.9	1	28.31	34	47.9	11	13.41	31	30.5	17	18.13	33	53.9	18
17.7	26.42	84	17.4	5	28.65	34	49.0	11	13.72	31	29.2	13	18.47	34	52.7	12
27.7	27.25	83	18.3	9	28.98	33	50.2	12	14.03	31	28.3	9	18.81	34	51.9	8
ept 6.7	28.07	82	19.6	13	29.30	32	51.3	11	14.33	30	27.9	4	19.14	33	51.7	2
16.7	28.85	78	21.3	17	29.61	31	52.4	11	14.62	29	27.9	0	19.45	31	52.0	3
26.6	29.59	74	23.3	20	29.90	29	53.4	10	14.89	27	28.5	6	19.74	29	52.9	9
ct. 6.6	30.27	68	25.6	23	30.17	27	54.3	9	15.13	24	29.4	9	20.00	26	54.2	13
16.6	30.88	61	28.2	26	30.41	24	55.1	8	15.35	22	30.8	14	20.23	23	56.1	19
26.6	31.41	53	30.9	27	30.62	21	55.8	7	15.53	18	32.5	17	20.43	20	58.3	22
Nov. 5.5	31.85	44	33.8	29	30.81	19	56.4	6	15.69	16	34.5	20	20.59	16	60.8	25
15.5	32.20	35	36.8	30	30.97	16	57.0	6	15.81	12	36.7	22	20.71	12	63.5	27
25.5	32.43	23	39.8	30	31.09	12	57.4	4	15.89	8	39.0	23	20.78	7	66.4	29
Dec. 5.4	32.55	12	42.8	30	31.18	9	57.8	4	15.94	5	41.3	23	20.81	3	69.2	28
15.4	32.56	1	45.6	28	31.23	5	58.0	2	15.95	1	43.6	23	20.80	1	71.8	26
25.4	32.44	12	48.1	25	31.24	1	58.2	2	15.92	3	45.7	21	20.74	6	74.3	25
35.4	32.21	23	50.3	22	31.21	3	58.3	1	15.85	7	47.5	18	20.64	10	76.5	22
ec δ, Tan δ	3.083		+2.917		1.093		+0.442		1.091		−0.435		1.243		−0.739	
ean Place	21ˢ.890		17″.87		25ˢ.719		35″.18		11ˢ.433		58″.26		16ˢ.434		84″.91	
$y_\psi a$, $D_\omega a$	+0.06		−0.11		+0.01		−0.02		−0.01		+0.02		−0.02		+0.03	
$_\psi \delta$, $D_\omega \delta$	+0.2		+0.8		+0.2		+0.8		+0.2		+0.8		+0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Hydri. Mag. 3.2				ζ Persei. Mag. 2.9				9 H. Camelop. Mag. 5.2				ε Persei. Mag. 3.0		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declina tion N
	h m 3 48		° ′ −74 29		h m 3 48		° ′ +31 37		h m 3 49		° ′ +60 51		h m 3 52		° +39
	s		″		s		″		s		″		s		″
Jan. 0.4	37.03	66	64.3	20	48.81	5	69.6	5	55.29	15	58.8	18	10.60	7	70.7
10.4	36.37	75	66.3	15	48.76	9	70.1	2	55.14	22	60.6	13	10.53	11	71.5
20.3	35.62	82	67.8	10	48.67	13	70.3	1	54.92	28	61.9	9	10.42	14	72.1
30.3	34.80	86	68.8	3	48.54	16	70.4	1	54.64	32	62.8	5	10.28	18	72.4
Feb. 9.3	33.94	88	69.1	2	48.38	17	70.3	3	54.32	35	63.3	1	10.10	20	72.5
19.2	33.06	88	68.9	7	48.21	19	70.0	5	53.97	36	63.4	5	9.90	21	72.3
Mar. 1.2	32.18	84	68.2	14	48.02	18	69.5	6	53.61	35	62.9	9	9.69	20	71.8
11.2	31.34	80	66.8	18	47.84	16	68.9	8	53.26	32	62.0	13	9.49	19	71.1
21.2	30.54	73	65.0	23	47.68	13	68.1	8	52.94	27	60.7	16	9.30	15	70.2
31.1	29.81	64	62.7	26	47.55	10	67.3	9	52.67	20	59.1	19	9.15	12	69.1
Apr. 10.1	29.17	53	60.1	30	47.45	6	66.4	9	52.47	13	57.2	21	9.03	7	67.9
20.1	28.64	40	57.1	33	47.39	1	65.5	8	52.34	5	55.1	22	8.96	1	66.6
30.1	28.24	28	53.8	35	47.38	5	64.7	8	52.29	4	52.9	22	8.95	4	65.4
May 10.0	27.96	14	50.3	36	47.43	10	63.9	6	52.33	13	50.7	21	8.99	10	64.2
20.0	27.82	1	46.7	36	47.53	15	63.3	4	52.46	22	48.6	20	9.09	16	63.1
30.0	27.81	14	43.1	35	47.68	20	62.9	2	52.68	30	46.6	18	9.25	22	62.2
June 8.9	27.95	28	39.6	34	47.88	25	62.7	1	52.98	37	44.8	15	9.47	26	61.5
18.9	28.23	41	36.2	32	48.13	28	62.6	2	53.35	44	43.3	12	9.73	30	61.0
28.9	28.64	52	33.0	29	48.41	31	62.8	4	53.79	49	42.1	9	10.03	34	60.8
July 8.9	29.16	62	30.1	25	48.72	33	63.2	6	54.28	53	41.2	5	10.37	36	60.8
18.8	29.78	70	27.6	20	49.05	35	63.8	7	54.81	56	40.7	2	10.73	38	61.0
28.8	30.48	77	25.6	15	49.40	36	64.5	9	55.37	57	40.5	2	11.11	40	61.5
Aug. 7.8	31.25	81	24.1	9	49.76	36	65.4	10	55.94	59	40.7	6	11.51	39	62.2
17.8	32.06	83	23.2	4	50.12	36	66.4	11	56.53	58	41.3	9	11.90	39	63.0
27.7	32.89	81	22.8	3	50.48	34	67.5	11	57.11	57	42.2	12	12.29	38	64.0
Sept. 6.7	33.70	78	23.1	10	50.82	33	68.6	12	57.68	54	43.4	15	12.67	36	65.2
16.7	34.48	72	24.1	15	51.15	32	69.8	11	58.22	52	44.9	18	13.03	35	66.4
26.6	35.20	63	25.6	21	51.47	29	70.9	12	58.74	48	46.7	20	13.38	32	67.8
Oct. 6.6	35.83	52	27.7	26	51.76	27	72.1	11	59.22	44	48.7	22	13.70	30	69.2
16.6	36.35	40	30.3	29	52.03	24	73.2	11	59.66	39	50.9	23	14.00	27	70.6
26.6	36.75	26	33.2	32	52.27	21	74.3	10	60.05	34	53.2	25	14.27	23	72.1
Nov. 5.5	37.01	12	36.4	34	52.48	17	75.3	10	60.39	27	55.7	25	14.50	20	73.5
15.5	37.13	4	39.8	35	52.65	14	76.3	9	60.66	20	58.2	25	14.70	15	74.9
25.5	37.09	20	43.3	33	52.79	10	77.2	9	60.86	13	60.7	25	14.85	11	76.3
Dec. 5.5	36.89	33	46.6	31	52.89	6	78.1	7	60.99	5	63.2	23	14.96	6	77.6
15.4	36.56	47	49.7	28	52.95	1	78.8	6	61.04	3	65.5	22	15.02	2	78.8
25.4	36.09	60	52.5	23	52.96	3	79.4	5	61.01	11	67.7	19	15.04	4	79.9
35.4	35.49		54.8		52.93		79.9		60.90		69.6		15.00		80.9
Sec δ, Tan δ	3.741		−3.605		1.175		+0.616		2.054		+1.794		1.301		+0.832
Mean Place	$32^{s}.442$		58″.93		$47^{s}.105$		55″.55		$52^{s}.744$		39″.62		$8^{s}.747$		55″.06
$D'_{\psi} a$, $D_{\omega} a$	−0.08		+0.13		+0.01		−0.02		+0.04		−0.06		+0.02		−0.03
$D_{\psi} \delta$, $D_{\omega} \delta$	+0.2		+0.8		+0.2		+0.8		+0.2		+0.8		+0.2		+0.8

[Eph 15]

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ξ Persei. Mag. 4.0				γ Eridani. Mag. 3.2				λ Tauri. Var. 3.3–4.2				δ Reticuli. Mag. 4.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	3 53		+35 32		3 54		−13 44		3 55		+12 15		3 57		−61 37	
	s		″		s		″		s		″		s		″	
Jan. 0.4	28.55	6	65.4	6	5.43	6	55.0	14	59.77	4	13.1	4	26.53	30	86.7	23
10.4	28.49	10	66.0	5	5.37	10	56.4	12	59.73	7	12.7	4	26.23	36	89.0	18
20.3	28.39	13	66.5	2	5.27	12	57.6	10	59.66	11	12.3	5	25.87	40	90.8	12
30.3	28.26	16	66.7	0	5.15	15	58.6	7	59.55	13	11.8	4	25.47	44	92.0	6
Feb. 9.3	28.10	19	66.7	2	5.00	16	59.3	4	59.42	15	11.4	3	25.03	46	92.6	1
19.3	27.91	19	66.5	5	4.84	17	59.7	2	59.27	16	11.1	4	24.57	46	92.7	4
Mar. 1.2	27.72	19	66.0	7	4.67	17	59.9	2	59.11	16	10.7	3	24.11	45	92.3	10
11.2	27.53	18	65.3	8	4.50	16	59.7	5	58.95	14	10.4	2	23.66	43	91.3	16
21.2	27.35	15	64.5	9	4.34	13	59.2	8	58.81	12	10.2	2	23.23	39	89.7	20
31.1	27.20	11	63.6	11	4.21	11	58.4	10	58.69	10	10.0	1	22.84	33	87.7	24
Apr. 10.1	27.09	6	62.5	10	4.10	7	57.4	13	58.59	5	9.9	1	22.51	28	85.3	28
20.1	27.03	1	61.5	11	4.03	3	56.1	16	58.54	2	10.0	2	22.23	20	82.5	31
30.1	27.02	4	60.4	9	4.00	2	54.5	18	58.52	4	10.2	4	22.03	13	79.4	33
May 10.0	27.06	10	59.5	9	4.02	6	52.7	20	58.56	8	10.6	5	21.90	5	76.1	35
20.0	27.16	15	58.6	6	4.08	10	50.7	21	58.64	12	11.1	7	21.85	4	72.6	36
30.0	27.31	20	58.0	5	4.18	15	48.6	22	58.76	17	11.8	9	21.89	12	69.0	35
June 8.9	27.51	25	57.5	3	4.33	19	46.4	23	58.93	21	12.7	10	22.01	19	65.5	35
18.9	27.76	29	57.2	0	4.52	22	44.1	23	59.14	24	13.7	11	22.20	27	62.0	33
28.9	28.05	32	57.2	2	4.74	25	41.8	22	59.38	26	14.8	12	22.47	34	58.7	30
July 8.9	28.37	35	57.4	4	4.99	28	39.6	21	59.64	29	16.0	13	22.81	39	55.7	27
18.8	28.72	36	57.8	5	5.27	29	37.5	19	59.93	31	17.3	12	23.20	44	53.0	23
28.8	29.08	37	58.3	8	5.56	30	35.6	16	60.24	31	18.5	12	23.64	47	50.7	17
Aug. 7.8	29.45	38	59.1	9	5.86	30	34.0	14	60.55	32	19.7	12	24.11	50	49.0	11
17.8	29.83	37	60.0	10	6.16	30	32.6	10	60.87	31	20.9	11	24.61	50	47.9	6
27.7	30.20	36	61.0	11	6.46	30	31.6	6	61.18	30	22.0	9	25.11	49	47.3	0
Sept. 6.7	30.56	34	62.1	12	6.76	28	31.0	2	61.48	30	22.9	8	25.60	48	47.3	7
16.7	30.90	33	63.3	12	7.04	27	30.8	2	61.78	27	23.7	6	26.08	44	48.0	13
26.6	31.23	31	64.5	13	7.31	24	31.0	6	62.05	26	24.3	4	26.52	40	49.3	19
Oct. 6.6	31.54	29	65.8	12	7.55	22	31.6	9	62.31	24	24.7	2	26.92	35	51.2	23
16.6	31.83	25	67.0	13	7.77	20	32.5	13	62.55	21	24.9	0	27.27	28	53.5	28
26.6	32.08	22	68.3	12	7.97	17	33.8	15	62.76	19	24.9	1	27.55	20	56.3	32
Nov. 5.5	32.30	19	69.5	12	8.14	13	35.3	17	62.95	16	24.8	2	27.75	13	59.5	33
15.5	32.49	15	70.7	11	8.27	11	37.0	19	63.11	12	24.6	4	27.88	5	62.8	34
25.5	32.64	11	71.8	11	8.38	7	38.9	19	63.23	10	24.2	4	27.93	4	66.2	34
Dec. 5.5	32.75	6	72.9	9	8.45	3	40.8	18	63.33	6	23.8	4	27.89	11	69.6	32
15.4	32.81	2	73.8	9	8.48	0	42.6	18	63.39	2	23.4	4	27.78	19	72.8	29
25.4	32.83	3	74.7	7	8.48	5	44.4	16	63.41	2	23.0	5	27.59	27	75.7	25
35.4	32.80		75.4		8.43		46.0		63.39		22.5		27.32		78.2	
Sec δ, Tan δ	1.229		+0.715		1.029		−0.245		1.023		+0.217		2.105		−1.852	
Mean Place	26^{s}.756		50″.68		3^{s}.793		58″.63		58^{s}.159		3″.56		23^{s}.686		82″.80	
$D'_{\phi} a$, $D_{\omega} a$	+0.02		−0.03		−0.01		+0.01		0.00		−0.01		−0.04		+0.06	
$D_{\phi} \delta$, $D_{\omega} \delta$	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ν Tauri.** Mag. 3.9 Right Ascension.		Declination N.		**A Tauri.** Mag. 4.5 Right Ascension.		Declination N.		***c* Persei.** Mag. 4.0 Right Ascension.		Declination N.		**ρ Tauri.** Mag. 5.6 Right Ascension.		Declination N.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	3 58		+ 5 45		3 59		+21 51		4 2		+47 29		4 5		+26 1
	s		″		s		″		s		″		s		″
Jan. 0.4	39.61		23.4		41.73		13.7		31.25		28.4		40.83		48.4
10.4	39.57	4	22.6	8	41.69	4	13.7	0	31.18	7	29.6	12	40.79	4	48.6
20.3	39.50	7	22.0	6	41.62	7	13.6	1	31.06	12	30.5	9	40.72	7	48.7
30.3	39.39	11	21.4	6	41.51	11	13.4	2	30.89	17	31.2	7	40.61	11	48.8
Feb. 9.3	39.26	13	20.9	5	41.37	14	13.2	2	30.69	20	31.5	3	40.46	15	48.6
19.3	39.11	15	20.5	4	41.21	16	12.9	3	30.46	23	31.5	0	40.30	16	48.4
Mar. 1.2	38.96	15	20.2	3	41.05	16	12.5	4	30.21	25	31.1	4	40.13	17	48.0
11.2	38.80	16	20.0	2	40.88	17	12.0	5	29.97	24	30.4	7	39.95	18	47.5
21.2	38.66	14	19.9	1	40.73	15	11.6	4	29.75	22	29.4	10	39.79	16	47.0
31.1	38.53	13	20.0	1	40.60	13	11.1	5	29.56	19	28.2	12	39.65	14	46.4
Apr. 10.1	38.43	10	20.2	2	40.50	10	10.6	5	29.41	15	26.8	14	39.54	11	45.7
20.1	38.38	5	20.6	4	40.44	6	10.2	4	29.31	10	25.2	16	39.48	6	45.1
30.1	38.36	2	21.1	5	40.42	2	9.9	3	29.28	3	23.6	16	39.46	2	44.6
May 10.0	38.38	2	21.9	8	40.46	4	9.7	2	29.31	3	22.1	15	39.48	2	44.1
20.0	38.45	7	22.8	9	40.54	8	9.7	0	29.40	9	20.6	15	39.56	8	43.8
30.0	38.57	12	23.8	10	40.67	13	9.8	1	29.56	16	19.2	14	39.69	13	43.7
June 9.0	38.73	16	25.1	13	40.84	17	10.1	3	29.78	22	18.0	12	39.87	18	43.7
18.9	38.93	20	26.4	13	41.06	22	10.5	4	30.06	28	17.0	10	40.08	21	43.8
28.9	39.16	23	27.8	14	41.31	25	11.1	6	30.39	33	16.3	7	40.34	26	44.2
July 8.9	39.42	26	29.3	15	41.59	28	11.9	8	30.75	36	15.9	4	40.63	29	44.7
18.8	39.70	28	30.8	15	41.90	31	12.8	9	31.15	40	15.7	2	40.94	31	45.4
28.8	40.00	30	32.2	14	42.22	32	13.7	9	31.57	42	15.8	1	41.27	33	46.2
Aug. 7.8	40.30	30	33.6	14	42.55	33	14.7	10	32.00	43	16.2	4	41.60	33	47.0
17.8	40.61	31	34.8	12	42.88	33	15.8	11	32.44	44	16.8	6	41.94	34	47.9
27.7	40.92	31	35.8	10	43.21	33	16.8	10	32.88	44	17.6	8	42.29	35	48.9
Sept. 6.7	41.22	30	36.7	9	43.53	32	17.8	10	33.31	43	18.7	11	42.62	33	49.9
16.7	41.50	28	37.3	6	43.84	31	18.7	9	33.72	41	19.9	12	42.94	32	50.8
26.7	41.77	27	37.7	4	44.14	30	19.5	8	34.12	40	21.3	14	43.25	31	51.7
Oct. 6.6	42.03	26	37.8	1	44.41	27	20.2	7	34.49	37	22.8	15	43.54	29	52.5
16.6	42.26	23	37.7	1	44.67	26	20.8	6	34.84	35	24.5	17	43.81	27	53.3
26.6	42.47	21	37.4	3	44.90	23	21.4	6	35.15	31	26.2	17	44.05	24	54.0
Nov. 5.5	42.65	18	36.9	5	45.10	20	21.8	4	35.42	27	27.9	17	44.27	22	54.6
15.5	42.80	15	36.3	6	45.28	18	22.1	3	35.65	23	29.7	18	44.46	19	55.2
25.5	42.93	13	35.6	7	45.42	14	22.4	3	35.84	19	31.5	18	44.61	15	55.7
Dec. 5.5	43.02	9	34.8	8	45.52	10	22.6	2	35.97	13	33.3	18	44.72	11	56.2
15.4	43.08	6	34.0	8	45.59	7	22.7	1	36.05	8	35.0	17	44.80	8	56.6
25.4	43.10	2	33.2	8	45.61	2	22.8	1	36.07	2	36.5	15	44.83	3	56.9
35.4	43.08	2	32.4	8	45.60	1	22.8	0	36.03	4	37.8	13	44.82	1	57.2
Sec δ, Tan δ	1.005		+0.101		1.077		+0.401		1.480		+1.091		1.115		+0.493
Mean Place	38ˢ.001		15″.28		40ˢ.052		1″.99		29ˢ.150		11″.80		39ˢ.079		35″.98
D′ψ α, Dω α	0.00		0.00		+0.01		−0.01		+0.03		−0.04		+0.01		−0.02
Dψ δ, Dω δ	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.2		+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	o^1 **Eridani.** Mag. 4.1				μ **Tauri.** Mag. 4.3				α **Horologii.** Mag. 3.8				α **Reticuli.** Mag. 3.4			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 4 7 s		° ′ − 7 3 ″		h m 4 10 s		° ′ + 8 40 ″		h m 4 11 s		° ′ −42 29 ″		h m 4 13 s		° ′ −62 40 ″	
n. 0.4	44.59	4	25.0	12	56.70	3	57.7	6	13.15	13	74.5	23	22.52	30	74.1	24
10.4	44.55	8	26.2	11	56.67	7	57.1	6	13.02	17	76.8	19	22.22	36	76.5	20
20.3	44.47	11	27.3	9	56.60	10	56.5	5	12.85	21	78.7	14	21.86	41	78.5	14
30.3	44.36	14	28.2	7	56.50	13	56.0	4	12.64	24	80.1	10	21.45	45	79.9	9
b. 9.3	44.22	16	28.9	5	56.37	14	55.6	4	12.40	25	81.1	4	21.00	48	80.8	3
19.3	44.06	16	29.4	2	56.23	16	55.2	3	12.15	27	81.5	0	20.52	49	81.1	3
ar. 1.2	43.90	17	29.6	0	56.07	16	54.9	3	11.88	27	81.5	5	20.03	48	80.8	7
11.2	43.73	15	29,6	2	55.91	15	54.6	1	11.61	25	81.0	11	19.55	46	80.1	13
21.2	43.58	14	29.4	5	55.76	13	54.5	0	11.36	23	79.9	14	19.09	42	78.8	18
31.2	43.44	11	28.9	7	55.63	11	54.5	1	11.13	19	78.5	19	18.67	38	77.0	23
pr. 10.1	43.33	7	28.2	10	55.52	7	54.6	2	10.94	16	76.6	23	18.29	32	74.7	26
20.1	43.26	4	27.2	12	55.45	2	54.8	4	10.78	11	74.3	25	17.97	24	72.1	30
30.1	43.22	1	26.0	14	55.43	1	55.2	5	10.67	5	71.8	29	17.73	17	69.1	32
ay 10.0	43.23	5	24.6	16	55.44	6	55.7	7	10.62	0	68.9	30	17.56	9	65.9	34
20.0	43.28	10	23.0	18	55.50	11	56.4	9	10.62	5	65.9	32	17.47	0	62.5	36
30.0	43.38	14	21.2	19	55.61	16	57.3	10	10.67	11	62.7	33	17.47	9	58.9	35
ine 9.0	43.52	18	19.3	19	55.77	19	58.3	11	10.78	16	59.4	32	17.56	16	55.4	35
18.9	43.70	22	17.4	20	55.96	22	59.4	12	10.94	22	56.2	31	17.72	25	51.9	34
28.9	43.92	24	15.4	19	56.18	26	60.6	13	11.16	25	53.1	30	17.97	32	48.5	31
ly 8.9	44.16	27	13.5	19	56.44	27	61.9	14	11.41	29	50.1	27	18.29	37	45.4	27
18.9	44.43	28	11.6	18	56.71	30	63.3	13	11.70	32	47.4	23	18.66	43	42.7	24
28.8	44.71	30	9.8	16	57.01	30	64.6	12	12.02	34	45.1	19	19.09	48	40.3	19
ug. 7.8	45.01	30	8.2	13	57.31	31	65.8	11	12.36	35	43.2	14	19.57	50	38.4	13
17.8	45.31	30	6.9	10	57.62	31	66.9	11	12.71	36	41.8	9	20.07	51	37.1	8
27.7	45.61	30	5.9	7	57.93	30	68.0	8	13.07	35	40.9	3	20.58	51	36.3	1
ept. 6.7	45.91	28	5.2	4	58.23	30	68.8	6	13.42	34	40.6	2	21,09	50	36.2	5
16.7	46.19	27	4.8	0	58.53	28	69.4	4	13.76	33	40.8	9	21.59	47	36.7	12
26.7	46.46	25	4.8	3	58.81	26	69.8	2	14.09	30	41.7	14	22.06	43	37.9	17
ct. 6.6	46.71	24	5.1	7	59.07	24	70.0	0	14.39	27	43.1	19	22.49	38	39.6	23
16.6	46.95	21	5.8	10	59.31	22	70.0	2	14.66	23	45.0	23	22.87	31	41.9	27
26.6	47.16	18	6.8	12	59.53	20	69.8	3	14.89	19	47.3	27	23.18	24	44.6	31
ov. 5.6	47.34	15	8.0	14	59.73	17	69.5	5	15.08	15	50.0	29	23.42	16	47.7	33
15.5	47.49	12	9.4	15	59.90	14	69.0	6	15.23	9	52.9	31	23.58	8	51.0	35
25.5	47.61	9	10.9	15	60.04	10	68.4	7	15.32	5	56.0	31	23.66	0	54.5	34
ec. 5.5	47.70	6	12.4	16	60.14	7	67.7	7	15.37	0	59.1	30	23.66	10	57.9	33
15.4	47.76	1	14.0	15	60.21	3	67.0	7	15.37	5	62.1	28	23.56	17	61.2	31
25.4	47.77	2	15.5	14	60.24	0	66.3	6	15.32	11	64.9	25	23.39	26	64.3	27
35.4	47.75		16.9		60.24		65.7		15.21		67.4		23.13		67.0	
δ, Tan δ	1.008		−0.124		1.012		+0.153		1.356		−0.916		2.179		−1.936	
an Place	42ˢ.934		30″.28		55ˢ.033		49″.08		11ˢ.097		73″.56		19ˢ.541		71″.08	
α, $D_\omega \alpha$	0.00		0.00		0.00		0.00		−0.02		+0.03		−0.05		+0.06	
δ, $D_\omega \delta$	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*γ* **Tauri.** Mag. 3.9				*δ* **Tauri.** Mag. 3.9				υ^6 **Eridani.** Mag. 4.1				*ε* **Tauri.** Mag. 3.6		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decli tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	4 14		+15 25		4 18		+17 20		4 20		−34 12		4 23		+18
	s		″		s		″		s		″		s		″
Jan. 0.4	58.96		33.6		3.57		48.8		52.55		48.8		40.85		44.6
10.4	58.94	2	33.3	3	3.55	2	48.6	2	52.46	9	51.0	22	40.84	1	44.5
20.3	58.88	6	33.0	3	3.49	6	48.4	2	52.33	13	52.9	19	40.78	6	44.3
30.3	58.78	10	32.7	3	3.39	10	48.1	3	52.17	16	54.4	15	40.68	10	44.1
Feb. 9.3	58.65	13	32.4	3	3.26	13	47.9	2	51.97	20	55.4	10	40.55	13	43.9
19.3	58.50	15	32.1	3	3.11	15	47.6	3	51.75	22	55.9	5	40.40	15	43.7
Mar. 1.2	58.34	16	31.7	4	2.95	16	47.3	3	51.53	22	56.1	2	40.24	16	43.4
11.2	58.17	17	31.4	3	2.79	16	46.9	4	51.30	23	55.8	3	40.07	17	43.0
21.2	58.02	15	31.1	3	2.63	16	46.6	3	51.08	22	55.0	8	39.91	16	42.7
31.2	57.89	13	30.9	2	2.49	14	46.3	3	50.88	20	53.8	12	39.77	14	42.4
Apr. 10.1	57.78	11	30.7	2	2.38	11	46.1	2	50.71	17	52.2	16	39.65	12	42.1
20.1	57.71	7	30.6	1	2.31	7	45.9	2	50.57	14	50.3	19	39.58	7	41.9
30.1	57.68	3	30.7	1	2.28	3	45.8	1	50.48	9	48.0	23	39.54	4	41.7
May 10.0	57.69	1	30.8	1	2.29	1	45.9	1	50.44	4	45.5	25	39.55	1	41.7
20.0	57.76	7	31.1	3	2.35	6	46.1	2	50.44	0	42.7	28	39.61	6	41.7
30.0	57.87	11	31.6	5	2.46	11	46.4	3	50.50	6	39.8	29	39.71	10	41.9
June 9.0	58.02	15	32.2	6	2.61	15	46.9	5	50.60	10	36.8	30	39.86	15	42.3
18.9	58.22	20	32.9	7	2.81	20	47.5	6	50.76	16	33.8	30	40.05	19	42.8
28.9	58.45	23	33.8	9	3.04	23	48.2	7	50.96	20	30.8	30	40.28	23	43.4
July 8.9	58.71	26	34.8	10	3.30	26	49.1	9	51.19	23	28.0	28	40.54	26	44.2
18.9	58.99	28	35.8	10	3.59	29	50.0	9	51.46	27	25.4	26	40.82	28	45.0
28.8	59.29	30	36.8	10	3.89	30	51.0	10	51.75	29	23.1	23	41.13	31	45.9
Aug. 7.8	59.60	31	37.9	11	4.20	31	52.0	10	52.06	31	21.2	19	41.44	31	46.8
17.8	59.92	32	38.9	10	4.52	32	53.0	10	52.39	33	19.7	15	41.76	32	47.7
27.7	60.24	32	39.9	10	4.84	32	53.9	9	52.72	33	18.7	10	42.09	33	48.6
Sept. 6.7	60.55	31	40.7	8	5.16	32	54.8	9	53.05	33	18.2	5	42.41	32	49.4
16.7	60.86	31	41.4	7	5.47	31	55.5	7	53.36	31	18.2	0	42.72	31	50.1
26.7	61.15	29	42.0	6	5.76	29	56.1	6	53.67	31	18.8	6	43.02	30	50.7
Oct. 6.6	61.42	27	42.4	4	6.04	28	56.6	5	53.95	28	20.0	12	43.31	29	51.2
16.6	61.68	26	42.7	3	6.30	26	56.9	3	54.21	26	21.6	16	43.58	27	51.6
26.6	61.91	23	42.8	1	6.54	24	57.1	2	54.44	23	23.7	21	43.83	25	51.8
Nov. 5.6	62.12	21	42.8	0	6.76	22	57.1	0	54.64	20	26.1	24	44.05	22	52.0
15.5	62.30	18	42.7	1	6.94	18	57.1	0	54.80	16	28.7	26	44.24	19	52.0
25.5	62.45	15	42.5	2	7.10	16	57.1	0	54.91	11	31.5	28	44.40	16	52.0
Dec. 5.5	62.57	12	42.3	2	7.22	12	56.9	2	54.99	8	34.4	29	44.53	13	52.0
15.4	62.65	8	42.0	3	7.30	8	56.7	2	55.01	2	37.2	28	44.62	9	51.9
25.4	62.68	3	41.7	3	7.35	5	56.5	2	55.00	1	39.9	27	44.67	5	51.8
35.4	62.68	0	41.3	4	7.35	0	56.3	2	54.93	7	42.3	24	44.67	0	51.6
Sec δ, Tan δ	1.037		+0.276		1.048		+0.312		1.209		−0.680		1.058		+0.34
Mean Place	57ˢ.254		23″.64		1ˢ.841		38″.52		50ˢ.633		49″.46		39ˢ.084		34″.14
D′ψ a, Dω a	+0.01		−0.01		+0.01		−0.01		−0.02		+0.02		+0.01		−0.01
Dψ δ, Dω δ	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.2		+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**δ Mensæ.** Mag. 5.6				**m Persei.** Mag. 6.1				**α Tauri.** (*Aldebaran.*) Mag. 1.1				**ν Eridani.** Mag. 4.1			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	4 23		−80 24		4 27		+42 53		4 31		+16 20		4 32		− 3 31	
	s		″		s		″		s		″		s		″	
an. 0.4	48.57		53.3		27.98		14.8		4.26		31.3		5.96		25.3	
		101		24		3		11		1		2		2		12
10.4	47.56		55.7		27.95		15.9		4.25		31.1		5.94		26.5	
		118		20		9		9		6		3		6		11
20.4	46.38		57.7		27.86		16.8		4.19		30.8		5.88		27.6	
		132		14		13		7		9		2		10		9
30.3	45.06		59.1		27.73		17.5		4.10		30.6		5.78		28.5	
		142		8		17		4		12		3		12		7
eb. 9.3	43.64		59.9		27.56		17.9		3.98		30.3		5.66		29.2	
		148		3		21		1		15		3		15		5
19.3	42.16		60.2		27.35		18.0		3.83		30.0		5.51		29.7	
		149		2		22		2		16		3		16		3
ar. 1.2	40.67		60.0		27.13		17.8		3.67		29.7		5.35		30.0	
		148		8		22		4		17		3		17		1
11.2	39.19		59.2		26.91		17.4		3.50		29.4		5.18		30.1	
		143		14		21		7		16		3		16		1
21.2	37.76		57.8		26.70		16.7		3.34		29.1		5.02		30.0	
		134		18		20		10		14		2		15		3
31.2	36.42		56.0		26.50		15.7		3.20		28.9		4.87		29.7	
		121		22		15		11		12		2		12		5
pr. 10.1	35.21		53.8		26.35		14.6		3.08		28.7		4.75		29.2	
		107		26		11		12		8		1		9		7
20.1	34.14		51.2		26.24		13.4		3.00		28.6		4.66		28.5	
		90		29		6		13		4		1		5		10
30.1	33.24		48.3		26.18		12.1		2.96		28.5		4.61		27.5	
		70		32		0		13		0		1		1		11
ay 10.1	32.54		45.1		26.18		10.8		2.96		28.6		4.60		26.4	
		49		34		7		13		5		2		3		13
20.0	32.05		41.7		26.25		9.5		3.01		28.8		4.63		25.1	
		28		34		12		12		9		4		8		15
30.0	31.77		38.3		26.37		8.3		3.10		29.2		4.71		23.6	
		5		35		18		11		14		5		12		16
une 9.0	31.72		34.8		26.55		7.2		3.24		29.7		4.83		22.0	
		18		34		23		8		18		6		16		17
18.9	31.90		31.4		26.78		6.4		3.42		30.3		4.99		20.3	
		39		32		28		7		22		7		20		18
28.9	32.29		28.2		27.06		5.7		3.64		31.0		5.19		18.5	
		60		30		32		4		25		8		23		18
uly 8.9	32.89		25.2		27.38		5.3		3.89		31.8		5.42		16.7	
		78		27		35		3		27		10		25		17
18.9	33.67		22.5		27.73		5.0		4.16		32.8		5.67		15.0	
		95		23		38		0		30		9		27		16
28.8	34.62		20.2		28.11		5.0		4.46		33.7		5.94		13.4	
		108		18		39		2		31		10		29		15
ug. 7.8	35.70		18.4		28.50		5.2		4.77		34.7		6.23		11.9	
		119		13		41		4		31		9		30		13
17.8	36.89		17.1		28.91		5.6		5.08		35.6		6.53		10.6	
		125		7		41		6		32		8		30		10
27.8	38.14		16.4		29.32		6.2		5.40		36.4		6.83		9.6	
		128		0		40		8		32		8		29		7
ept. 6.7	39.42		16.4		29.72		7.0		5.72		37.2		7.12		8.9	
		125		6		40		9		31		6		29		4
16.7	40.67		17.0		30.12		7.9		6.03		37.8		7.41		8.5	
		119		11		39		10		30		5		29		0
26.7	41.86		18.1		30.51		8.9		6.33		38.3		7.70		8.5	
		109		18		36		11		28		3		26		2
ct. 6.6	42.95		19.9		30.87		10.0		6.61		38.6		7.96		8.7	
		94		23		35		12		27		3		25		6
16.6	43.89		22.2		31.22		11.2		6.88		38.9		8.21		9.3	
		76		27		31		13		25		0		23		8
26.6	44.65		24.9		31.53		12.5		7.13		38.9		8.44		10.1	
		55		31		29		14		22		0		21		11
Nov. 5.6	45.20		28.0		31.82		13.9		7.35		38.9		8.65		11.2	
		31		33		25		14		20		1		18		12
15.5	45.51		31.3		32.07		15.3		7.55		38.8		8.83		12.4	
		7		34		21		14		17		2		15		14
25.5	45.58		34.7		32.28		16.7		7.72		38.6		8.98		13.8	
		19		34		16		14		13		3		11		14
Dec. 5.5	45.39		38.1		32.44		18.1		7.85		38.3		9.09		15.2	
		44		33		11		14		10		3		8		15
15.5	44.95		41.4		32.55		19.5		7.95		38.0		9.17		16.7	
		67		30		6		13		5		2		4		14
25.4	44.28		44.4		32.61		20.8		8.00		37.8		9.21		18.1	
		89		27		0		12		1		3		0		13
35.4	43.39		47.1		32.61		22.0		8.01		37.5		9.21		19.4	
ec δ, Tan δ	6.003		−5.919		1.365		+0.929		1.042		+0.293		1.002		−0.062	
ean Place	41ˢ.271		50″.32		25ˢ.825		0″.24		2ˢ.478		21″.52		4ˢ.240		31″.42	
ψα, D$_\omega$α	−0.14		+0.16		+0.02		−0.02		+0.01		−0.01		0.00		0.00	
ψδ, D$_\omega$δ	+0.2		+0.9		+0.2		+0.9		+0.2		+0.9		+0.1		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**α Doradus.** Mag. 3.5				**53 Eridani.** Mag. 4.0				**τ Tauri.** Mag. 4.3				**Groombridge 84** Mag. 6.0		
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Decli tion
	h m 4 32		° ′ −55 12		h m 4 34		° ′ −14 27		h m 4 37		° ′ +22 47		h m 4 37		° +75
	s		″		s		″		s		″		s		″
Jan. 0.4	12.07		75.1		18.91		65.5		10.35		52.0		27.91		35.9
10.4	11.88	19	77.7	26	18.88	3	67.2	17	10.35	0	52.1	1	27.67	24	38.5
20.4	11.63	25	79.9	22	18.80	8	68.7	15	10.30	5	52.1	0	27.28	39	40.7
30.3	11.33	30	81.6	17	18.70	10	69.9	12	10.21	9	52.1	0	26.74	54	42.5
Feb. 9.3	11.00	33	82.8	12	18.56	14	70.8	9	10.08	13	52.0	1	26.10	64	43.9
19.3	10.64	36	83.5	7	18.39	17	71.4	6	9.93	15	51.9	1	25.37	73	44.7
Mar. 1.3	10.26	38	83.6	1	18.22	17	71.8	4	9.76	17	51.6	3	24.60	77	45.0
11.2	9.88	38	83.2	4	18.04	18	71.8	0	9.59	17	51.3	3	23.82	78	44.6
21.2	9.51	37	82.2	10	17.87	17	71.5	3	9.42	17	51.0	3	23.07	75	43.8
31.2	9.17	34	80.7	15	17.71	16	70.9	6	9.27	15	50.6	4	22.39	68	42.4
Apr. 10.1	8.87	30	78.8	19	17.57	14	70.0	9	9.14	13	50.2	4	21.80	59	40.6
20.1	8.61	26	76.5	23	17.47	10	68.9	11	9.05	9	49.8	4	21.34	46	38.4
30.1	8.40	21	73.8	27	17.40	7	67.5	14	9.00	5	49.4	4	21.02	32	36.0
May 10.1	8.26	14	70.8	30	17.38	2	65.8	17	9.00	0	49.1	3	20.86	16	33.4
20.0	8.18	8	67.6	32	17.40	2	63.9	19	9.05	5	49.0	1	20.86	0	30.7
30.0	8.18	0	64.2	34	17.47	7	61.9	20	9.14	9	48.9	1	21.04	18	28.0
June 9.0	8.24	6	60.8	34	17.58	11	59.8	21	9.28	14	49.0	1	21.38	34	25.3
19.0	8.37	13	57.4	34	17.73	15	57.5	23	9.46	18	49.3	3	21.87	49	22.9
28.9	8.57	20	54.0	34	17.91	18	55.3	22	9.69	23	49.6	3	22.50	63	20.7
July 8.9	8.83	26	50.8	32	18.13	22	53.1	22	9.94	25	50.1	5	23.26	76	18.7
18.9	9.13	30	48.0	28	18.38	25	51.0	21	10.22	28	50.7	6	24.12	86	17.1
28.8	9.48	35	45.4	26	18.65	27	49.0	20	10.53	31	51.4	7	25.08	96	15.9
Aug. 7.8	9.87	39	43.3	21	18.94	29	47.3	17	10.85	32	52.1	7	26.10	102	15.0
17.8	10.28	41	41.8	15	19.24	30	45.9	14	11.18	33	52.8	7	27.16	106	14.6
27.8	10.71	43	40.8	10	19.54	30	44.9	10	11.51	33	53.6	8	28.26	110	14.6
Sept. 6.7	11.14	43	40.4	4	19.83	29	44.2	7	11.84	33	54.3	7	29.37	111	15.0
16.7	11.56	42	40.6	2	20.13	30	43.9	3	12.16	32	54.9	6	30.46	109	15.8
26.7	11.97	41	41.5	9	20.41	28	44.1	2	12.47	31	55.5	6	31.52	106	17.0
Oct. 6.6	12.35	38	42.9	14	20.68	27	44.6	5	12.77	30	56.0	5	32.54	102	18.6
16.6	12.69	34	45.0	21	20.93	25	45.6	10	13.06	29	56.4	4	33.49	95	20.6
26.6	12.99	30	47.5	25	21.16	23	46.9	13	13.32	26	56.8	4	34.36	87	22.8
Nov. 5.6	13.23	24	50.4	29	21.36	20	48.5	16	13.56	24	57.1	3	35.13	77	25.3
15.5	13.42	19	53.6	32	21.54	18	50.3	18	13.78	22	57.3	2	35.78	65	28.1
25.5	13.54	12	57.0	34	21.68	14	52.3	20	13.96	18	57.5	2	36.29	51	31.0
Dec. 5.5	13.59	5	60.4	34	21.79	11	54.3	20	14.10	14	57.6	1	36.65	36	34.0
15.5	13.57	2	63.7	33	21.86	7	56.4	21	14.21	11	57.7	1	36.85	20	37.0
25.4	13.49	8	66.9	32	21.89	3	58.4	20	14.27	6	57.8	1	36.88	3	39.9
35.4	13.34	15	69.8	29	21.88	1	60.2	18	14.29	2	57.9	1	36.74	14	42.6
Sec δ, Tan δ	1.753		−1.440		1.033		−0.258		1.085		+0.420		4.074		+3.93
Mean Place	9s.519		73″.84		17s.155		69″.75		8s.495		41″.21		22s.320		18″.33
D′ψ α, Dω α	−0.03		+0.03		−0.01		+0.01		+0.01		−0.01		+0.10		−0.00
Dψ δ, Dω δ	+0.1		+0.9		+0.1		+0.9		+0.1		+0.9		+0.1		+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	α Coeli. Mag. 4.5				4 Camelop. Mag. 5.4				μ Eridani. Mag. 4.2				π³ Orionis. Mag. 3.3			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	4 37		−42 1		4 40		+56 36		4 41		− 3 24		4 45		+ 6 48	
	s		″		s		″		s		″		s		″	
an. 0.4	51.37	10	32.7	26	57.86	5	42.6	18	16.84	1	28.4	12	15.25	0	57.7	7
10.4	51.27	15	35.3	21	57.81	12	44.4	16	16.83	6	29.6	11	15.25	5	57.0	7
20.4	51.12	20	37.4	17	57.69	19	46.0	13	16.77	9	30.7	10	15.20	8	56.3	6
30.3	50.92	22	39.1	13	57.50	24	47.3	9	16.68	12	31.7	7	15.12	11	55.7	5
eb. 9.3	50.70	26	40.4	8	57.26	28	48.2	5	16.56	15	32.4	6	15.01	14	55.2	4
19.3	50.44	27	41.2	2	56.98	31	48.7	1	16.41	16	33.0	3	14.87	16	54.8	3
ar. 1.3	50.17	27	41.4	2	56.67	32	48.8	4	16.25	17	33.3	1	14.71	16	54.5	2
11.2	49.90	26	41.2	7	56.35	31	48.4	7	16.08	16	33.4	0	14.55	16	54.3	1
21.2	49.64	25	40.5	12	56.04	27	47.7	11	15.92	15	33.4	3	14.39	15	54.2	0
31.2	49.39	22	39.3	16	55.77	24	46.6	14	15.77	13	33.1	5	14.24	13	54.2	1
pr. 10.1	49.17	18	37.7	20	55.53	18	45.2	16	15.64	9	32.6	7	14.11	9	54.3	3
20.1	48.99	13	35.7	23	55.35	11	43.6	18	15.55	6	31.9	9	14.02	6	54.6	4
30.1	48.86	9	33.4	27	55.24	4	41.8	20	15.49	2	31.0	11	13.96	1	55.0	6
ay 10.1	48.77	3	30.7	29	55.20	4	39.8	20	15.47	2	29.9	13	13.95	3	55.6	7
20.0	48.74	2	27.8	31	55.24	12	37.8	19	15.49	7	28.6	14	13.98	8	56.3	9
30.0	48.76	8	24.7	31	55.36	20	35.9	18	15.56	12	27.2	16	14.06	12	57.2	10
une 9.0	48.84	13	21.6	32	55.56	26	34.1	16	15.68	15	25.6	17	14.18	16	58.2	11
19.0	48.97	18	18.4	32	55.82	33	32.5	15	15.83	19	23.9	17	14.34	19	59.3	12
28.9	49.15	22	15.2	30	56.15	39	31.0	12	16.02	22	22.2	18	14.53	23	60.5	13
uly 8.9	49.37	27	12.2	28	56.54	43	29.8	10	16.24	25	20.4	17	14.76	26	61.8	12
18.9	49.64	29	9.4	25	56.97	47	28.8	6	16.49	27	18.7	16	15.02	27	63.0	13
28.8	49.93	32	6.9	20	57.44	50	28.2	4	16.76	28	17.1	14	15.29	29	64.3	11
Aug. 7.8	50.25	34	4.9	16	57.94	51	27.8	1	17.04	29	15.7	12	15.58	30	65.4	11
17.8	50.59	36	3.3	11	58.45	52	27.7	3	17.33	30	14.5	10	15.88	30	66.5	8
27.8	50.95	35	2.2	6	58.97	53	28.0	5	17.63	30	13.5	7	16.18	31	67.3	7
Sept. 6.7	51.30	34	1.6	0	59.50	52	28.5	7	17.93	29	12.8	4	16.49	30	68.0	5
16.7	51.64	34	1.6	7	60.02	51.	29.2	10	18.22	29	12.4	1	16.79	29	68.5	3
26.7	51.98	31	2.3	12	60.53	48	30.2	13	18.51	27	12.3	2	17.08	28	68.8	0
Oct. 6.7	52.29	29	3.5	17	61.01	46	31.5	15	18.78	25	12.5	6	17.36	27	68.8	2
16.6	52.58	26	5.2	22	61.47	43	33.0	16	19.03	24	13.1	8	17.63	24	68.6	4
26.6	52.84	22	7.4	26	61.90	38	34.6	19	19.27	21	13.9	11	17.87	23	68.2	6
Nov. 5.6	53.06	18	10.0	29	62.28	34	36.5	20	19.48	19	15.0	13	18.10	20	67.6	7
15.5	53.24	14	12.9	31	62.62	28	38.5	20	19.67	16	16.3	14	18.30	17	66.9	9
25.5	53.38	8	16.0	32	62.90	22	40.5	22	19.83	12	17.7	15	18.47	14	66.0	9
Dec. 5.5	53.46	3	19.2	31	63.12	14	42.7	21	19.95	9	19.2	14	18.61	10	65.1	8
15.5	53.49	2	22.3	30	63.26	8	44.8	20	20.04	5	20.6	15	18.71	6	64.3	9
25.4	53.47	8	25.3	27	63.34	1	46.8	19	20.09	1	22.1	13	18.77	2	63.4	8
35.4	53.39		28.0		63.33		48.7		20.10		23.4		18.79		62.6	
ec δ, Tan δ	1.346		−0.901		1.817		+1.517		1.002		−0.060		1.007		+0.120	
ean Place	$49^{s}.265$		$33''.14$		$55^{s}.036$		$27''.09$		$15^{s}.094$		$34''.58$		$13^{s}.471$		$49''.86$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.02		+0.02		+0.04		−0.03		0.00		0.00		0.00		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		+0.9		+0.1		+0.9		+0.1		+0.9		+0.1		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	9 Camelop. Mag. 4.4				ι Tauri. Mag. 5.1				π⁴ Orionis. Mag. 3.9				ι Aurigæ. Mag. 2.9		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declina tion N.
	h m 4 45 s		° ′ +66 11 ″		h m 4 46 s		° ′ +18 41 ″		h m 4 49 s		° ′ + 2 18 ″		h m 4 51 s		° +33 ″
Jan. 0.4	39.25		75.7		25.85		55.9		51.16		15.8		29.42		69.0
10.4	39.16	9	77.9	22	25.85	0	55.7	2	51.16	0	14.8	10	29.42	0	69.6
20.4	38.98	18	79.9	20	25.81	4	55.6	1	51.11	5	13.9	9	29.37	5	70.1
30.3	38.70	28	81.5	16	25.73	8	55.4	2	51.03	8	13.2	7	29.28	9	70.5
Feb. 9.3	38.35	35	82.7	12	25.61	12	55.2	2	50.91	12	12.5	7	29.15	13	70.8
19.3	37.94	41	83.5	8	25.46	15	55.0	2	50.77	14	12.1	4	28.98	17	70.9
Mar. 1.3	37.50	44	83.7	2	25.30	16	54.8	2	50.61	16	11.7	4	28.80	18	70.9
11.2	37.05	45	83.5	2	25.13	17	54.6	2	50.45	16	11.5	2	28.61	19	70.6
21.2	36.61	44	82.8	7	24.97	16	54.3	3	50.28	17	11.5	0	28.42	19	70.2
31.2	36.21	40	81.6	12	24.81	16	54.0	3	50.13	15	11.6	1	28.24	18	69.6
Apr. 10.2	35.86	35	80.0	16	24.69	12	53.8	2	50.01	12	11.9	3	28.09	15	69.0
20.1	35.59	27	78.1	19	24.59	10	53.6	2	49.91	10	12.3	4	27.98	11	68.2
30.1	35.41	18	76.0	21	24.54	5	53.4	2	49.85	6	13.0	7	27.91	7	67.4
May 10.1	35.32	9	73.8	22	24.52	2	53.4	0	49.82	3	13.8	8	27.89	2	66.6
20.0	35.34	2	71.4	24	24.56	4	53.4	0	49.85	3	14.7	9	27.93	4	65.9
30.0	35.46	12	69.1	23	24.64	8	53.6	2	49.91	6	15.8	11	28.01	8	65.2
June 9.0	35.68	22	66.8	23	24.77	13	53.9	3	50.02	11	17.1	13	28.15	14	64.6
19.0	36.00	32	64.7	21	24.94	17	54.3	4	50.17	15	18.4	13	28.34	19	64.2
28.9	36.41	41	62.7	20	25.15	21	54.9	6	50.36	19	19.9	15	28.56	22	63.9
July 8.9	36.90	49	61.1	16	25.39	24	55.5	6	50.58	22	21.3	14	28.83	27	63.8
18.9	37.45	55	59.7	14	25.66	27	56.2	7	50.83	25	22.7	14	29.13	30	63.8
28.8	38.06	61	58.6	11	25.95	29	57.0	8	51.10	27	24.1	14	29.45	32	63.9
Aug. 7.8	38.70	64	57.9	7	26.25	30	57.8	8	51.38	28	25.4	13	29.79	34	64.2
17.8	39.38	68	57.6	3	26.57	32	58.6	8	51.67	29	26.5	11	30.14	35	64.6
27.8	40.07	69	57.6	0	26.89	32	59.3	7	51.97	30	27.4	9	30.50	36	65.0
Sept. 6.7	40.76	69	57.9	3	27.21	32	59.9	6	52.27	30	28.1	7	30.86	36	65.6
16.7	41.46	70	58.6	7	27.53	32	60.5	6	52.57	30	28.6	5	31.22	36	66.2
26.7	42.13	67	59.7	11	27.84	31	60.9	4	52.85	28	28.7	1	31.57	35	66.8
Oct. 6.7	42.78	65	61.1	14	28.14	30	61.3	4	53.13	28	28.6	1	31.91	34	67.5
16.6	43.40	62	62.7	16	28.42	28	61.5	2	53.40	27	28.2	4	32.23	32	68.1
26.6	43.97	57	64.6	19	28.68	26	61.6	1	53.64	24	27.6	6	32.53	30	68.8
Nov. 5.6	44.48	51	66.8	22	28.92	24	61.6	0	53.87	23	26.8	8	32.81	28	69.5
15.5	44.92	44	69.1	23	29.14	22	61.5	1	54.07	20	25.8	10	33.06	25	70.2
25.5	45.29	37	71.6	25	29.32	18	61.4	1	54.24	17	24.7	11	33.27	21	70.9
Dec. 5.5	45.56	27	74.2	26	29.47	15	61.3	1	54.38	14	23.5	12	33.45	18	71.6
15.5	45.74	18	76.8	26	29.59	12	61.1	2	54.48	10	22.3	12	33.58	13	72.4
25.4	45.82	8	79.3	25	29.66	7	60.9	2	54.54	6	21.2	11	33.66	8	73.1
35.4	45.79	3	81.6	23	29.69	3	60.8	1	54.56	2	20.1	11	33.69	3	73.7
Sec δ, Tan δ	2.478		+2.268		1.056		+0.338		1.001		+0.040		1.193		+0.650
Mean Place	$35^{s}.540$		$59''.49$		$23^{s}.995$		$46''.04$		$49^{s}.380$		$8''.72$		$27^{s}.348$		$57''.14$
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.06		−0.05		+0.01		−0.01		0.00		0.00		+0.02		−0.01
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		+0.9		+0.1		+0.9		+0.1		+1.0		+0.1		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	*β* Camelop. Mag. 4.2				*ε* Aurigæ. Var. 3.0–4.5				*ζ* Aurigæ. Mag. 3.9				*ι* Tauri. Mag. 4.7			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	4 55		+60 19		4 55		+43 41		4 56		+40 57		4 58		+21 28	
	s		″		s		″		s		″		s		″	
an. 0.4	54.24		24.9		54.37		68.1		34.30		23.1		2.76		19.7	
10.4	54.20	4	26.9	20	54.37	0	69.3	12	34.30	0	24.2	11	2.78	2	19.7	0
20.4	54.08	12	28.7	18	54.31	6	70.4	11	34.25	5	25.2	10	2.74	4	19.7	0
30.3	53.89	19	30.2	15	54.20	11	71.2	8	34.15	10	25.9	7	2.66	8	19.6	1
eb. 9.3	53.63	26	31.4	12	54.04	16	71.9	7	34.00	15	26.5	6	2.55	11	19.6	0
19.3	53.32	31	32.1	7	53.85	19	72.2	3	33.81	19	26.8	3	2.41	14	19.5	1
ar. 1.3	52.97	35	32.4	3	53.63	22	72.3	1	33.60	21	26.9	1	2.24	17	19.3	2
11.2	52.61	36	32.3	1	53.40	23	72.2	1	33.39	21	26.7	2	2.07	17	19.1	2
21.2	52.26	35	31.7	6	53.17	23	71.7	5	33.17	22	26.2	5	1.90	17	18.8	3
31.2	51.93	33	30.7	10	52.96	21	70.9	8	32.97	20	25.5	7	1.74	16	18.5	3
pr. 10.2	51.65	28	29.4	13	52.78	18	70.0	9	32.80	17	24.6	9	1.60	14	18.2	3
20.1	51.42	23	27.7	17	52.64	14	68.9	11	32.67	13	23.6	10	1.50	10	17.9	3
30.1	51.27	15	25.9	18	52.55	9	67.6	13	32.58	9	22.5	11	1.43	7	17.7	2
ay 10.1	51.20	7	23.9	20	52.52	3	66.3	13	32.55	3	21.3	12	1.41	2	17.5	2
20.0	51.21	1	21.8	21	52.55	3	65.0	13	32.58	3	20.2	11	1.44	3	17.4	1
30.0	51.30	9	19.7	21	52.64	9	63.7	13	32.67	9	19.1	11	1.51	7	17.3	1
une 9.0	51.48	18	17.6	21	52.78	14	62.5	12	32.81	14	18.0	11	1.63	12	17.4	1
19.0	51.74	26	15.7	19	52.98	20	61.5	10	33.00	19	17.1	9	1.79	16	17.7	3
28.9	52.07	33	14.0	17	53.23	25	60.6	9	33.24	24	16.4	7	1.99	20	18.0	3
uly 8.9	52.47	40	12.5	15	53.53	30	59.9	7	33.53	29	15.8	6	2.23	24	18.4	4
18.9	52.92	45	11.2	13	53.86	33	59.3	6	33.85	32	15.4	4	2.50	27	18.9	5
28.9	53.42	50	10.2	10	54.23	37	59.0	3	34.20	35	15.1	3	2.79	29	19.5	6
Aug. 7.8	53.95	53	9.6	6	54.61	38	58.9	1	34.57	37	15.1	0	3.09	30	20.2	7
17.8	54.51	56	9.2	4	55.01	40	58.9	0	34.95	38	15.2	1	3.41	32	20.8	6
27.8	55.08	57	9.2	0	55.42	41	59.2	3	35.35	40	15.5	3	3.74	33	21.4	6
Sept. 6.7	55.66	58	9.4	2	55.83	41	59.6	4	35.74	39	15.9	4	4.06	32	21.9	5
16.7	56.24	58	10.0	6	56.24	41	60.2	6	36.14	40	16.5	6	4.39	33	22.4	5
26.7	56.81	57	10.8	8	56.64	40	60.9	7	36.52	38	17.1	6	4.70	31	22.8	4
Oct. 6.7	57.36	55	11.9	11	57.03	39	61.7	8	36.90	38	17.9	8	5.01	31	23.2	4
16.6	57.88	52	13.3	14	57.40	37	62.6	9	37.26	36	18.8	9	5.30	29	23.4	2
26.6	58.36	48	14.9	16	57.75	35	63.7	11	37.59	33	19.7	9	5.58	28	23.5	1
Nov. 5.6	58.81	45	16.8	19	58.07	32	64.8	11	37.90	31	20.7	10	5.84	26	23.6	1
15.6	59.20	39	18.8	20	58.36	29	66.1	13	38.18	28	21.8	11	6.07	23	23.6	0
25.5	59.53	33	20.9	21	58.61	25	67.4	13	38.42	24	23.0	12	6.27	20	23.6	0
Dec. 5.5	59.79	26	23.2	23	58.81	20	68.7	13	38.62	20	24.2	12	6.43	16	23.6	0
15.5	59.97	18	25.4	22	58.96	15	70.1	14	38.76	14	25.3	11	6.56	13	23.6	0
25.4	60.07	10	27.6	22	59.05	9	71.4	13	38.86	10	26.5	12	6.64	8	23.6	0
35.4	60.09	2	29.8	22	59.09	4	72.6	12	38.89	3	27.6	11	6.68	4	23.5	1
Sec *δ*, Tan *δ*	2.020		+1.755		1.383		+0.956		1.324		+0.868		1.075		+0.393	
Mean Place	51ˢ.023		10″.05		52ˢ.017		55″.08		32ˢ.023		10″.53		0ˢ.837		9″.83	
$D'_\psi a$, $D_\omega a$	+0.05		−0.03		+0.02		−0.02		+0.02		−0.02		+0.01		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

Mean Solar Date.	11 Orionis. Mag. 4.6				η Aurigæ. Mag. 3.3				ε Leporis. Mag. 3.3				β Eridani. Mag. 2.9		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.
	h m 4 59		° ′ +15 17		h m 5 0		° ′ +41 7		h m 5 1		° ′ −22 28		h m 5 3		° − 51
	s		″		s		″		s		″		s		″
Jan. 0.4	44.52		20.9		35.42		26.6		53.59		60.5		42.05		37.7
10.4	44.53	1	20.5	4	35.43	1	27.7	11	53.57	2	62.7	22	42.05	0	39.1
20.4	44.50	3	20.2	3	35.38	5	28.6	9	53.50	7	64.6	19	42.01	4	40.4
30.4	44.43	7	19.9	3	35.28	10	29.4	8	53.39	11	66.2	16	41.93	8	41.5
Feb. 9.3	44.32	11	19.7	2	35.13	15	30.0	6	53.25	14	67.4	12	41.82	11	42.3
19.3	44.18	14	19.4	3	34.95	18	30.4	4	53.08	17	68.3	9	41.67	15	43.0
Mar. 1.3	44.02	16	19.2	2	34.74	21	30.5	1	52.89	19	68.8	5	41.51	16	43.4
11.2	43.85	17	19.0	2	34.52	22	30.3	2	52.69	20	69.0	2	41.34	17	43.6
21.2	43.69	16	18.8	2	34.30	22	29.9	4	52.50	19	68.8	2	41.17	17	43.6
31.2	43.53	16	18.6	2	34.10	20	29.2	7	52.31	19	68.2	6	41.01	16	43.3
Apr. 10.2	43.40	13	18.5	1	33.93	17	28.4	8	52.14	17	67.3	9	40.87	14	42.8
20.1	43.30	10	18.5	0	33.79	14	27.4	10	52.01	13	66.0	13	40.76	11	42.1
30.1	43.23	7	18.5	0	33.70	9	26.3	11	51.91	10	64.4	16	40.68	8	41.2
May 10.1	43.21	2	18.6	1	33.67	3	25.1	12	51.85	6	62.5	19	40.64	4	40.1
20.1	43.23	2	18.8	2	33.69	2	23.9	12	51.83	2	60.4	21	40.65	1	38.8
30.0	43.30	7	19.2	4	33.77	8	22.8	11	51.86	3	58.1	23	40.70	5	37.3
June 9.0	43.41	11	19.6	4	33.91	14	21.7	11	51.94	8	55.7	24	40.79	9	35.7
19.0	43.56	15	20.2	6	34.10	19	20.8	9	52.06	12	53.2	25	40.92	13	34.0
28.9	43.75	19	20.9	7	34.34	24	20.0	8	52.22	16	50.7	25	41.09	17	32.3
July 8.9	43.98	23	21.6	7	34.62	28	19.4	6	52.41	19	48.2	25	41.29	20	30.5
18.9	44.23	25	22.5	9	34.94	32	18.9	5	52.64	23	45.8	24	41.52	23	28.8
28.9	44.51	28	23.3	8	35.29	35	18.6	3	52.89	25	43.6	22	41.77	25	27.2
Aug. 7.8	44.80	29	24.1	8	35.66	37	18.5	1	53.17	28	41.7	19	42.04	27	25.7
17.8	45.11	31	24.9	8	36.04	38	18.6	1	53.46	29	40.2	15	42.33	29	24.5
27.8	45.42	31	25.6	7	36.43	39	18.9	3	53.76	30	39.0	12	42.62	29	23.5
Sept. 6.7	45.73	31	26.2	6	36.83	40	19.2	3	54.07	31	38.2	8	42.92	30	22.8
16.7	46.05	32	26.6	4	37.22	39	19.7	5	54.37	30	37.9	3	43.21	29	22.4
26.7	46.35	30	27.0	4	37.61	39	20.3	6	54.67	30	38.2	3	43.50	29	22.4
Oct. 6.7	46.65	30	27.1	1	37.99	38	21.0	7	54.95	28	38.9	7	43.78	28	22.7
16.6	46.93	28	27.1	0	38.35	36	21.9	9	55.22	27	40.0	11	44.05	27	23.4
26.6	47.20	27	27.0	1	38.69	34	22.8	9	55.48	26	41.6	16	44.30	25	24.3
Nov. 5.6	47.45	25	26.8	2	39.01	32	23.8	10	55.70	22	43.5	19	44.53	23	25.5
15.6	47.67	22	26.5	3	39.29	28	24.8	10	55.90	20	45.7	22	44.74	21	26.9
25.5	47.87	20	26.1	4	39.53	24	26.0	12	56.07	17	48.1	24	44.91	17	28.5
Dec. 5.5	48.03	16	25.6	5	39.74	21	27.1	11	56.20	13	50.6	25	45.06	15	30.2
15.5	48.15	12	25.2	4	39.89	15	28.3	12	56.29	9	53.1	25	45.17	11	31.8
25.4	48.23	8	24.8	4	39.99	10	29.5	12	56.34	5	55.6	25	45.23	6	33.4
35.4	48.27	4	24.4	4	40.03	4	30.6	11	56.34	0	57.9	23	45.26	3	34.9
Sec δ, Tan δ	1.037		+0.273		1.328		+0.873		1.082		−0.414		1.004		−0.09
Mean Place	42ˢ.650		11″.96		33ˢ.117		14″.19		51ˢ.735		64″.16		40ˢ.249		43″.6
D′ψ a, Dω a	+0.01		0.00		+0.02		−0.02		−0.01		+0.01		0.00		0.00
ψ δ, Dω δ	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**μ Aurigæ.** Mag. 4.8				**19 H. Camelop.** Mag. 5.2				**μ Leporis.** Mag. 3.3				**α Aurigæ.** (*Capella.*) Mag. 0.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 7		+38 23		5 8		+79 8		5 9		−16 17		5 10		+45 54	
	s		″		s		″		s		″		s		″	
an. 0.4	38.80		17.2		39.43		25.1		8.61		74.7		26.96		58.2	
10.4	38.82	2	18.2	10	39.24	19	28.0	29	8.60	1	76.7	20	26.98	2	59.6	14
20.4	38.78	4	19.0	8	38.82	42	30.6	26	8.55	5	78.4	17	26.93	5	60.8	12
30.4	38.69	9	19.7	7	38.21	61	32.8	22	8.46	9	79.8	14	26.82	11	61.8	10
eb. 9.3	38.56	13	20.3	6	37.43	78	34.5	17	8.33	13	81.0	12	26.67	15	62.6	8
19.3	38.39	17	20.6	3	36.52	91	35.8	13	8.17	16	81.9	9	26.47	20	63.1	5
ar. 1.3	38.19	20	20.7	1	35.52	100	36.5	7	8.00	17	82.4	5	26.25	22	63.4	3
11.2	37.98	21	20.6	1	34.48	104	36.6	1	7.82	18	82.6	2	26.01	24	63.3	1
21.2	37.77	21	20.2	4	33.45	103	36.2	4	7.63	19	82.5	1	25.77	24	62.9	4
31.2	37.57	20	19.7	5	32.48	97	35.2	10	7.45	18	82.1	4	25.54	23	62.3	6
Apr. 10.2	37.40	17	19.0	7	31.61	87	33.7	15	7.30	15	81.3	8	25.34	20	61.4	9
20.1	37.27	13	18.1	9	30.88	73	31.7	20	7.17	13	80.3	10	25.18	16	60.3	11
30.1	37.18	9	17.1	10	30.32	56	29.4	23	7.07	10	79.0	13	25.08	10	59.0	13
May 10.1	37.14	4	16.1	10	29.95	37	26.9	25	7.02	5	77.4	16	25.02	6	57.6	14
20.1	37.16	2	15.0	11	29.78	17	24.1	28	7.00	2	75.6	18	25.03	1	56.2	14
30.0	37.23	7	14.0	10	29.83	5	21.3	28	7.03	3	73.6	20	25.10	7	54.8	14
June 9.0	37.35	12	13.1	9	30.09	26	18.5	28	7.11	8	71.5	21	25.23	13	53.5	13
19.0	37.53	18	12.3	8	30.55	46	15.8	27	7.23	12	69.3	22	25.42	19	52.2	13
28.9	37.75	22	11.6	7	31.21	66	13.2	26	7.38	15	67.0	23	25.66	24	51.1	11
July 8.9	38.02	27	11.1	5	32.05	84	10.9	23	7.58	20	64.8	22	25.95	29	50.1	10
18.9	38.32	30	10.7	4	33.04	99	8.8	21	7.80	22	62.6	22	26.28	33	49.4	7
28.9	38.65	33	10.5	2	34.17	113	7.1	17	8.05	25	60.6	20	26.64	36	48.8	6
Aug. 7.8	39.00	35	10.5	0	35.41	124	5.7	14	8.32	27	58.8	18	27.03	39	48.4	4
17.8	39.37	37	10.6	1	36.73	132	4.8	9	8.60	28	57.3	15	27.44	41	48.2	2
27.8	39.75	38	10.8	2	38.11	138	4.2	6	8.89	29	56.2	11	27.86	42	48.2	0
Sept. 6.8	40.13	38	11.1	3	39.53	142	4.1	1	9.19	30	55.4	8	28.28	42	48.4	2
16.7	40.51	38	11.5	4	40.96	143	4.4	3	9.49	30	55.1	3	28.71	43	48.8	4
26.7	40.89	38	12.0	5	42.38	142	5.1	7	9.78	29	55.2	1	29.13	42	49.3	5
Oct. 6.7	41.26	37	12.6	6	43.76	138	6.3	12	10.07	29	55.8	6	29.54	41	50.0	7
16.6	41.61	35	13.2	6	45.07	131	7.8	15	10.34	27	56.8	10	29.94	40	50.8	8
26.6	41.94	33	14.0	8	46.29	122	9.7	19	10.59	25	58.1	13	30.31	37	51.8	10
Nov. 5.6	42.25	31	14.8	8	47.39	110	12.0	23	10.82	23	59.8	17	30.66	35	52.9	11
15.6	42.53	28	15.7	9	48.35	96	14.5	25	11.03	21	61.7	19	30.97	31	54.1	12
25.5	42.78	25	16.6	9	49.14	79	17.3	28	11.21	18	63.8	21	31.25	28	55.5	14
Dec. 5.5	42.98	20	17.5	9	49.74	60	20.3	30	11.35	14	66.1	23	31.47	22	56.9	14
15.5	43.14	16	18.5	10	50.12	38	23.3	30	11.45	10	68.3	22	31.65	18	58.3	14
25.5	43.24	10	19.5	10	50.29	17	26.3	30	11.51	6	70.5	22	31.76	11	59.7	14
35.4	43.30	6	20.5	10	50.23	6	29.3	30	11.53	2	72.6	21	31.81	5	61.1	14
Sec δ, Tan δ	1.276		+0.792		5.307		+5.212		1.042		−0.292		1.437		+1.032	
Mean Place	36ˢ.538		5″.59		31ˢ.512		10″.01		6ˢ.773		79″.23		24ˢ.448		45″.93	
$D'_\psi\alpha$, $D_\omega\alpha$	+0.02		−0.01		+0.13		−0.08		−0.01		0.00		+0.03		−0.01	
$D_\psi\delta$, $D_\omega\delta$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Orionis. (*Rigel.*) Mag. 0.3				λ Aurigæ. Mag. 4.8				τ Orionis. Mag. 3.7				o Columbæ. Mag. 4.9		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Dec tio
	h m 5 10		° ′ − 8 17		h m 5 13		° ′ +40 1		h m 5 13		° ′ − 6 55		h m 5 14		−3
	s		″		s		″		s		″		s		″
Jan. 0.4	28.94		51.0		11.92		40.3		30.55		61.9		26.99		37.
10.4	28.95	1	52.6	16	11.94	2	41.3	10	30.56	1	63.4	15	26.95	4	40.
20.4	28.91	4	54.0	14	11.91	3	42.3	10	30.52	4	64.8	14	26.86	9	42.
30.4	28.83	8	55.2	12	11.82	9	43.1	8	30.44	8	65.9	11	26.72	14	44
Feb. 9.3	28.71	12	56.1	9	11.69	13	43.7	6	30.33	11	66.9	10	26.55	17	46.
19.3	28.57	14	56.9	8	11.52	17	44.1	4	30.19	14	67.6	7	26.34	21	47.
Mar. 1.3	28.41	16	57.4	5	11.32	20	44.2	1	30.03	16	68.0	4	26.11	23	48.
11.2	28.24	17	57.6	2	11.11	21	44.1	1	29.86	17	68.3	3	25.87	24	48.
21.2	28.06	18	57.5	1	10.89	22	43.8	3	29.69	17	68.3	0	25.63	24	48.
31.2	27.90	16	57.2	3	10.69	20	43.3	5	29.52	17	68.0	3	25.40	23	47.
Apr. 10.2	27.75	15	56.7	5	10.51	18	42.5	8	29.37	15	67.5	5	25.19	21	46.
20.1	27.63	12	55.9	8	10.37	14	41.6	9	29.25	12	66.8	7	25.01	18	45.
30.1	27.54	9	54.9	10	10.27	10	40.5	11	29.17	8	65.9	9	24.87	14	43.
May 10.1	27.50	4	53.7	12	10.23	4	39.4	11	29.12	5	64.7	12	24.77	10	41.
20.1	27.49	1	52.2	15	10.24	1	38.3	11	29.11	1	63.4	13	24.72	5	38.
30.0	27.53	4	50.6	16	10.30	6	37.2	11	29.15	4	61.8	16	24.71	1	35.
June 9.0	27.61	8	48.9	17	10.42	12	36.2	10	29.23	8	60.2	16	24.76	5	33.
19.0	27.73	12	47.0	19	10.60	18	35.2	10	29.35	12	58.4	18	24.85	9	30.
28.9	27.89	16	45.2	18	10.83	23	34.4	8	29.51	16	56.6	18	24.99	14	27.
July 8.9	28.09	20	43.3	19	11.09	26	33.7	7	29.70	19	54.8	18	25.18	19	24.
18.9	28.31	22	41.4	19	11.39	30	33.2	5	29.93	23	53.0	18	25.40	22	21.
28.9	28.56	25	39.7	17	11.73	34	32.9	3	30.17	24	51.3	17	25.65	25	19.
Aug. 7.8	28.83	27	38.1	16	12.09	36	32.7	2	30.44	27	49.8	15	25.93	28	17.
17.8	29.11	28	36.8	13	12.46	37	32.6	1	30.72	28	48.5	13	26.23	30	15.
27.8	29.40	29	35.8	10	12.84	38	32.7	1	31.01	29	47.5	10	26.55	32	13.
Sept. 6.8	29.70	30	35.1	7	13.23	39	33.0	3	31.31	30	46.8	7	26.88	33	13.
16.7	29.99	29	34.7	4	13.63	40	33.3	3	31.60	29	46.5	3	27.20	32	12.
26.7	30.28	29	34.8	1	14.01	38	33.7	4	31.89	29	46.5	0	27.53	33	13.
Oct. 6.7	30.57	29	35.2	4	14.39	38	34.3	6	32.17	28	46.8	3	27.84	31	13.
16.6	30.84	27	35.9	7	14.76	37	34.9	6	32.45	28	47.5	7	28.14	30	15.
26.6	31.09	25	36.9	10	15.11	35	35.7	8	32.70	25	48.6	11	28.42	28	17.
Nov. 5.6	31.33	24	38.3	14	15.43	32	36.5	8	32.94	24	49.9	13	28.67	25	19.
15.6	31.54	21	39.9	16	15.72	29	37.4	9	33.16	22	51.4	15	28.88	21	22.
25.5	31.72	18	41.6	17	15.98	26	38.3	9	33.34	18	53.1	17	29.06	18	24.
Dec. 5.5	31.87	15	43.4	18	16.20	22	39.3	10	33.49	15	54.8	17	29.19	13	28.
15.5	31.98	11	45.3	19	16.36	16	40.4	11	33.61	12	56.6	18	29.28	9	31.0
25.5	32.05	7	47.1	18	16.48	12	41.5	11	33.68	7	58.3	17	29.32	4	34.0
35.4	32.08	3	48.8	17	16.54	6	42.5	10	33.72	4	60.0	17	29.31	1	36.8
Sec δ, Tan δ	1.011		−0.146		1.306		+0.840		1.007		−0.122		1.220		−0.700
Mean Place	$27^{\mathrm{s}}.127$		56″.44		$9^{\mathrm{s}}.585$		28″.81		$28^{\mathrm{s}}.726$		67″.54		$24^{\mathrm{s}}.975$		40″.56
$D'_{\psi}\,\alpha$, $D_{\omega}\,\alpha$	0.00		0.00		+0.02		−0.01		0.00		0.00		−0.02		+0.01
$D_{\psi}\,\delta$, $D_{\omega}\,\delta$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	γ Orionis. (*Bellatrix.*) Mag. 1.7				β Tauri. Mag. 1.8				17 Camelop. Mag. 5.8				β Leporis. Mag. 3.0			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 20		+ 6 16		5 20		+28 32		5 22		+62 59		5 24		−20 49	
	s		″		s		″		s		″		s		″	
an. 0.4	36.15		32.0		57.16		21.9		12.03		64.6		38.08		30.9	
10.4	36.17	2	31.1	9	57.20	4	22.3	4	12.04	1	66.8	22	38.08	0	33.1	22
20.4	36.15	2	30.3	8	57.18	2	22.6	3	11.95	9	68.9	21	38.03	5	35.1	20
30.4	36.09	6	29.6	7	57.11	7	22.9	3	11.77	18	70.7	18	37.94	9	36.8	17
eb. 9.3	35.99	10	29.1	5	57.01	10	23.2	3	11.51	26	72.1	14	37.81	13	38.1	13
19.3	35.86	13	28.7	4	56.86	15	23.3	1	11.18	33	73.2	11	37.66	15	39.2	11
lar. 1.3	35.71	15	28.3	4	56.69	17	23.4	1	10.81	37	73.9	7	37.48	18	39.9	7
11.3	35.55	16	28.1	2	56.51	18	23.3	1	10.42	39	74.0	1	37.28	20	40.2	3
21.2	35.38	17	28.0	1	56.33	18	23.1	2	10.03	39	73.7	3	37.08	20	40.2	0
31.2	35.22	16	28.1	1	56.15	18	22.7	4	9.65	38	73.0	7	36.89	19	39.8	4
pr. 10.2	35.08	14	28.2	1	55.99	16	22.3	4	9.31	34	71.9	11	36.72	17	39.0	8
20.1	34.96	12	28.5	3	55.87	12	21.8	5	9.02	29	70.4	15	36.57	15	37.9	11
30.1	34.88	8	28.9	4	55.78	9	21.3	5	8.80	22	68.6	18	36.46	11	36.6	13
lay 10.1	34.84	4	29.4	5	55.73	5	20.8	5	8.67	13	66.6	20	36.38	8	34.9	17
20.1	34.83	1	30.1	7	55.74	1	20.3	5	8.63	4	64.5	21	36.35	3	33.0	19
30.0	34.88	5	30.9	8	55.79	5	19.8	5	8.67	4	62.3	22	36.36	1	30.9	21
une 9.0	34.96	8	31.8	9	55.89	10	19.4	4	8.81	14	60.0	23	36.42	6	28.6	23
19.0	35.09	13	32.8	10	56.04	15	19.2	2	9.03	22	57.9	21	36.52	10	26.2	24
29.0	35.25	16	33.9	11	56.23	19	19.0	2	9.34	31	55.9	20	36.65	13	23.8	24
uly 8.9	35.45	20	35.1	12	56.46	23	18.9	1	9.72	38	54.0	19	36.83	18	21.4	24
18.9	35.68	23	36.2	11	56.72	26	18.9	0	10.17	45	52.4	16	37.04	21	19.1	23
28.9	35.93	25	37.3	11	57.01	29	19.0	1	10.67	50	51.1	13	37.28	24	17.0	21
ug. 7.8	36.20	27	38.4	11	57.32	31	19.2	2	11.21	54	50.0	11	37.54	26	15.1	19
17.8	36.49	29	39.3	9	57.65	33	19.4	2	11.79	58	49.2	8	37.82	28	13.5	16
27.8	36.78	29	40.0	7	57.99	34	19.7	3	12.40	61	48.7	5	38.11	29	12.2	13
ept. 6.8	37.08	30	40.6	6	58.33	34	20.0	3	13.02	62	48.5	2	38.41	30	11.4	8
16.7	37.38	30	41.0	4	58.67	34	20.3	3	13.65	63	48.7	2	38.71	30	11.1	3
26.7	37.68	30	41.1	1	59.01	34	20.6	3	14.28	63	49.2	5	39.01	30	11.2	1
Oct. 6.7	37.97	29	41.0	1	59.35	34	20.9	3	14.89	61	49.9	7	39.30	29	11.8	6
16.7	38.25	28	40.6	4	59.67	32	21.1	2	15.48	59	51.0	11	39.58	28	12.8	10
26.6	38.52	27	40.0	6	59.98	31	21.4	3	16.04	56	52.4	14	39.85	27	14.3	15
Nov. 5.6	38.77	25	39.3	7	60.27	29	21.6	2	16.56	52	54.0	16	40.10	25	16.1	18
15.6	39.01	24	38.4	9	60.54	27	21.9	3	17.03	47	55.9	19	40.32	22	18.2	21
25.5	39.21	20	37.4	10	60.78	24	22.2	3	17.44	41	57.9	20	40.51	19	20.6	24
Dec. 5.5	39.38	17	36.4	10	60.97	19	22.5	3	17.77	33	60.1	22	40.66	15	23.1	25
15.5	39.51	13	35.4	10	61.13	16	22.8	3	18.02	25	62.4	23	40.77	11	25.6	25
25.5	39.61	10	34.3	11	61.25	12	23.2	4	18.18	16	64.8	24	40.84	7	28.1	25
35.4	39.66	5	33.4	9	61.31	6	23.6	4	18.24	6	67.1	23	40.87	3	30.4	23
ec δ, Tan δ	1.006		+0.110		1.138		+0.544		2.203		+1.963		1.070		−0.380	
lean Place	$34^{s}.277$		$24''.75$		$55^{s}.053$		$12''.08$		$8^{s}.323$		$51''$ 64		$36^{s}.199$		$35''.17$	
$D'_{\psi}a$, $D_{\omega}a$	0.00		0.00		+0.01		−0.01		+0.05		−0.02		−0.01		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	χ Aurigæ. Mag. 4.9				δ Orionis. Mag. 2.5				Groombridge 966. Mag. 6.4				α Leporis. Mag. 2.7		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.
	h m 5 27		° ′ +32 7		h m 5 27		° ′ − 0 21		h m 5 28		° ′ +74 59		h m 5 28		° −17
	s		″		s		″		s		″		s		″
Jan. 0.5	13.86		58.4		41.67		34.0		27.27		36.0		60.74		52.0
10.4	13.90	4	59.1	7	41.69	2	35.2	12	27.23	4	38.8	28	60.74	0	54.1
20.4	13.89	1	59.6	5	41.67	2	36.3	11	27.02	21	41.3	25	60.70	4	56.0
30.4	13.83	6	60.1	5	41.61	6	37.3	10	26.66	36	43.6	23	60.62	8	57.6
Feb. 9.3	13.72	11	60.5	4	41.51	10	38.1	8	26.16	50	45.4	18	60.50	12	59.0
19.3	13.57	15	60.8	3	41.38	13	38.7	6	25.55	61	46.8	14	60.35	15	60.0
Mar. 1.3	13.40	17	61.0	2	41.23	15	39.1	4	24.86	69	47.7	9	60.18	17	60.7
11.3	13.21	19	61.0	0	41.07	16	39.4	3	24.13	73	48.1	4	59.99	19	61.0
21.2	13.01	20	60.8	2	40.90	17	39.4	0	23.39	74	47.9	2	59.80	19	61.0
31.2	12.83	18	60.4	4	40.74	16	39.3	1	22.68	71	47.1	8	59.62	18	60.7
Apr. 10.2	12.66	17	60.0	4	40.59	15	39.0	3	22.04	64	45.9	12	59.45	17	60.0
20.2	12.52	14	59.4	6	40.47	12	38.6	4	21.48	56	44.2	17	59.31	14	59.1
30.1	12.43	9	58.8	6	40.38	9	37.9	7	21.04	44	42.2	20	59.19	12	57.8
May 10.1	12.38	5	58.1	7	40.32	6	37.1	8	20.73	31	39.9	23	59.12	7	56.3
20.1	12.37	1	57.4	7	40.31	1	36.1	10	20.57	16	37.3	26	59.09	3	54.5
30.0	12.42	5	56.7	7	40.34	3	34.9	12	20.56	1	34.7	26	59.10	1	52.5
June 9.0	12.52	10	56.1	6	40.42	8	33.7	12	20.71	15	32.0	27	59.15	5	50.4
19.0	12.67	15	55.6	5	40.53	11	32.3	14	21.01	30	29.3	27	59.25	10	48.1
29.0	12.86	19	55.2	4	40.68	15	30.9	14	21.45	44	26.7	26	59.39	14	45.9
July 8.9	13.09	23	54.9	3	40.87	19	29.4	15	22.02	57	24.4	23	59.56	17	43.6
18.9	13.35	26	54.7	2	41.08	21	28.0	14	22.72	70	22.2	22	59.77	21	41.4
28.9	13.65	30	54.6	1	41.32	24	26.6	14	23.52	80	20.4	18	60.00	23	39.4
Aug. 7.8	13.96	31	54.6	0	41.58	26	25.4	12	24.40	88	18.8	16	60.25	25	37.5
17.8	14.30	34	54.6	0	41.86	28	24.3	11	25.36	96	17.7	11	60.53	28	36.0
27.8	14.64	34	54.8	2	42.15	29	23.4	9	26.37	101	16.9	8	60.82	29	34.8
Sept. 6.8	14.99	35	55.0	2	42.44	29	22.8	6	27.41	104	16.5	4	61.11	29	34.0
16.7	15.35	36	55.2	2	42.74	30	22.4	4	28.47	106	16.5	0	61.41	30	33.6
26.7	15.71	36	55.5	3	43.04	30	22.4	0	29.53	106	16.9	4	61.71	30	33.7
Oct. 6.7	16.06	35	55.8	3	43.33	29	22.6	2	30.57	104	17.7	8	62.00	29	34.2
16.7	16.40	34	56.1	3	43.61	28	23.2	6	31.57	100	18.9	12	62.28	28	35.1
26.6	16.72	32	56.4	3	43.87	26	24.0	8	32.52	95	20.4	15	62.55	27	36.5
Nov. 5.6	17.03	31	56.8	4	44.12	25	25.0	10	33.40	88	22.3	19	62.80	25	38.2
15.6	17.31	28	57.2	4	44.35	23	26.3	13	34.18	78	24.5	22	63.03	23	40.2
25.5	17.56	25	57.6	4	44.56	21	27.6	13	34.84	66	27.0	25	63.22	19	42.5
Dec. 5.5	17.77	21	58.1	5	44.73	17	29.1	15	35.38	54	29.7	27	63.38	16	44.8
15.5	17.94	17	58.7	6	44.86	13	30.5	14	35.76	38	32.5	28	63.50	12	47.2
25.5	18.07	13	59.3	6	44.96	10	32.0	15	35.99	23	35.3	28	63.58	8	49.6
35.4	18.14	7	59.8	5	45.01	5	33.3	13	36.05	6	38.1	28	63.61	3	51.8
Sec δ, Tan δ	1.181		+0.628		1.000		−0.006		3.862		+3.730		1.051		−0.323
Mean Place	11ˢ.663		48″.64		39ˢ.809		40″.31		21ˢ.045		22″.90		58ˢ.865		56″.65
D′ψ α, Dω α	+0.02		−0.01		0.00		0.00		+0.10		−0.03		−0.01		0.00
Dψ δ, Dω δ	+0.1		+1.0		+0.1		+1.0		+0.1		+1.0		+0.1		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**ϕ^1 Orionis.** Mag. 4.5				**ι Orionis.** Mag. 2.9				**ε Orionis.** Mag. 1.8				**ζ Tauri.** Mag. 3.0			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 30		+ 9 25		5 31		− 5 57		5 31		− 1 15		5 32		+21 5	
	s		″		s		″		s		″		s		″	
n. 0.5	11.10		65.5		18.34		47.9		55.85		12.9		35.88		38.1	
10.4	11.14	4	64.8	7	18.37	3	49.4	15	55.88	3	14.2	13	35.92	4	38.1	0
20.4	11.13	1	64.2	6	18.35	2	50.8	14	55.86	2	15.4	12	35.92	0	38.1	0
30.4	11.07	6	63.6	6	18.28	7	52.0	12	55.80	6	16.4	10	35.87	5	38.1	0
eb. 9.3	10.98	9	63.2	4	18.18	10	53.0	10	55.71	9	17.2	8	35.77	10	38.1	0
19.3	10.86	12	62.8	4	18.05	13	53.8	8	55.58	13	17.8	6	35.64	13	38.0	1
ar. 1.3	10.71	15	62.5	3	17.89	16	54.3	5	55.43	15	18.3	5	35.49	15	38.0	0
11.3	10.55	16	62.4	1	17.72	17	54.6	3	55.26	17	18.6	3	35.32	17	37.9	1
21.2	10.38	17	62.3	1	17.55	17	54.7	1	55.09	17	18.6	0	35.14	18	37.8	1
31.2	10.21	17	62.2	1	17.38	17	54.5	2	54.93	16	18.5	1	34.97	17	37.6	2
pr. 10.2	10.07	14	62.3	1	17.23	15	54.1	4	54.78	15	18.2	3	34.82	15	37.4	2
20.2	9.95	12	62.5	2	17.10	13	53.5	6	54.65	13	17.7	5	34.70	12	37.2	2
30.1	9.86	9	62.7	2	17.01	9	52.6	9	54.56	9	17.0	7	34.61	9	37.0	2
lay 10.1	9.81	5	63.1	4	16.95	6	51.5	11	54.50	6	16.2	8	34.55	6	36.9	1
20.1	9.80	1	63.6	5	16.93	2	50.3	12	54.49	1	15.2	10	34.55	0	36.8	1
30.0	9.84	4	64.2	6	16.95	2	48.9	14	54.51	2	14.0	12	34.59	4	36.7	1
une 9.0	9.92	8	64.9	7	17.01	6	47.3	16	54.58	7	12.7	13	34.67	8	36.7	0
19.0	10.04	12	65.7	8	17.12	11	45.7	16	54.69	11	11.3	14	34.80	13	36.9	2
29.0	10.20	16	66.6	9	17.26	14	44.0	17	54.84	15	9.8	15	34.97	17	37.1	2
uly 8.9	10.39	19	67.5	9	17.44	18	42.3	17	55.02	18	8.4	14	35.18	21	37.3	2
18.9	10.61	22	68.5	10	17.65	21	40.6	17	55.23	21	6.9	15	35.42	24	37.6	3
28.9	10.86	25	69.4	9	17.89	24	39.0	16	55.47	24	5.5	14	35.68	26	38.0	4
ug. 7.9	11.13	27	70.3	9	18.14	25	37.5	15	55.73	26	4.2	13	35.97	29	38.4	4
17.8	11.42	29	71.1	8	18.42	28	36.3	12	56.00	27	3.1	11	36.27	30	38.8	4
27.8	11.71	29	71.8	7	18.70	28	35.3	10	56.29	29	2.2	9	36.58	31	39.2	4
ept. 6.8	12.01	30	72.3	5	18.99	29	34.6	7	56.58	29	1.6	6	36.90	32	39.5	3
16.7	12.32	31	72.6	3	19.29	30	34.3	3	56.88	30	1.2	4	37.22	32	39.8	3
26.7	12.62	30	72.7	1	19.58	29	34.3	0	57.17	29	1.2	0	37.55	33	39.9	1
ct. 6.7	12.92	30	72.6	1	19.87	29	34.6	3	57.46	29	1.5	3	37.87	32	40.0	1
16.7	13.21	29	72.3	3	20.15	28	35.3	7	57.74	28	2.1	6	38.17	30	40.0	0
26.6	13.48	27	71.8	5	20.42	27	36.3	10	58.01	27	2.9	8	38.47	30	39.9	1
Nov. 5.6	13.75	27	71.1	7	20.67	25	37.6	13	58.27	26	4.0	11	38.76	29	39.7	2
15.6	13.99	24	70.4	7	20.89	22	39.1	15	58.50	23	5.3	13	39.02	26	39.5	2
25.6	14.20	21	69.5	9	21.10	21	40.8	17	58.71	21	6.7	14	39.25	23	39.3	2
Dec. 5.5	14.38	18	68.6	9	21.27	17	42.5	17	58.88	17	8.2	15	39.45	20	39.1	2
15.5	14.53	15	67.7	9	21.40	13	44.3	18	59.02	14	9.8	16	39.61	16	38.9	2
25.5	14.64	11	66.9	8	21.49	9	46.1	18	59.12	10	11.3	15	39.73	12	38.8	1
35.4	14.70	6	66.1	8	21.54	5	47.7	16	59.17	5	12.7	14	39.80	7	38.7	1
ec δ, Tan δ	1.014		+0.166		1.005		−0.104		1.000		−0.022		1.072		+0.386	
lean Place	9ˢ.193		58″.17		16ˢ.491		53″.66		53ˢ.988		19″.10		33ˢ.850		29″.69	
$Y_{\phi}\alpha$, $D_{\omega}\alpha$	0.00		0.00		0.00		0.00		0.00		0.00		+0.01		0.00	
$\lambda\delta$, $D_{\omega}\delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Orionis. Mag. 2.0				α Columbæ. Mag. 2.8				ο Aurigæ. Mag. 5.5				ζ Leporis. Mag. 3.7		
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Decli tion
	h m 5 36 s		° ′ − 1 58 ″		h m 5 36 s		° ′ −34 6 ″		h m 5 39 s		° ′ +49 47 ″		h m 5 43 s		° −14 ″
Jan. 0.5	30.04		66.4		36.28		64.4		21.65		35.4		8.08		65.2
10.4	30.07	3	67.8	14	36.26	2	67.2	28	21.70	5	37.0	16	8.10	2	67.3
20.4	30.06	1	69.0	12	36.19	7	69.7	25	21.68	2	38.5	15	8.08	2	69.1
30.4	30.00	6	70.1	11	36.08	11	71.8	21	21.60	8	39.9	14	8.02	6	70.7
Feb. 9.3	29.91	9	71.0	9	35.92	16	73.6	18	21.46	14	41.0	11	7.91	11	72.0
19.3	29.78	13	71.6	6	35.73	19	75.0	14	21.26	20	41.9	9	7.77	14	73.1
Mar. 1.3	29.63	15	72.1	5	35.51	22	75.9	9	21.02	24	42.5	6	7.61	16	73.8
11.3	29.46	17	72.4	3	35.28	23	76.4	5	20.76	26	42.7	2	7.43	18	74.2
21.2	29.29	17	72.5	1	35.04	24	76.4	0	20.50	26	42.6	1	7.24	19	74.3
31.2	29.13	16	72.4	1	34.81	23	75.9	5	20.24	26	42.2	4	7.06	18	74.1
Apr. 10.2	28.98	15	72.0	4	34.59	22	75.1	8	20.01	23	41.4	8	6.89	17	73.6
20.2	28.85	13	71.5	5	34.40	19	73.8	13	19.81	20	40.4	10	6.75	14	72.8
30.1	28.75	10	70.9	6	34.24	16	72.1	17	19.66	15	39.2	12	6.63	12	71.7
May 10.1	28.69	6	70.0	9	34.13	11	70.2	19	19.56	10	37.8	14	6.55	8	70.3
20.1	28.67	2	68.9	11	34.06	7	67.9	23	19.53	3	36.3	15	6.51	4	68.7
30.0	28.70	3	67.7	12	34.03	3	65.3	26	19.56	3	34.7	16	6.52	1	67.0
June 9.0	28.76	6	66.4	13	34.05	2	62.6	27	19.65	9	33.1	16	6.56	4	65.0
19.0	28.86	10	65.0	14	34.12	7	59.8	28	19.81	16	31.6	15	6.65	9	63.0
29.0	29.01	15	63.5	15	34.24	12	56.9	29	20.02	21	30.1	15	6.77	12	60.9
July 8.9	29.18	17	62.0	15	34.40	16	54.1	28	20.29	27	28.8	13	6.94	17	58.8
18.9	29.39	21	60.5	15	34.60	20	51.3	28	20.61	32	27.6	12	7.13	19	56.7
28.9	29.63	24	59.1	14	34.83	23	48.8	25	20.97	36	26.6	10	7.35	22	54.8
Aug. 7.9	29.88	25	57.8	13	35.09	26	46.6	22	21.35	38	25.8	8	7.60	25	53.0
17.8	30.15	27	56.7	11	35.38	29	44.7	19	21.77	42	25.1	7	7.87	27	51.5
27.8	30.43	28	55.8	9	35.68	30	43.2	15	22.20	43	24.7	4	8.15	28	50.4
Sept. 6.8	30.72	29	55.2	6	36.00	32	42.3	9	22.65	45	24.5	2	8.44	29	49.6
16.7	31.02	30	54.8	4	36.33	33	41.8	5	23.11	46	24.5	0	8.73	29	49.2
26.7	31.32	30	54.8	0	36.65	32	41.9	1	23.57	46	24.7	2	9.03	30	49.2
Oct. 6.7	31.61	29	55.1	3	36.97	32	42.6	7	24.02	45	25.0	3	9.32	29	49.6
16.7	31.89	28	55.7	6	37.28	31	43.8	12	24.46	44	25.6	6	9.61	29	50.5
26.6	32.16	27	56.6	9	37.57	29	45.6	18	24.88	42	26.4	8	9.88	27	51.8
Nov. 5.6	32.42	26	57.7	11	37.84	27	47.8	22	25.28	40	27.4	10	10.14	26	53.4
15.6	32.65	23	59.0	13	38.08	24	50.3	25	25.65	37	28.5	11	10.38	24	55.3
25.6	32.86	21	60.5	15	38.28	20	53.2	29	25.98	33	29.8	13	10.59	21	57.4
Dec. 5.5	33.04	18	62.1	16	38.44	16	56.2	30	26.26	28	31.2	14	10.76	17	59.6
15.5	33.18	14	63.7	16	38.55	11	59.3	31	26.48	22	32.8	16	10.90	14	61.9
25.5	33.29	11	65.2	15	38.62	7	62.3	30	26.64	16	34.4	16	11.00	10	64.2
35.4	33.34	5	66.7	15	38.63	1	65.2	29	26.74	10	36.0	16	11.05	5	66.4
Sec δ, Tan δ	1.001		−0.035		1.208		−0.677		1.549		+1.183		1.035		−0.265
Mean Place	28ˢ.173		72″.54		34ˢ.264		68″.00		18ˢ.817		24″.84		6ˢ.208		70″.26
D′ψ α, Dω α	0.00		0.00		−0.02		0.00		+0.03		−0.01		−0.01		0.00
Dψ δ, Dω δ	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	κ Orionis. Mag. 2.2				δ Doradus. Mag. 4.5				ν Aurigæ. Mag. 4.2				δ Leporis. Mag. 3.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 43		− 9 41		5 44		−65 45		5 45		+39 7		5 47		−20 52	
	s		″		s		″		s		″		s		″	
Jan. 0.5	45.36	3	51.0	19	40.44	18	59.8	34	38.32	6	38.4	10	41.82	2	63.2	24
10.4	45.39	1	52.9	16	40.26	28	63.2	30	38.38	1	39.4	10	41.84	2	65.6	21
20.4	45.38	6	54.5	14	39.98	36	66.2	26	38.39	6	40.4	9	41.82	8	67.7	19
30.4	45.32	10	55.9	11	39.62	43	68.8	22	38.33	10	41.3	8	41.74	11	69.6	16
Feb. 9.4	45.22	13	57.0	10	39.19	50	71.0	17	38.23	15	42.1	6	41.63	15	71.2	12
19.3	45.09	16	58.0	6	38.69	54	72.7	12	38.08	19	42.7	4	41.48	17	72.4	9
Mar. 1.3	44.93	17	58.6	4	38.15	56	73.9	6	37.89	21	43.1	2	41.31	19	73.3	5
11.3	44.76	18	59.0	1	37.59	58	74.5	0	37.68	21	43.3	1	41.12	20	73.8	1
21.2	44.58	17	59.1	2	37.01	56	74.5	5	37.47	21	43.2	2	40.92	19	73.9	2
31.2	44.41	16	58.9	4	36.45	54	74.0	10	37.26	19	43.0	5	40.73	18	73.7	6
Apr. 10.2	44.25	14	58.5	7	35.91	49	73.0	15	37.07	16	42.5	7	40.55	16	73.1	9
20.2	44.11	11	57.8	9	35.42	45	71.5	19	36.91	13	41.8	8	40.39	13	72.2	12
30.1	44.00	7	56.9	12	34.97	37	69.6	24	36.78	8	41.0	10	40.26	9	71.0	15
May 10.1	43.93	3	55.7	13	34.60	30	67.2	27	36.70	2	40.0	10	40.17	5	69.5	17
20.1	43.90	1	54.4	16	34.30	22	64.5	30	36.68	3	39.0	10	40.12	1	67.8	20
30.1	43.91	5	52.8	17	34.08	12	61.5	32	36.71	8	38.0	10	40.11	3	65.8	22
June 9.0	43.96	9	51.1	18	33.96	4	58.3	33	36.79	13	37.0	10	40.14	8	63.6	23
19.0	44.05	13	49.3	18	33.92	6	55.0	34	36.92	18	36.0	9	40.22	12	61.3	23
29.0	44.18	16	47.5	19	33.98	15	51.6	33	37.10	23	35.1	8	40.34	15	59.0	24
July 8.9	44.34	20	45.6	19	34.13	23	48.3	32	37.33	27	34.3	7	40.49	19	56.6	23
18.9	44.54	22	43.7	17	34.36	31	45.1	30	37.60	30	33.6	6	40.68	22	54.3	21
28.9	44.76	25	42.0	16	34.67	39	42.1	26	37.90	33	33.0	4	40.90	24	52.2	19
Aug. 7.9	45.01	26	40.4	13	35.06	45	39.5	22	38.23	35	32.6	4	41.14	27	50.3	16
17.8	45.27	28	39.1	10	35.51	50	37.3	17	38.58	37	32.2	2	41.41	28	48.7	13
27.8	45.55	29	38.1	8	36.01	54	35.6	12	38.95	37	32.0	1	41.69	29	47.4	9
Sept. 6.8	45.84	29	37.3	4	36.55	56	34.4	5	39.32	39	31.9	0	41.98	30	46.5	4
16.8	46.13	30	36.9	0	37.11	56	33.9	1	39.71	38	31.9	1	42.28	31	46.1	0
26.7	46.43	29	36.9	4	37.67	56	34.0	8	40.09	39	32.0	1	42.59	30	46.1	5
Oct. 6.7	46.72	29	37.3	8	38.23	53	34.8	15	40.48	38	32.1	3	42.89	29	46.6	10
16.7	47.01	27	38.1	11	38.76	49	36.3	20	40.86	36	32.4	4	43.18	28	47.6	15
26.6	47.28	26	39.2	15	39.25	44	38.3	26	41.22	34	32.8	5	43.46	26	49.1	18
Nov. 5.6	47.54	24	40.7	16	39.69	36	40.9	30	41.56	32	33.3	6	43.72	24	50.9	21
15.6	47.78	21	42.3	19	40.05	28	43.9	33	41.88	29	33.9	7	43.96	21	53.0	24
25.6	47.99	18	44.2	20	40.33	19	47.2	36	42.17	25	34.6	8	44.17	18	55.4	25
Dec. 5.5	48.17	14	46.2	20	40.52	9	50.8	37	42.42	21	35.4	9	44.35	14	57.9	26
15.5	48.31	10	48.2	20	40.61	2	54.5	36	42.63	15	36.3	9	44.49	10	60.5	26
25.5	48.41	6	50.2	19	40.59	11	58.1	35	42.78	10	37.2	10	44.59	5	63.1	25
35.5	48.47		52.1		40.48		61.6		42.88		38.2		44.64		65.6	
Sec δ, Tan δ	1.015		−0.171		2.436		−2.221		1.289		+0.813		1.070		−0.382	
Mean Place	43ˢ.496		56″.49		37ˢ.108		62″.69		35ˢ.884		29″.15		39ˢ.924		67″.97	
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		0.00		−0.06		+0.01		+0.02		0.00		−0.01		0.00	
$D_\psi \delta$, $D_\omega \delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Orionis. (*Betelgeux.*) Var. 1.0–1.4.				δ Aurigæ. Mag. 3.9				η Leporis. Mag. 3.8				β Aurigæ. Mag. 2.1		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declin tion N
	h m		° ′		h m		° ′		h m		° ′		h m		°
	5 50		+ 7 23		5 52		+54 16		5 52		−14 10		5 53		+44
	s		″		s		″		s		″		s		″
Jan. 0.5	36.12		38.3		34.91		56.4		33.87		51.7		20.33		33.2
10.4	36.17	5	37.4	9	34.98	7	58.2	18	33.91	4	53.7	20	20.40	7	34.5
20.4	36.18	1	36.6	8	34.97	1	60.0	18	33.89	2	55.6	19	20.41	1	35.8
30.4	36.14	4	36.0	6	34.89	8	61.6	16	33.84	5	57.2	16	20.35	6	37.0
Feb. 9.4	36.06	8	35.4	6	34.74	15	63.0	14	33.74	10	58.6	14	20.24	11	38.1
19.3	35.94	12	35.0	4	34.53	21	64.1	11	33.61	13	59.6	10	20.07	17	38.9
Mar. 1.3	35.80	14	34.7	3	34.28	25	64.9	8	33.45	16	60.4	8	19.87	20	39.5
11.3	35.64	16	34.5	2	33.99	29	65.3	4	33.27	18	60.9	5	19.65	22	39.8
21.3	35.47	17	34.4	1	33.69	30	65.4	1	33.08	19	61.0	1	19.41	24	39.9
31.2	35.30	17	34.4	0	33.40	29	65.1	3	32.90	18	60.8	2	19.17	24	39.6
Apr. 10.2	35.15	15	34.5	1	33.13	27	64.4	7	32.73	17	60.4	4	18.95	22	39.1
20.2	35.02	13	34.7	2	32.89	24	63.4	10	32.58	15	59.6	8	18.77	18	38.3
30.1	34.92	10	35.0	3	32.71	18	62.1	13	32.46	12	58.6	10	18.62	15	37.3
May 10.1	34.86	6	35.5	5	32.58	13	60.6	15	32.38	8	57.3	13	18.52	10	36.2
20.1	34.83	3	36.0	5	32.51	7	58.9	17	32.33	5	55.8	15	18.48	4	34.9
30.1	34.85	2	36.7	7	32.52	1	57.1	18	32.33	0	54.1	17	18.50	2	33.6
June 9.0	34.91	6	37.5	8	32.60	8	55.3	18	32.37	4	52.3	18	18.57	7	32.2
19.0	35.01	10	38.3	8	32.74	14	53.5	18	32.44	7	50.3	20	18.70	13	30.9
29.0	35.15	14	39.3	10	32.95	21	51.7	18	32.56	12	48.2	21	18.89	19	29.6
July 8.9	35.32	17	40.3	10	33.22	27	50.1	16	32.72	16	46.1	21	19.12	23	28.5
18.9	35.52	20	41.2	9	33.55	33	48.6	15	32.90	18	44.1	20	19.40	28	27.4
28.9	35.76	24	42.2	10	33.92	37	47.2	14	33.12	22	42.2	19	19.72	32	26.5
Aug. 7.9	36.01	25	43.1	9	34.33	41	46.1	11	33.36	24	40.5	17	20.07	35	25.8
17.8	36.28	27	43.8	7	34.77	44	45.2	9	33.62	26	39.0	15	20.44	37	25.1
27.8	36.57	29	44.4	6	35.24	47	44.5	7	33.90	28	37.8	12	20.83	39	24.7
Sept. 6.8	36.86	29	44.9	5	35.73	49	44.0	5	34.18	28	37.0	8	21.24	41	24.4
16.8	37.16	30	45.1	2	36.22	49	43.8	2	34.47	29	36.6	4	21.66	42	24.2
26.7	37.46	30	45.1	0	36.72	50	43.8	0	34.77	30	36.6	0	22.08	42	24.2
Oct. 6.7	37.76	30	44.9	2	37.22	50	44.0	2	35.07	30	37.0	4	22.50	42	24.4
16.7	38.06	30	44.5	4	37.71	49	44.5	5	35.36	29	37.9	9	22.91	41	24.7
26.6	38.35	29	43.9	6	38.19	48	45.2	7	35.64	28	39.1	12	23.31	40	25.1
Nov. 5.6	38.62	27	43.1	8	38.64	45	46.2	10	35.90	26	40.7	16	23.69	38	25.7
15.6	38.87	25	42.1	10	39.06	42	47.3	11	36.14	24	42.6	19	24.05	36	26.5
25.6	39.10	23	41.1	10	39.43	37	48.7	14	36.36	22	44.7	21	24.37	32	27.5
Dec. 5.5	39.30	20	40.0	11	39.75	32	50.3	16	36.54	18	46.9	22	24.64	27	28.6
15.5	39.47	17	38.9	11	40.01	26	52.0	17	36.69	15	49.2	23	24.87	23	29.7
25.5	39.59	12	37.9	10	40.20	19	53.8	18	36.80	11	51.4	22	25.04	17	31.0
35.5	39.67	8	36.9	10	40.32	12	55.7	19	36.86	6	53.6	22	25.15	11	32.3
Sec δ, Tan δ	1.008		+0.130		1.712		+1.391		1.031		−0.253		1.413		+0.09
Mean Place	34s.187		31″.66		31s.753		46″.62		31s.996		56″.85		17s.660		24″.07
D′ψ α, Dω α	0.00		0.00		+0.04		0.00		−0.01		0.00		+0.03		0.00
Dψ δ, Dω δ	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**θ Aurigæ.** Mag. 2.7				**1 Geminorum.** Mag. 4.3				**1 Puppis (G.).** Mag. 6.2				**ν Orionis.** Mag. 4.4			
	Right Ascension.		**Declination N.**		**Right Ascension.**		**Declination N.**		**Right Ascension.**		**Declination S.**		**Right Ascension.**		**Declination N.**	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	5 53		+37 12		5 58		+23 16		6 2		−45 1		6 2		+14 46	
	s		″		s		″		s		″		s		″	
n. 0.5	57.91	7	36.3	9	59.33	7	15.2	1	3.85	2	65.7	32	45.18	6	53.0	4
10.4	57.98	1	37.2	8	59.40	2	15.3	1	3.83	8	68.9	30	45.24	2	52.6	4
20.4	57.99	4	38.0	9	59.42	3	15.4	1	3.75	14	71.9	26	45.26	2	52.2	3
30.4	57.95	9	38.9	7	59.39	7	15.5	2	3.61	18	74.5	22	45.24	7	51.9	3
eb. 9.4	57.86	14	39.6	6	59.32	12	15.7	1	3.43	23	76.7	18	45.17	11	51.6	1
19.3	57.72	18	40.2	4	59.20	15	15.8	1	3.20	27	78.5	13	45.06	14	51.5	2
ar. 1.3	57.54	20	40.6	2	59.05	17	15.9	0	2.93	28	79.8	8	44.92	16	51.3	0
11.3	57.34	21	40.8	0	58.88	17	15.9	0	2.65	30	80.6	3	44.76	17	51.3	1
21.3	57.13	20	40.8	2	58.71	18	15.9	1	2.35	29	80.9	2	44.59	17	51.2	0
31.2	56.93	19	40.6	4	58.53	16	15.8	1	2.06	28	80.7	7	44.42	16	51.2	0
pr. 10.2	56.74	16	40.2	6	58.37	14	15.7	2	1.78	26	80.0	11	44.26	13	51.2	0
20.2	56.58	13	39.6	7	58.23	11	15.5	3	1.52	23	78.9	16	44.13	11	51.2	1
30.1	56.45	8	38.9	8	58.12	8	15.2	2	1.29	19	77.3	20	44.02	7	51.3	1
lay 10.1	56.37	3	38.1	9	58.04	3	15.0	2	1.10	13	75.3	23	43.95	3	51.4	2
20.1	56.34	2	37.2	10	58.01	2	14.8	2	0.97	8	73.0	27	43.92	1	51.6	3
30.1	56.36	7	36.2	9	58.03	6	14.6	1	0.89	4	70.3	28	43.93	5	51.9	3
une 9.0	56.43	12	35.3	9	58.09	11	14.5	1	0.85	2	67.5	31	43.98	9	52.2	4
19.0	56.55	17	34.4	8	58.20	14	14.4	1	0.87	8	64.4	31	44.07	14	52.6	5
29.0	56.72	22	33.6	7	58.34	19	14.3	1	0.95	12	61.3	31	44.21	17	53.1	5
uly 9.0	56.94	25	32.9	7	58.53	22	14.4	0	1.07	18	58.2	30	44.38	20	53.6	5
18.9	57.19	28	32.2	5	58.75	25	14.4	2	1.25	21	55.2	29	44.58	23	54.1	5
28.9	57.47	32	31.7	5	59.00	27	14.6	1	1.46	26	52.3	25	44.81	26	54.6	5
ug. 7.9	57.79	34	31.2	3	59.27	29	14.7	1	1.72	30	49.8	22	45.07	27	55.1	4
17.8	58.13	35	30.9	3	59.56	31	14.8	1	2.02	32	47.6	18	45.34	29	55.5	4
27.8	58.48	37	30.6	2	59.87	31	14.9	1	2.34	34	45.8	12	45.63	30	55.9	2
ept. 6.8	58.85	37	30.4	0	60.18	33	15.0	0	2.68	35	44.6	7	45.93	31	56.1	1
16.8	59.22	38	30.4	1	60.51	33	15.0	0	3.03	37	43.9	0	46.24	31	56.2	0
26.7	59.60	38	30.3	1	60.84	33	15.0	1	3.40	36	43.9	5	46.55	31	56.2	2
ct. 6.7	59.98	37	30.4	2	61.17	32	14.9	2	3.76	36	44.4	12	46.86	31	56.0	4
16.7	60.35	36	30.6	2	61.49	32	14.7	2	4.12	34	45.6	17	47.17	30	55.6	5
26.7	60.71	34	30.8	3	61.81	30	14.5	3	4.46	31	47.3	23	47.47	29	55.1	6
Nov. 5.6	61.05	32	31.1	5	62.11	29	14.2	2	4.77	28	49.6	27	47.76	27	54.5	6
15.6	61.37	29	31.6	5	62.40	26	14.0	3	5.05	24	52.3	30	48.03	25	53.9	7
25.6	61.66	26	32.1	6	62.66	23	13.7	2	5.29	20	55.3	33	48.28	22	53.2	7
Dec. 5.5	61.92	21	32.7	8	62.89	19	13.5	1	5.49	14	58.6	35	48.50	19	52.5	7
15.5	62.13	16	33.5	8	63.08	15	13.4	1	5.63	8	62.1	34	48.69	14	51.8	6
25.5	62.29	10	34.3	8	63.23	10	13.3	0	5.71	2	65.5	34	48.83	10	51.2	6
35.5	62.39		35.1		63.33		13.3		5.73		68.9		48.93		50.6	
ec δ, Tan δ	1.256		+0.759		1.089		+0.430		1.415		−1.001		1.034		+0.264	
ean Place	$55^{s}.502$		27″.69		$57^{s}.210$		7″.88		$1^{s}.631$		69″.90		$43^{s}.158$		46″.33	
$V_\psi \alpha$, $D_\omega \alpha$	+0.02		0.00		+0.01		0.00		−0.03		0.00		+0.01		0.00	
$\psi \delta$, $D_\omega \delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

Mean Solar Date.	22 H. Camelop. Mag. 4.7				η Geminorum. Var. 3.2–4.2.				2 Lyncis. Mag. 4.4				ζ Canis Majoris Mag. 3.1		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S
	$6^{h}\ 9^{m}$		$+69^{\circ}\ 20'$		$6^{h}\ 9^{m}$		$+22^{\circ}\ 31'$		$6^{h}\ 12^{m}$		$+59^{\circ}\ 2'$		$6^{h}\ 17^{m}$		-30°
	s		″		s		″		s		″		s		″
Jan. 0.5	34.07		74.3		46.98		63.4		11.24		43.8		4.89		26.0
10.5	34.18	11	76.8	25	47.06	8	63.4	0	11.34	10	45.9	21	4.92	3	28.8
20.4	34.15	3	79.3	25	47.09	3	63.5	1	11.36	2	48.0	21	4.91	1	31.5
30.4	34.00	15	81.6	23	47.07	2	63.6	1	11.29	7	50.0	20	4.84	7	33.8
Feb. 9.4	33.73	27	83.7	21	47.00	7	63.7	1	11.13	16	51.6	16	4.72	12	35.
19.3	33.37	36	85.4	17	46.89	11	63.8	1	10.91	22	53.0	14	4.57	15	37.5
Mar. 1.3	32.93	44	86.6	12	46.75	14	63.9	1	10.63	28	54.1	11	4.39	18	38.8
11.3	32.44	49	87.4	8	46.59	16	64.0	1	10.31	32	54.8	7	4.18	21	39.6
21.3	31.92	52	87.7	3	46.42	17	64.0	0	9.96	35	55.1	3	3.96	22	40.
31.2	31.39	53	87.5	2	46.24	18	64.0	0	9.62	34	55.0	1	3.73	23	40.
Apr. 10.2	30.89	50	86.8	7	46.07	17	63.9	1	9.29	33	54.4	6	3.52	21	39.6
20.2	30.44	45	85.7	11	45.93	14	63.8	1	9.00	29	53.5	9	3.33	19	38.8
30.2	30.07	37	84.2	15	45.81	12	63.6	2	8.76	24	52.2	13	3.16	17	37.5
May 10.1	29.78	29	82.3	19	45.74	7	63.4	2	8.58	18	50.7	15	3.03	13	36.
20.1	29.58	20	80.1	22	45.70	4	63.3	1	8.47	11	48.9	18	2.93	10	34.
30.1	29.50	8	77.8	23	45.70	0	63.1	2	8.43	4	47.0	19	2.88	5	32.
June 9.0	29.53	3	75.3	25	45.75	5	63.0	1	8.47	4	44.9	21	2.87	1	29.
19.0	29.66	13	72.7	26	45.84	9	62.9	1	8.59	12	42.9	20	2.90	3	27.
29.0	29.91	25	70.2	25	45.98	14	62.9	0	8.79	20	40.8	21	2.98	8	24.
July 9.0	30.26	35	67.8	24	46.15	17	62.9	0	9.05	26	38.8	20	3.10	12	21.
18.9	30.70	44	65.5	23	46.36	21	63.0	1	9.38	33	37.0	18	3.26	16	19.
28.9	31.23	53	63.4	21	46.60	24	63.1	1	9.76	38	35.3	17	3.45	19	16.
Aug. 7.9	31.83	60	61.6	18	46.86	26	63.2	1	10.19	43	33.7	16	3.68	23	14.
17.9	32.49	66	60.0	16	47.14	28	63.3	1	10.66	47	32.4	13	3.93	25	12.
27.8	33.20	71	58.7	13	47.44	30	63.3	0	11.17	51	31.3	11	4.21	28	10.
Sept. 6.8	33.95	75	57.7	10	47.75	31	63.3	0	11.70	53	30.5	8	4.50	29	9.
16.8	34.73	78	57.1	6	48.07	32	63.3	0	12.25	55	30.0	5	4.81	31	9.
26.7	35.53	80	56.8	3	48.40	33	63.2	1	12.81	56	29.7	3	5.12	31	9.
Oct. 6.7	36.33	80	56.9	1	48.73	33	63.0	2	13.37	56	29.7	0	5.44	32	9.
16.7	37.12	79	57.3	4	49.06	33	62.7	3	13.93	56	30.0	3	5.75	31	10.
26.7	37.88	76	58.2	9	49.38	32	62.4	3	14.48	55	30.5	5	6.06	31	11.
Nov. 5.6	38.61	73	59.4	12	49.69	31	62.0	4	15.00	52	31.4	9	6.35	29	13.
15.6	39.29	68	60.9	15	49.98	29	61.7	3	15.49	49	32.6	12	6.62	27	16.
25.6	39.89	60	62.8	19	50.25	27	61.4	3	15.93	44	34.0	14	6.86	24	18.
Dec. 5.6	40.40	51	64.9	21	50.48	23	61.1	3	16.31	38	35.6	16	7.07	21	21.
15.5	40.82	42	67.2	23	50.68	20	60.8	3	16.63	32	37.4	18	7.23	16	24.
25.5	41.12	30	69.7	25	50.84	16	60.6	2	16.88	25	39.4	20	7.35	12	27.
35.5	41.30	18	72.2	25	50.95	11	60.5	1	17.03	15	41.5	21	7.42	7	30.
Sec δ, Tan δ	2.836		+2.654		1.083		+0.415		1.944		+1.667		1.155		−0.5
Mean Place	$28^{s}.988$		$65''.37$		$44^{s}.853$		$56''.66$		$7^{s}.607$		$35''.59$		$2^{s}.925$		$30''.9$
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.07		+0.01		+0.01		0.00		+0.05		+0.01		−0.02		0.0
$D_{\psi}\delta$, $D_{\omega}\delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	μ Geminorum. Mag. 3.2				ψ^1 Aurigæ. Mag. 5.1				β Canis Majoris. Mag. 2.0				8 Monocerotis. Mag. 4.5			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 6 17		° ′ +22 33		h m 6 18		° ′ +49 19		h m 6 18		° ′ −17 54		h m 6 19		° ′ + 4 38	
	s		″		s		″		s		″		s		″	
an. 0.5	51.26		36.0		24.25		64.6		59.26		41.1		17.81		18.7	
10.5	51.35	9	36.0	0	24.36	11	66.1	15	59.32	6	43.5	24	17.88	7	17.5	12
20.4	51.39	4	36.0	0	24.39	3	67.7	16	59.33	1	45.6	21	17.91	3	16.5	10
30.4	51.38	1	36.1	1	24.36	3	69.2	15	59.28	5	47.6	20	17.90	1	15.6	9
eb. 9.4	51.32	6	36.3	2	24.26	10	70.6	14	59.20	8	49.2	16	17.84	6	14.9	7
19.3	51.22	10	36.4	1	24.10	16	71.7	11	59.07	13	50.5	13	17.74	10	14.4	5
ar. 1.3	51.08	14	36.5	1	23.89	21	72.6	9	58.92	15	51.5	10	17.60	14	14.0	4
11.3	50.92	16	36.6	1	23.65	24	73.2	6	58.74	18	52.2	7	17.45	15	13.7	3
21.3	50.74	18	36.7	1	23.39	26	73.5	3	58.55	19	52.5	3	17.29	16	13.6	1
31.2	50.57	17	36.7	0	23.13	26	73.5	0	58.36	19	52.5	0	17.12	17	13.6	0
pr. 10.2	50.40	17	36.6	1	22.88	25	73.1	4	58.18	18	52.2	3	16.96	16	13.8	2
20.2	50.25	15	36.5	1	22.66	22	72.4	7	58.02	16	51.6	6	16.82	14	14.0	2
30.2	50.13	12	36.4	1	22.48	18	71.5	9	57.88	14	50.6	10	16.70	12	14.4	4
ay 10.1	50.05	8	36.2	2	22.34	14	70.3	12	57.77	11	49.3	13	16.62	8	14.9	5
20.1	50.01	4	36.0	2	22.26	8	69.0	13	57.70	7	47.8	15	16.57	5	15.6	7
30.1	50.00	1	35.8	2	22.24	2	67.5	15	57.67	3	46.1	17	16.56	1	16.3	7
ne 9.0	50.05	5	35.7	1	22.28	4	65.9	16	57.68	1	44.2	19	16.59	3	17.2	9
19.0	50.13	8	35.6	1	22.38	10	64.3	16	57.73	5	42.2	20	16.67	8	18.1	9
29.0	50.26	13	35.6	0	22.54	16	62.7	16	57.82	9	40.0	22	16.78	11	19.1	10
ly 9.0	50.42	16	35.6	0	22.76	22	61.2	15	57.95	13	37.8	22	16.92	14	20.1	10
18.9	50.62	20	35.6	0	23.02	26	59.8	14	58.11	16	35.7	21	17.10	18	21.1	10
28.9	50.85	23	35.6	0	23.33	31	58.4	14	58.30	19	33.7	20	17.31	21	22.1	10
ug. 7.9	51.11	26	35.7	1	23.68	35	57.2	12	58.52	22	31.9	18	17.54	23	23.0	9
17.9	51.39	28	35.7	0	24.06	38	56.2	10	58.77	25	30.3	16	17.79	25	23.8	8
27.8	51.68	29	35.7	0	24.46	40	55.3	9	59.03	26	29.0	13	18.06	27	24.4	6
ept. 6.8	51.99	31	35.7	0	24.89	43	54.6	7	59.31	28	28.0	10	18.34	28	24.8	4
16.8	52.31	32	35.6	1	25.33	44	54.1	5	59.60	29	27.5	5	18.63	29	24.9	1
26.7	52.64	33	35.4	2	25.78	45	53.8	3	59.90	30	27.4	1	18.93	30	24.9	0
ct. 6.7	52.97	33	35.1	3	26.24	46	53.6	2	60.20	30	27.8	4	19.23	30	24.6	3
16.7	53.30	33	34.8	3	26.69	45	53.7	1	60.50	30	28.7	9	19.53	30	24.0	6
26.7	53.62	32	34.4	4	27.13	44	54.0	3	60.79	29	30.0	13	19.82	29	23.2	8
ov. 5.6	53.93	31	34.0	4	27.56	43	54.4	4	61.07	28	31.6	16	20.11	29	22.1	11
15.6	54.23	30	33.6	4	27.97	41	55.1	7	61.33	26	33.6	20	20.38	27	21.0	11
25.6	54.50	27	33.2	4	28.34	37	56.1	10	61.57	24	35.9	23	20.63	25	19.7	13
Dec. 5.6	54.75	25	32.8	4	28.67	33	57.2	11	61.78	21	38.3	24	20.85	22	18.3	14
15.5	54.96	21	32.5	3	28.95	28	58.5	13	61.95	17	40.8	25	21.04	19	17.0	13
25.5	55.13	17	32.3	2	29.16	21	59.9	14	62.08	13	43.3	25	21.19	15	15.7	13
35.5	55.24	11	32.2	1	29.31	15	61.4	15	62.17	9	45.8	25	21.30	11	14.4	13
c δ, Tan δ	1.083		+0.415		1.534		+1.164		1.051		−0.323		1.003		+0.081	
ean Place	49^{s}.125		29″.65		21^{s}.286		57″.25		57^{s}.372		46″.37		15^{s}.865		12″.90	
$_\psi\alpha$, $D_\omega\alpha$	+0.01		0.00		+0.03		+0.01		−0.01		0.00		0.00		0.00	
$_\psi\delta$, $D_\omega\delta$	0.0		+1.0		0.0		+1.0		0.0		+1.0		0.0		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Argûs. (*Canopus.*) Mag. −0.9				10 Monocerotis. Mag. 5.0				ν Geminorum. Mag. 4.1				8 Lyncis. Mag. 6.0			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 6 22		° ′ −52 38		h m 6 23		° ′ − 4 42		h m 6 23		° ′ +20 16		h m 6 29		° +61	
	s		″		s		″		s		″		s		″	
Jan. 0.5	6.32		51.1		47.69		25.9		57.09		7.0		59.59		33.2	
10.5	6.30	2	54.6	35	47.76	7	27.6	17	57.19	10	6.8	2	59.73	14	35.4	
20.4	6.21	9	57.8	32	47.79	3	29.1	15	57.23	4	6.7	1	59.78	5	37.6	
30.4	6.06	15	60.7	29	47.77	2	30.5	14	57.22	1	6.6	1	59.72	6	39.7	
Feb. 9.4	5.85	21	63.3	26	47.70	7	31.6	11	57.17	5	6.7	1	59.58	14	41.6	
19.4	5.58	27	65.4	21	47.60	10	32.5	9	57.07	10	6.7	0	59.35	23	43.2	
Mar. 1.3	5.27	31	67.1	17	47.46	14	33.2	7	56.94	13	6.8	1	59.06	29	44.3	
11.3	4.93	34	68.2	11	47.31	15	33.7	5	56.78	16	6.9	1	58.73	33	45.5	
21.3	4.57	36	68.8	6	47.14	17	33.9	2	56.61	17	6.9	0	58.36	37	46.0	
31.2	4.22	35	68.9	1	46.97	17	33.9	0	56.43	18	7.0	1	57.98	38	46.0	
Apr. 10.2	3.87	35	68.4	5	46.80	17	33.7	2	56.27	16	7.0	0	57.62	36	45.7	
20.2	3.54	33	67.5	9	46.65	15	33.3	4	56.12	15	6.9	1	57.28	34	44.9	
30.2	3.25	29	66.1	14	46.53	12	32.6	7	56.00	12	6.9	0	57.00	28	43.7	
May 10.1	3.00	25	64.3	18	46.44	9	31.8	8	55.91	9	6.8	1	56.77	23	42.2	
20.1	2.79	21	62.0	23	46.38	6	30.8	10	55.87	4	6.7	1	56.62	15	40.4	
30.1	2.64	15	59.4	26	46.36	2	29.6	12	55.86	1	6.7	0	56.54	8	38.4	
June 9.1	2.55	9	56.6	28	46.38	2	28.3	13	55.89	3	6.7	0	56.54	0	36.3	
19.0	2.52	3	53.5	31	46.44	6	26.9	14	55.97	8	6.7	0	56.63	9	34.1	
29.0	2.56	4	50.3	32	46.54	10	25.5	14	56.09	12	6.8	1	56.80	17	31.9	
July 9.0	2.65	9	47.1	32	46.67	13	24.0	15	56.25	16	6.9	1	57.04	24	29.7	
18.9	2.79	14	44.0	31	46.84	17	22.4	16	56.44	19	7.0	1	57.35	31	27.6	
28.9	3.00	21	41.0	30	47.03	19	21.0	14	56.66	22	7.2	2	57.73	38	25.6	
Aug. 7.9	3.25	25	38.2	28	47.25	22	19.7	13	56.91	25	7.3	1	58.16	43	23.8	
17.9	3.55	30	35.8	24	47.50	25	18.6	11	57.18	27	7.4	1	58.64	48	22.2	
27.8	3.89	34	33.8	20	47.76	26	17.7	9	57.46	28	7.4	0	59.16	52	20.8	
Sept. 6.8	4.26	37	32.4	14	48.03	27	17.1	6	57.76	30	7.4	0	59.71	55	19.7	
16.8	4.66	40	31.5	9	48.32	29	16.7	4	58.08	32	7.3	1	60.29	58	18.8	
26.8	5.07	41	31.2	3	48.61	29	16.8	1	58.40	32	7.1	2	60.89	60	18.3	
Oct. 6.7	5.48	41	31.6	4	48.91	30	17.1	3	58.72	32	6.8	3	61.49	60	18.0	
16.7	5.89	41	32.6	10	49.20	29	17.8	7	59.05	33	6.4	4	62.10	61	18.0	
26.7	6.28	39	34.2	16	49.50	30	18.8	10	59.37	32	5.9	5	62.69	59	18.4	
Nov. 5.6	6.65	37	36.4	22	49.78	28	20.1	13	59.68	31	5.3	6	63.26	57	19.1	
15.6	6.98	33	39.1	27	50.05	27	21.7	16	59.97	29	4.8	5	63.80	54	20.1	
25.6	7.26	28	42.2	31	50.29	24	23.4	17	60.25	28	4.2	6	64.30	50	21.4	
Dec. 5.6	7.49	23	45.6	34	50.51	22	25.2	18	60.49	24	3.7	5	64.74	44	23.0	
15.5	7.66	17	49.2	36	50.69	18	27.1	19	60.70	21	3.3	4	65.11	37	24.8	
25.5	7.76	10	52.8	36	50.84	15	29.0	19	60.88	18	2.9	4	65.40	29	26.8	
35.5	7.79	3	56.4	36	50.94	10	30.8	18	61.00	12	2.6	3	65.60	20	29.0	
Sec δ, Tan δ	1.648		−1.310		1.003		−0.082		1.066		+0.369		2.100		+1.8	
Mean Place	3ˢ.901		56″.20		45ˢ.790		31″.38		54ˢ.979		0″.97		55ˢ.621		26″.6	
D′ψ α, Dω α	−0.03		−0.01		0.00		0.00		+0.01		0.00		+0.05		+0.02	
Dψ δ, Dω δ	0.0		+1.0		0.0		+1.0		0.0		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	ξ² Canis Majoris. Mag. 4.5				23 H. Camelop. Mag. 5.6				51 Aurigæ. Mag. 5.7				γ Geminorum. Mag. 1.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 6 31		° ′ −22 53		h m 6 31		° ′ +79 39		h m 6 32		° ′ +39 27		h m 6 32		° ′ +16 28	
	s		″		s		″		s		″		s		″	
n. 0.5	31.56		41.1		54.79		39.6		48.79		66.6		50.19		27.4	
10.5	31.62	6	43.7	26	55.01	22	42.6	30	48.91	12	67.6	10	50.29	10	26.9	5
20.4	31.63	1	46.2	25	54.98	3	45.5	29	48.97	6	68.6	10	50.34	5	26.6	3
30.4	31.59	4	48.4	22	54.71	27	48.2	27	48.96	1	69.6	10	50.34	0	26.4	2
eb. 9.4	31.51	8	50.3	19	54.21	50	50.7	25	48.90	6	70.6	10	50.30	4	26.2	2
19.4	31.38	13	51.8	15	53.50	71	52.8	21	48.78	12	71.5	9	50.21	9	26.1	1
ar. 1.3	31.22	16	53.0	12	52.63	87	54.5	17	48.62	16	72.2	7	50.08	13	26.1	0
11.3	31.04	18	53.9	9	51.64	99	55.7	12	48.43	19	72.7	5	49.93	15	26.1	0
21.3	30.84	20	54.3	4	50.57	107	56.3	6	48.22	21	73.0	3	49.76	17	26.1	0
31.2	30.64	20	54.4	1	49.48	109	56.4	1	48.01	21	73.1	1	49.59	17	26.2	1
pr. 10.2	30.45	19	54.1	3	48.42	106	55.9	5	47.80	21	73.0	1	49.43	16	26.2	0
20.2	30.27	18	53.5	6	47.43	99	54.8	11	47.61	19	72.6	4	49.28	15	26.3	1
30.2	30.12	15	52.6	9	46.55	88	53.2	16	47.46	15	72.0	6	49.16	12	26.3	0
ay 10.1	29.99	13	51.3	13	45.82	73	51.3	19	47.34	12	71.3	7	49.07	9	26.4	1
20.1	29.90	9	49.7	16	45.26	56	49.0	23	47.27	7	70.4	9	49.02	5	26.5	1
30.1	29.85	5	47.9	18	44.90	36	46.4	26	47.24	3	69.4	10	49.00	2	26.7	2
ne 9.1	29.85	0	45.8	21	44.75	15	43.5	29	47.27	3	68.4	10	49.03	3	26.9	2
19.0	29.88	3	43.6	22	44.81	6	40.6	29	47.35	8	67.3	11	49.10	7	27.1	2
29.0	29.95	7	41.3	23	45.08	27	37.6	30	47.48	13	66.2	11	49.20	10	27.4	3
ly 9.0	30.06	11	38.9	24	45.56	48	34.7	29	47.65	17	65.2	10	49.35	15	27.7	3
18.9	30.21	15	36.6	23	46.23	67	31.9	28	47.87	22	64.2	10	49.53	18	28.0	3
28.9	30.39	18	34.4	22	47.07	84	29.2	27	48.12	25	63.2	10	49.73	20	28.3	3
ug. 7.9	30.60	21	32.4	20	48.08	101	26.8	24	48.41	29	62.4	8	49.97	24	28.5	2
17.9	30.84	24	30.6	18	49.23	115	24.7	21	48.72	31	61.6	8	50.23	26	28.7	2
27.8	31.10	26	29.2	14	50.50	127	22.9	18	49.06	34	60.9	7	50.50	27	28.9	2
ept. 6.8	31.37	27	28.1	11	51.86	136	21.4	15	49.42	36	60.2	7	50.79	29	28.9	0
16.8	31.66	29	27.5	6	53.30	144	20.3	11	49.79	37	59.7	5	51.09	30	28.8	1
26.8	31.96	30	27.3	2	54.79	149	19.6	7	50.17	38	59.2	5	51.40	31	28.6	2
ct. 6.7	32.27	31	27.7	4	56.30	151	19.4	2	50.56	39	58.9	3	51.72	32	28.2	4
16.7	32.58	31	28.5	8	57.81	151	19.6	2	50.95	39	58.6	3	52.04	32	27.7	5
26.7	32.88	30	29.8	13	59.28	147	20.2	6	51.34	39	58.5	1	52.36	32	27.1	6
ov. 5.6	33.17	29	31.6	18	60.69	141	21.3	11	51.72	38	58.5	0	52.66	30	26.3	8
15.6	33.45	28	33.7	21	62.00	131	22.8	15	52.08	36	58.7	2	52.96	30	25.6	7
25.6	33.70	25	36.1	24	63.17	117	24.7	19	52.42	34	59.0	3	53.23	27	24.8	8
ec. 5.6	33.92	22	38.7	26	64.19	102	26.9	22	52.72	30	59.5	5	53.48	25	24.0	8
15.5	34.10	18	41.5	28	65.02	83	29.4	25	52.98	26	60.1	6	53.70	22	23.3	7
25.5	34.24	14	44.3	28	65.63	61	32.2	28	53.19	21	60.9	8	53.87	17	22.6	7
35.5	34.33	9	47.0	27	66.00	37	35.1	29	53.34	15	61.8	9	54.00	13	22.1	5
c δ, Tan δ	1.086		−0.422		5.572		+5.481		1.295		+0.823		1.043		+0.296	
an Place	29ˢ.654		46″.43		44ˢ.976		32″.76		46ˢ.215		60″.74		48ˢ.129		21″.89	
$\psi\alpha$, $D_{\omega}\alpha$	−0.01		0.00		+0.14		+0.05		+0.02		+0.01		+0.01		0.00	
$\psi\delta$, $D_{\omega}\delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ν Argûs. Mag. 3.2				S Monocerotis. Mag. 4.7				ε Geminorum. Mag. 3.2				ξ Geminorum. Mag. 3.4		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Decli tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	6 35		−43 6		6 36		+ 9 58		6 38		+25 12		6 40		+12
	s		″		s		″		s		″		s		″
Jan. 0.5	11.84		69.8		19.83		36.2		44.42		64.0		33.19		22.6
10.5	11.87	3	73.1	33	19.93	10	35.3	9	44.53	11	64.1	1	33.29	10	21.9
20.4	11.84	3	76.2	31	19.98	5	34.6	7	44.59	6	64.3	2	33.35	6	21.4
30.4	11.75	9	79.1	29	19.98	0	34.0	6	44.60	1	64.5	2	33.35	0	20.9
Feb. 9.4	11.60	15	81.7	26	19.93	5	33.5	5	44.55	5	64.8	3	33.31	4	20.6
19.4	11.41	19	83.8	21	19.84	9	33.1	4	44.46	9	65.1	3	33.23	8	20.3
Mar. 1.3	11.18	23	85.4	16	19.72	12	32.9	2	44.33	13	65.4	3	33.11	12	20.2
11.3	10.92	26	86.6	12	19.58	14	32.8	1	44.17	16	65.6	2	32.96	15	20.1
21.3	10.65	27	87.4	8	19.42	16	32.7	1	44.00	17	65.8	2	32.80	16	20.1
31.3	10.37	28	87.6	2	19.25	17	32.7	0	43.82	18	65.9	1	32.63	17	20.2
Apr. 10.2	10.09	28	87.3	3	19.09	16	32.8	1	43.65	17	65.9	0	32.47	16	20.3
20.2	9.83	26	86.6	7	18.94	15	33.0	2	43.49	16	65.8	1	32.32	15	20.4
30.2	9.60	23	85.4	12	18.82	12	33.2	2	43.36	13	65.7	1	32.19	13	20.5
May 10.1	9.41	19	83.8	16	18.72	10	33.5	3	43.26	10	65.5	2	32.10	9	20.7
20.1	9.25	16	81.8	20	18.67	5	33.9	4	43.20	6	65.2	3	32.04	6	21.0
30.1	9.14	11	79.5	23	18.65	2	34.4	5	43.18	2	64.9	3	32.02	2	21.3
June 9.1	9.07	7	76.9	26	18.67	2	34.9	5	43.20	2	64.7	2	32.04	2	21.6
19.0	9.06	1	74.0	29	18.73	6	35.5	6	43.27	7	64.4	3	32.10	6	22.0
29.0	9.10	4	71.1	29	18.83	10	36.1	6	43.38	11	64.1	3	32.19	9	22.5
July 9.0	9.18	8	68.1	30	18.96	13	36.8	7	43.52	14	63.9	2	32.33	14	23.0
19.0	9.32	14	65.1	30	19.13	17	37.4	6	43.70	18	63.6	3	32.49	16	23.4
28.9	9.50	18	62.3	28	19.33	20	38.1	7	43.92	22	63.4	2	32.69	20	23.9
Aug. 7.9	9.72	22	59.7	26	19.55	22	38.7	6	44.16	24	63.2	2	32.91	22	24.3
17.9	9.97	25	57.3	24	19.80	25	39.1	4	44.43	27	63.0	2	33.16	25	24.6
27.8	10.26	29	55.4	19	20.06	26	39.5	4	44.72	29	62.8	2	33.42	26	24.8
Sept. 6.8	10.58	32	54.0	14	20.34	28	39.7	2	45.03	31	62.5	3	33.70	28	24.9
16.8	10.92	34	53.1	9	20.63	29	39.7	0	45.35	32	62.2	3	34.00	30	24.8
26.8	11.27	35	52.7	4	20.93	30	39.5	2	45.68	33	61.8	4	34.30	30	24.6
Oct. 6.7	11.63	36	52.9	2	21.24	31	39.1	4	46.01	33	61.4	4	34.61	31	24.2
16.7	11.99	36	53.8	9	21.55	31	38.5	6	46.35	34	61.0	4	34.93	32	23.6
26.7	12.34	35	55.3	15	21.86	31	37.7	8	46.69	34	60.5	5	35.24	31	22.8
Nov. 5.7	12.67	33	57.3	20	22.16	30	36.8	9	47.02	33	60.0	5	35.54	30	22.0
15.6	12.98	31	59.9	26	22.44	28	35.8	10	47.33	31	59.5	5	35.84	30	21.0
25.6	13.26	28	62.8	29	22.71	27	34.7	11	47.63	30	59.1	4	36.11	27	20.0
Dec. 5.6	13.49	23	66.0	32	22.95	24	33.5	12	47.90	27	58.8	3	36.36	25	19.0
15.5	13.67	18	69.4	34	23.16	21	32.4	11	48.13	23	58.6	2	36.58	22	18.1
25.5	13.80	13	72.9	35	23.33	17	31.4	10	48.32	19	58.4	2	36.75	17	17.2
35.5	13.87	7	76.3	34	23.46	13	30.4	10	48.47	15	58.4	0	36.89	14	16.4
Sec δ, Tan δ	1.370		−0.936		1.015		+0.176		1.105		+0.471		1.026		+0.2
Mean Place	9ˢ.709		75″.40		17ˢ.836		30″.86		42ˢ.204		58″.74		31ˢ.160		17″.48
$D'_\psi \alpha$, $D_\omega \alpha$	−0.02		−0.01		0.00		0.00		+0.01		+0.01		+0.01		0.00
$_\psi \delta$, $D_\omega \delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	*ψ*⁵ Aurigæ. Mag. 5.3				*α* Canis Majoris. (*Sirius.*) Mag. –1.6				18 Monocerotis. Mag. 4.7				43 Camelop. Mag. 5.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 6 40		° ′ +43 39		h m 6 41		° ′ –16 35		h m 6 43		° ′ + 2 30		h m 6 44		° ′ +68 59	
	s		″		s		″		s		″		s		″	
an. 0.5	39.71		52.7		25.88		51.0		27.64		26.9		38.09		25.2	
10.5	39.84	13	53.9	12	25.96	8	53.4	24	27.74	10	25.6	13	38.28	19	27.7	25
20.4	39.91	7	55.2	13	25.98	2	55.6	22	27.79	5	24.4	12	38.35	7	30.3	26
30.4	39.91	0	56.5	13	25.96	2	57.6	20	27.79	0	23.4	10	38.29	6	32.7	24
eb. 9.4	39.85	6	57.7	12	25.89	7	59.3	17	27.75	4	22.5	9	38.11	18	35.0	23
19.4	39.73	12	58.8	11	25.78	11	60.7	14	27.66	9	21.8	7	37.82	29	37.0	20
ar. 1.3	39.56	17	59.7	9	25.63	15	61.8	11	27.54	12	21.3	5	37.43	39	38.6	16
11.3	39.36	20	60.4	7	25.46	17	62.6	8	27.40	14	21.0	3	36.98	45	39.8	12
21.3	39.14	22	60.8	4	25.28	18	63.1	5	27.24	16	20.8	2	36.48	50	40.6	8
31.3	38.91	23	61.0	2	25.09	19	63.2	1	27.07	17	20.8	0	35.97	51	40.8	2
pr. 10.2	38.69	22	60.9	1	24.91	18	63.0	2	26.91	16	20.9	1	35.46	51	40.5	3
20.2	38.48	21	60.5	4	24.74	17	62.5	5	26.76	15	21.2	3	34.99	47	39.8	7
30.2	38.30	18	59.9	6	24.60	14	61.7	8	26.63	13	21.6	4	34.57	42	38.6	12
ay 10.1	38.17	13	59.1	8	24.49	11	60.6	11	26.53	10	22.1	5	34.22	35	37.1	15
20.1	38.08	9	58.1	10	24.41	8	59.3	13	26.47	6	22.8	7	33.96	26	35.2	19
30.1	38.04	4	56.9	12	24.36	5	57.8	15	26.44	3	23.6	8	33.80	16	33.0	22
ne 9.1	38.06	2	55.6	13	24.35	1	56.0	18	26.45	1	24.5	9	33.74	6	30.6	24
19.0	38.13	7	54.3	13	24.39	4	54.1	19	26.50	5	25.5	10	33.79	5	28.1	25
29.0	38.25	12	53.0	13	24.46	7	52.2	19	26.59	9	26.5	10	33.94	15	25.5	26
ly 9.0	38.42	17	51.7	13	24.57	11	50.2	20	26.71	12	27.5	10	34.20	26	22.9	26
19.0	38.64	22	50.5	12	24.72	15	48.2	20	26.87	16	28.6	11	34.55	35	20.4	25
28.9	38.90	26	49.3	12	24.90	18	46.3	19	27.05	18	29.6	10	34.99	44	18.1	23
ug. 7.9	39.19	29	48.1	12	25.10	20	44.6	17	27.26	21	30.5	9	35.51	52	15.9	22
17.9	39.52	33	47.1	10	25.33	23	43.1	15	27.49	23	31.3	8	36.09	58	13.9	20
27.8	39.87	35	46.2	9	25.58	25	41.9	12	27.74	25	31.9	6	36.74	65	12.1	18
pt. 6.8	40.24	37	45.3	9	25.85	27	41.1	8	28.01	27	32.3	4	37.44	70	10.6	15
16.8	40.63	39	44.6	7	26.13	28	40.6	5	28.29	28	32.5	2	38.18	74	9.5	11
26.8	41.04	41	44.1	5	26.42	29	40.5	1	28.59	30	32.4	1	38.94	76	8.6	9
ct. 6.7	41.46	42	43.6	5	26.72	30	40.9	4	28.89	30	32.0	4	39.72	78	8.2	4
16.7	41.87	41	43.3	3	27.02	30	41.8	9	29.19	30	31.3	7	40.51	79	8.1	1
26.7	42.28	41	43.2	1	27.32	30	43.1	13	29.49	30	30.3	10	41.29	78	8.4	3
ov. 5.7	42.69	41	43.3	1	27.61	29	44.7	16	29.78	29	29.2	11	42.05	76	9.0	6
15.6	43.08	39	43.5	2	27.89	28	46.7	20	30.07	29	27.9	13	42.76	71	10.1	11
25.6	43.44	36	44.0	5	28.14	25	49.0	23	30.33	26	26.4	15	43.42	66	11.5	14
ec. 5.6	43.76	32	44.6	6	28.36	22	51.4	24	30.57	24	24.8	16	44.00	58	13.2	17
15.5	44.05	29	45.4	8	28.55	19	54.0	26	30.78	21	23.3	15	44.50	50	15.3	21
25.5	44.28	23	46.4	10	28.70	15	56.6	26	30.95	17	21.8	15	44.89	39	17.6	23
35.5	44.45	17	47.6	12	28.80	10	59.1	25	31.08	13	20.4	14	45.16	27	20.0	24
δ, Tan *δ*	1.382		+0.954		1.043		–0.298		1.001		+0.044		2.789		+2.604	
n Place	36ˢ.961		47″.46		24ˢ.147		55″.77		25ˢ.707		21″.80		32ˢ.874		19″.96	
α, D_{ψ} *α*	+0.02		+0.01		–0.01		0.00		0.00		0.00		+0.07		+0.03	
δ, D_{ψ} *δ*	–0.1		+1.0		–0.1		+1.0		–0.1		+1.0		–0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ζ Mensæ.** Mag. 5.6 Right Ascension.		**ζ Mensæ.** Declination S.		**θ Geminorum.** Mag. 3.6 Right Ascension.		**θ Geminorum.** Declination N.		**α Pictoris.** Mag. 3.3 Right Ascension.		**α Pictoris.** Declination S.		**τ Argus.** Mag. 2.8 Right Ascension.		**τ Argus.** Decl tion
	h m		° ′		h m		° ′		h m		° ′		h m		
	6 46		−80 43		6 47		+34 3		6 47		−61 50		6 47		−50
	s		″		s		″		s		″		s		″
Jan. 0.5	75.37		23.0		13.75		58.1		22.05		53.5		51.89		41.4
10.5	75.07	30	26.5	35	13.88	13	58.7	6	22.04	1	57.2	37	51.92	3	45.0
20.5	74.52	55	30.0	35	13.96	8	59.4	7	21.93	11	60.7	35	51.88	4	48.4
30.4	73.73	79	33.3	33	13.97	1	60.1	7	21.74	19	64.0	33	51.78	10	51.5
Feb. 9.4	72.73	100	36.2	29	13.93	4	60.9	8	21.47	27	66.9	29	51.61	17	54.3
19.4	71.55	118	38.7	25	13.83	10	61.6	7	21.13	34	69.4	25	51.38	23	56.7
Mar. 1.3	70.21	134	40.8	21	13.70	13	62.2	6	20.73	40	71.4	20	51.11	27	58.6
11.3	68.77	144	42.4	16	13.53	17	62.7	5	20.29	44	73.0	16	50.81	30	60.1
21.3	67.26	151	43.5	11	13.34	19	63.1	4	19.83	46	74.0	10	50.49	32	61.1
31.3	65.72	154	44.0	5	13.14	20	63.2	1	19.35	48	74.5	5	50.16	33	61.5
Apr. 10.2	64.18	154	44.0	0	12.95	19	63.2	0	18.87	48	74.4	1	49.83	33	61.4
20.2	62.68	150	43.6	4	12.78	17	63.1	1	18.41	46	73.8	6	49.51	32	60.8
30.2	61.26	142	42.6	10	12.63	15	62.7	4	17.99	42	72.7	11	49.22	29	59.7
May 10.2	59.95	131	41.2	14	12.51	12	62.2	5	17.61	38	71.2	15	48.97	25	58.2
20.1	58.78	117	39.3	19	12.43	8	61.6	6	17.28	33	69.2	20	48.76	21	56.3
30.1	57.77	101	37.0	23	12.40	3	60.9	7	17.01	27	66.8	24	48.60	16	54.0
June 9.1	56.95	82	34.4	26	12.41	1	60.2	7	16.82	19	64.1	27	48.49	11	51.3
19.0	56.33	62	31.5	29	12.47	6	59.4	8	16.69	13	61.1	30	48.43	6	48.5
29.0	55.94	39	28.5	30	12.58	11	58.6	8	16.64	5	57.9	32	48.43	0	45.4
July 9.0	55.78	16	25.3	32	12.73	15	57.8	8	16.67	3	54.7	32	48.49	6	42.3
19.0	55.85	7	22.1	32	12.92	19	57.1	7	16.78	11	51.4	33	48.60	11	39.2
28.9	56.15	30	19.0	31	13.14	22	56.3	8	16.96	18	48.3	31	48.77	17	36.2
Aug. 7.9	56.68	53	16.1	29	13.40	26	55.6	7	17.21	25	45.3	30	48.99	22	33.4
17.9	57.41	73	13.5	26	13.68	28	54.9	7	17.53	32	42.7	26	49.25	26	30.9
27.9	58.34	93	11.2	23	13.99	31	54.3	6	17.90	37	40.4	23	49.55	30	28.8
Sept. 6.8	59.43	109	9.4	18	14.32	33	53.7	6	18.33	43	38.7	17	49.89	34	27.1
16.8	60.64	121	8.2	12	14.66	34	53.1	6	18.79	46	37.5	12	50.26	37	26.0
26.8	61.95	131	7.5	7	15.01	35	52.5	6	19.28	49	36.9	6	50.65	39	25.5
Oct. 6.7	63.29	134	7.5	0	15.38	37	52.0	5	19.79	51	36.9	0	51.05	40	25.6
16.7	64.64	135	8.1	6	15.75	37	51.6	4	20.30	51	37.6	7	51.45	40	26.4
26.7	65.93	129	9.4	13	16.12	37	51.2	4	20.80	50	39.0	14	51.84	39	27.8
Nov. 5.7	67.12	119	11.3	19	16.48	36	50.9	3	21.27	47	41.0	20	52.22	38	29.8
15.6	68.17	105	13.7	24	16.82	34	50.7	2	21.70	43	43.5	25	52.57	35	32.3
25.6	69.03	86	16.5	28	17.15	33	50.6	1	22.07	37	46.5	30	52.88	31	35.2
Dec. 5.6	69.68	65	19.8	33	17.45	30	50.7	1	22.37	30	49.9	34	53.14	26	38.5
15.6	70.08	40	23.3	35	17.71	26	50.9	2	22.60	23	53.5	36	53.35	21	42.1
25.5	70.21	13	27.0	37	17.93	22	51.3	4	22.73	13	57.3	38	53.49	14	45.7
35.5	70.09	12	30.6	36	18.09	16	51.8	5	22.78	5	61.0	37	53.56	7	49.3
Sec δ, Tan δ	6.204		−6.123		1.207		+0.676		2.119		−1.869		1.572		−1.21
Mean Place	68^s.432		30″.15		11^s.329		53″.33		19^s.240		60″.16		49^s.608		47″.8
$\nu_\psi a$, $D_\omega a$	−0.16		−0.08		+0.02		+0.01		−0.05		−0.03		−0.03		−0.02
δ, $D_\omega \delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	15 Lyncis. Mag. 4.5				θ Canis Majoris. Mag. 4.2				ε Canis Majoris. Mag. 1.6				ζ Geminorum. Var. 3.7–4.3			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 6 49		° ′ +58 31		h m 6 50		° ′ −11 55		h m 6 55		° ′ −28 51		h m 6 59		° ′ +20 41	
	s		″		s		″		s		″		s		″	
an. 0.5	59.11		72.7		16.34		47.2		19.01		14.6		6.27		49.4	
10.5	59.28	17	74.7	20	16.44	10	49.4	22	19.09	8	17.6	30	6.40	13	49.2	2
20.5	59.36	8	76.7	20	16.48	4	51.4	20	19.12	3	20.4	28	6.48	8	49.1	1
30.4	59.36	0	78.7	20	16.47	1	53.2	18	19.09	3	23.0	26	6.50	2	49.0	1
eb. 9.4	59.26	10	80.6	19	16.42	5	54.8	16	19.01	8	25.3	23	6.47	3	49.1	1
19.4	59.09	17	82.3	17	16.33	9	56.1	13	18.89	12	27.2	19	6.40	7	49.2	1
ar. 1.3	58.85	24	83.7	14	16.20	13	57.1	10	18.73	16	28.7	15	6.29	11	49.4	2
11.3	58.56	29	84.8	11	16.05	15	57.8	7	18.55	18	29.9	12	6.15	14	49.6	2
21.3	58.24	32	85.5	7	15.88	17	58.2	4	18.34	21	30.6	7	5.99	16	49.8	2
31.3	57.90	34	85.8	3	15.70	18	58.3	1	18.13	21	31.0	4	5.82	17	49.9	1
pr. 10.2	57.57	33	85.7	1	15.52	18	58.2	1	17.92	21	30.9	1	5.65	17	50.0	1
20.2	57.26	31	85.2	5	15.36	16	57.8	4	17.72	20	30.4	5	5.49	16	50.1	1
30.2	56.99	27	84.3	9	15.22	14	57.1	7	17.54	18	29.6	8	5.35	14	50.1	0
ay 10.2	56.77	22	83.0	13	15.10	12	56.2	9	17.39	15	28.4	12	5.25	10	50.1	0
20.1	56.61	16	81.5	15	15.02	8	55.1	11	17.27	12	26.8	16	5.17	8	50.1	0
30.1	56.51	10	79.7	18	14.98	4	53.7	14	17.19	8	24.9	19	5.14	3	50.0	1
une 9.1	56.49	2	77.8	19	14.97	1	52.2	15	17.15	4	22.8	21	5.15	1	50.0	0
19.0	56.55	6	75.7	21	15.00	3	50.6	16	17.15	0	20.5	23	5.19	4	49.9	1
29.0	56.67	12	73.6	21	15.07	7	48.8	18	17.19	4	18.1	24	5.27	8	49.9	0
uly 9.0	56.86	19	71.5	21	15.17	10	47.0	18	17.27	8	15.6	25	5.40	13	49.8	1
19.0	57.12	26	69.4	21	15.30	13	45.2	18	17.39	12	13.1	25	5.56	16	49.8	0
28.9	57.44	32	67.4	20	15.47	17	43.5	17	17.55	16	10.7	24	5.74	18	49.8	0
ug. 7.9	57.81	37	65.6	18	15.67	20	41.9	16	17.74	19	8.4	23	5.96	22	49.7	1
17.9	58.23	42	63.8	18	15.89	22	40.5	14	17.96	22	6.4	20	6.21	25	49.5	2
27.9	58.68	45	62.3	15	16.13	24	39.4	11	18.21	25	4.7	17	6.47	26	49.3	2
Sept. 6.8	59.18	50	61.0	13	16.39	26	38.6	8	18.48	27	3.4	13	6.75	28	49.1	2
16.8	59.70	52	59.9	11	16.67	28	38.1	5	18.77	29	2.6	8	7.05	30	48.7	4
26.8	60.24	54	59.1	8	16.96	29	38.1	0	19.08	31	2.3	3	7.37	32	48.2	5
Oct. 6.7	60.79	55	58.5	6	17.26	30	38.4	3	19.39	31	2.5	2	7.69	32	47.7	5
16.7	61.35	56	58.2	3	17.56	30	39.1	7	19.71	32	3.2	7	8.02	33	47.0	7
26.7	61.90	55	58.2	0	17.86	30	40.3	12	20.03	32	4.5	13	8.35	33	46.3	7
Nov. 5.7	62.44	54	58.6	4	18.15	29	41.8	15	20.34	31	6.2	17	8.67	32	45.6	7
15.6	62.96	52	59.2	6	18.43	28	43.6	18	20.64	30	8.4	22	8.99	32	44.8	8
25.6	63.45	49	60.2	10	18.69	26	45.6	20	20.91	27	11.0	26	9.29	30	44.0	8
Dec. 5.6	63.88	43	61.4	12	18.93	24	47.8	22	21.15	24	13.8	28	9.57	28	43.3	7
15.6	64.26	38	63.0	16	19.13	20	50.1	23	21.36	21	16.8	30	9.81	24	42.7	6
25.5	64.57	31	64.7	17	19.30	17	52.4	23	21.52	16	19.8	30	10.02	21	42.2	5
35.5	64.79	22	66.6	19	19.42	12	54.7	23	21.63	11	22.9	31	10.18	16	41.9	3
ec δ, Tan δ	1.916		+1.634		1.022		−0.211		1.142		−0.551		1.069		+0.378	
ean Place	55ˢ.390		68″.08		14ˢ.472		52″.50		17ˢ.102		20″.52		4ˢ.127		45″.29	
$D'_\psi \alpha$, $D_\omega \alpha$	+0.04		+0.02		−0.01		0.00		−0.01		−0.01		+0.01		+0.01	
$D_\psi \delta$, $D_\omega \delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**o² Canis Majoris.** Mag. 3.1				**γ Canis Majoris.** Mag. 4.1				**δ Canis Majoris.** Mag. 2.0				**63 Aurigæ.** Mag. 5.1		
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.
	h m 6 59		° ′ −23 42		h m 6 59		° ′ −15 30		h m 7 4		° ′ −26 15		h m 7 5		° +39
	s		″		s		″		s		″		s		″
Jan. 0.5	30.39	9	24.3	27	56.65	10	19.5	24	57.94	9	21.2	29	51.33	16	40.3
10.5	30.48	4	27.0	26	56.75	5	21.9	22	58.03	4	24.1	28	51.49	10	41.2
20.5	30.52	2	29.6	24	56.80	0	24.1	20	58.07	1	26.9	25	51.59	4	42.2
30.4	30.50	6	32.0	21	56.80	5	26.1	18	58.06	6	29.4	22	51.63	3	43.2
Feb. 9.4	30.44	11	34.1	18	56.75	9	27.9	15	58.00	11	31.6	19	51.60	9	44.3
19.4	30.33	14	35.9	14	56.66	13	29.4	12	57.89	15	33.5	16	51.51	13	45.4
Mar. 1.4	30.19	17	37.3	11	56.53	15	30.6	8	57.74	17	35.1	12	51.38	17	46.3
11.3	30.02	19	38.4	7	56.38	17	31.4	6	57.57	19	36.3	8	51.21	20	47.0
21.3	29.83	20	39.1	3	56.21	19	32.0	2	57.38	21	37.1	4	51.01	21	47.6
31.3	29.63	19	39.4	0	56.02	18	32.2	1	57.17	20	37.5	0	50.80	21	47.9
Apr. 10.2	29.44	19	39.4	4	55.84	16	32.1	3	56.97	19	37.5	4	50.59	20	48.0
20.2	29.25	16	39.0	8	55.68	15	31.8	7	56.78	18	37.1	8	50.39	17	47.9
30.2	29.09	14	38.2	11	55.53	13	31.1	10	56.60	15	36.3	11	50.22	14	47.6
May 10.2	28.95	11	37.1	14	55.40	9	30.1	12	56.45	11	35.2	14	50.08	10	47.1
20.1	28.84	8	35.7	17	55.31	6	28.9	14	56.34	9	33.8	17	49.98	6	46.3
30.1	28.76	3	34.0	19	55.25	2	27.5	16	56.25	4	32.1	20	49.92	1	45.4
June 9.1	28.73	1	32.1	21	55.23	2	25.9	18	56.21	0	30.1	22	49.91	4	44.5
19.1	28.74	4	30.0	22	55.25	5	24.1	19	56.21	3	27.9	23	49.95	9	43.4
29.0	28.78	9	27.8	23	55.30	9	22.2	19	56.24	8	25.6	23	50.04	14	42.3
July 9.0	28.87	12	25.5	23	55.39	13	20.3	19	56.32	11	23.3	24	50.18	17	41.1
19.0	28.99	15	23.2	22	55.52	16	18.4	19	56.43	15	20.9	23	50.35	22	39.9
28.9	29.14	19	21.0	21	55.68	19	16.5	17	56.58	18	18.6	22	50.57	25	38.8
Aug. 7.9	29.33	21	18.9	19	55.87	21	14.8	15	56.76	21	16.4	19	50.82	29	37.7
17.9	29.54	24	17.0	15	56.08	23	13.3	13	56.97	24	14.5	16	51.11	31	36.6
27.9	29.78	26	15.5	11	56.31	26	12.0	9	57.21	26	12.9	13	51.42	33	35.6
Sept. 6.8	30.04	28	14.4	8	56.57	27	11.1	6	57.47	28	11.6	8	51.75	36	34.6
16.8	30.32	30	13.6	3	56.84	29	10.5	1	57.75	30	10.8	4	52.11	37	33.7
26.8	30.62	31	13.3	3	57.13	30	10.4	3	58.05	31	10.4	2	52.48	39	32.9
Oct. 6.8	30.93	31	13.6	7	57.43	31	10.7	7	58.36	32	10.6	7	52.87	39	32.2
16.7	31.24	31	14.3	12	57.74	30	11.4	12	58.68	32	11.3	12	53.26	39	31.6
26.7	31.55	31	15.5	17	58.04	30	12.6	15	59.00	31	12.5	17	53.65	40	31.1
Nov. 5.7	31.86	29	17.2	20	58.34	29	14.1	19	59.31	30	14.2	21	54.05	38	30.7
15.6	32.15	27	19.2	24	58.63	27	16.0	21	59.61	28	16.3	24	54.43	36	30.6
25.6	32.42	25	21.6	27	58.90	24	18.1	24	59.89	25	18.7	28	54.79	33	30.6
Dec. 5.6	32.67	21	24.3	28	59.14	21	20.5	25	60.14	21	21.5	29	55.12	30	30.8
15.6	32.88	16	27.1	29	59.35	18	23.0	25	60.35	17	24.4	29	55.42	25	31.2
25.5	33.04	12	30.0	28	59.53	12	25.5	25	60.52	13	27.3	30	55.67	19	31.8
35.5	33.16		32.8		59.65		28.0		60.65		30.3		55.86		32.6
Sec δ, Tan δ	1.092		−0.439		1.038		−0.277		1.115		−0.493		1.295		+0.823
Mean Place	28ˢ.510		30″.00		54ˢ.790		24″.90		56ˢ.055		27″.17		48ˢ.725		37″.06
D′ψ α, Dω α	−0.01		−0.01		−0.01		0.00		−0.01		−0.01		+0.02		+0.02
Dψ δ, Dω δ	−0.1		+1.0		−0.1		+1.0		−0.1		+1.0		−0.1		+1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	51 Geminorum. Mag. 5.3				γ² Volantis. Mag. 3.9				λ Geminorum. Mag. 3.6				25 H. Camelop. Mag. 5.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	7 8		+16 18		7 9		−70 21		7 13		+16 41		7 13		+82 34	
	s		″		s		″		s		″		s		″	
Jan. 0.5	31.59		18.7		31.79		31.6		14.64		44.0		30.54		45.2	
		14		6		0		38		15		5		57		30
10.5	31.73		18.1		31.79		35.4		14.79		43.5		31.11		48.2	
		8		4		14		37		9		4		22		30
20.5	31.81		17.7		31.65		39.1		14.88		43.1		31.33		51.2	
		4		3		26		35		3		3		13		29
30.4	31.85		17.4		31.39		42.6		14.91		42.8		31.20		54.1	
		2		2		37		32		1		2		46		28
Feb. 9.4	31.83		17.2		31.02		45.8		14.90		42.6		30.74		56.9	
		7		1		47		28		6		0		77		26
19.4	31.76		17.1		30.55		48.6		14.84		42.6		29.97		59.5	
		10		1		55		24		10		0		104		22
Mar. 1.4	31.66		17.2		30.00		51.0		14.74		42.6		28.93		61.7	
		13		0		62		19		13		1		126		17
11.3	31.53		17.2		29.38		52.9		14.61		42.7		27.67		63.4	
		16		1		66		14		16		2		142		12
21.3	31.37		17.3		28.72		54.3		14.45		42.9		26.25		64.6	
		16		2		69		9		16		1		151		6
31.3	31.21		17.5		28.03		55.2		14.29		43.0		24.74		65.2	
		17		1		69		3		17		1		153		0
Apr. 10.2	31.04		17.6		27.34		55.5		14.12		43.1		23.21		65.2	
		15		1		68		2		15		2		149		5
20.2	30.89		17.7		26.66		55.3		13.97		43.3		21.72		64.7	
		14		2		65		7		14		1		138		11
30.2	30.75		17.9		26.01		54.6		13.83		43.4		20.34		63.6	
		11		1		60		12		11		2		123		16
May 10.2	30.64		18.0		25.41		53.4		13.72		43.6		19.11		62.0	
		8		2		53		17		8		1		103		21
20.1	30.56		18.2		24.88		51.7		13.64		43.7		18.08		59.9	
		4		1		46		21		5		1		79		24
30.1	30.52		18.3		24.42		49.6		13.59		43.8		17.29		57.5	
		0		2		38		25		0		2		53		27
June 9.1	30.52		18.5		24.04		47.1		13.59		44.0		16.76		54.8	
		4		1		28		28		3		1		25		29
19.1	30.56		18.6		23.76		44.3		13.62		44.1		16.51		51.9	
		7		2		18		30		7		2		3		31
29.0	30.63		18.8		23.58		41.3		13.69		44.3		16.54		48.8	
		11		2		7		32		10		1		32		31
July 9.0	30.74		19.0		23.51		38.1		13.79		44.4		16.86		45.7	
		14		2		4		32		14		2		59		31
19.0	30.88		19.2		23.55		34.9		13.93		44.6		17.45		42.6	
		18		2		15		32		18		1		86		31
28.9	31.06		19.4		23.70		31.7		14.11		44.7		18.31		39.5	
		20		1		25		30		20		0		110		28
Aug. 7.9	31.26		19.5		23.95		28.7		14.31		44.7		19.41		36.7	
		23		0		36		28		22		0		133		27
17.9	31.49		19.5		24.31		25.9		14.53		44.7		20.74		34.0	
		25		0		44		25		25		1		152		24
27.9	31.74		19.5		24.75		23.4		14.78		44.6		22.26		31.6	
		27		2		53		20		27		2		170		21
Sept. 6.8	32.01		19.3		25.28		21.4		15.05		44.4		23.96		29.5	
		29		3		59		15		28		3		184		17
16.8	32.30		19.0		25.87		19.9		15.33		44.1		25.80		27.8	
		30		5		65		9		30		5		195		14
26.8	32.60		18.5		26.52		19.0		15.63		43.6		27.75		26.4	
		31		6		68		3		31		6		203		9
Oct. 6.8	32.91		17.9		27.20		18.7		15.94		43.0		29.78		25.5	
		32		7		69		4		32		8		206		5
16.7	33.23		17.2		27.89		19.1		16.26		42.2		31.84		25.0	
		33		8		68		11		33		8		206		0
26.7	33.56		16.4		28.57		20.2		16.59		41.4		33.90		25.0	
		32		9		65		17		32		10		202		5
Nov. 5.7	33.88		15.5		29.22		21.9		16.91		40.4		35.92		25.5	
		31		10		60		23		32		10		192		10
15.6	34.19		14.5		29.82		24.2		17.23		39.4		37.84		26.5	
		30		10		52		28		30		10		178		14
25.6	34.49		13.5		30.34		27.0		17.53		38.4		39.62		27.9	
		28		10		43		33		28		10		159		19
Dec. 5.6	34.77		12.5		30.77		30.3		17.81		37.4		41.21		29.8	
		24		9		32		35		25		9		135		23
15.6	35.01		11.6		31.09		33.8		18.06		36.5		42.56		32.1	
		21		8		21		37		21		8		108		26
25.5	35.22		10.8		31.30		37.5		18.27		35.7		43.64		34.7	
		16		7		7		39		17		7		77		28
35.5	35.38		10.1		31.37		41.4		18.44		35.0		44.41		37.5	
Sec δ, Tan δ	1.042		+0.292		2.975		−2.802		1.044		+0.300		7.743		+7.678	
Mean Place	$29^{s}.521$		$14''.88$		$28^{s}.283$		$39''.88$		$12^{s}.571$		$40''.50$		$16^{s}.654$		$42''.85$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.01		+0.01		−0.07		−0.06		+0.01		+0.01		+0.19		+0.16	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.1		+1.0		−0.1		+1.0		−0.1		+0.9		−0.1		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**π Argûs.** Mag. 2.7				**δ Geminorum.** Mag. 3.5				**δ Volantis.** Mag. 4.0				**ι Geminorum.** Mag. 3.9		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.
	h m 7 14		° ′ −36 56		h m 7 15		° ′ +22 8		h m 7 16		° ′ −67 47		h m 7 20		° +27 5
	s		″		s		″		s		″		s		″
Jan. 0.5	10.39		33.4		5.07		26.5		56.15		57.6		29.26		67.3
10.5	10.48	9	36.8	34	5.22	15	26.3	2	56.18	3	61.4	38	29.42	16	67.5
20.5	10.52	4	39.9	31	5.32	10	26.2	1	56.09	9	65.1	37	29.52	10	67.7
30.4	10.49	3	42.9	30	5.36	4	26.2	0	55.89	20	68.7	36	29.57	5	68.1
Feb. 9.4	10.41	8	45.6	27	5.35	1	26.4	2	55.59	30	71.9	32	29.57	0	68.6
19.4	10.28	13	47.9	23	5.29	6	26.6	2	55.20	39	74.8	29	29.51	6	69.1
Mar. 1.4	10.11	17	49.9	20	5.19	10	26.9	3	54.73	47	77.3	25	29.41	10	69.6
11.3	9.91	20	51.4	15	5.05	14	27.1	2	54.20	53	79.3	20	29.27	14	70.1
21.3	9.68	23	52.4	10	4.89	16	27.4	3	53.63	57	80.8	15	29.10	17	70.5
31.3	9.44	24	53.0	6	4.72	17	27.6	2	53.03	60	81.8	10	28.92	18	70.9
Apr. 10.3	9.20	24	53.2	2	4.55	17	27.8	2	52.43	60	82.2	4	28.74	18	71.1
20.2	8.97	23	52.9	3	4.39	16	27.9	1	51.84	59	82.1	1	28.57	17	71.2
30.2	8.76	21	52.2	7	4.25	14	28.0	1	51.27	57	81.5	6	28.42	15	71.1
May 10.2	8.57	19	51.0	12	4.14	11	28.0	0	50.74	53	80.4	11	28.30	12	71.0
20.1	8.42	15	49.5	15	4.05	9	27.9	1	50.27	47	78.8	16	28.21	9	70.7
30.1	8.30	12	47.6	19	4.01	4	27.8	1	49.86	41	76.7	21	28.15	6	70.4
June 9.1	8.22	8	45.4	22	4.00	1	27.7	1	49.53	33	74.3	24	28.14	1	70.0
19.1	8.18	4	43.0	24	4.03	3	27.5	2	49.28	25	71.6	27	28.16	2	69.5
29.0	8.19	1	40.4	26	4.10	7	27.4	1	49.12	16	68.6	30	28.23	7	69.0
July 9.0	8.24	5	37.7	27	4.21	11	27.2	2	49.06	6	65.5	31	28.34	11	68.5
19.0	8.34	10	35.0	27	4.35	14	27.0	2	49.09	3	62.2	33	28.48	14	68.0
29.0	8.47	13	32.3	27	4.52	17	26.8	2	49.22	13	59.0	32	28.66	18	67.4
Aug. 7.9	8.64	17	29.8	25	4.73	21	26.6	2	49.44	22	56.0	30	28.87	21	66.8
17.9	8.85	21	27.5	23	4.96	23	26.3	3	49.75	31	53.2	28	29.11	24	66.2
27.9	9.10	25	25.5	20	5.22	26	25.9	4	50.14	39	50.7	25	29.37	26	65.5
Sept. 6.8	9.37	27	24.0	15	5.50	28	25.5	4	50.60	46	48.6	21	29.66	29	64.8
16.8	9.67	30	22.9	11	5.79	29	25.0	5	51.13	53	47.1	15	29.96	30	64.1
26.8	9.99	32	22.3	6	6.10	31	24.4	6	51.71	58	46.1	10	30.28	32	63.4
Oct. 6.8	10.32	33	22.3	0	6.42	32	23.7	7	52.32	61	45.8	3	30.62	34	62.6
16.7	10.66	34	22.9	6	6.75	33	22.9	8	52.94	62	46.1	3	30.97	35	61.8
26.7	11.00	34	24.0	11	7.09	34	22.1	8	53.56	62	47.1	10	31.32	35	61.0
Nov. 5.7	11.34	34	25.8	18	7.42	33	21.3	8	54.16	60	48.7	16	31.67	35	60.2
15.7	11.66	32	28.0	22	7.75	33	20.4	9	54.72	56	51.0	23	32.01	34	59.5
25.6	11.96	30	30.6	26	8.06	31	19.6	8	55.21	49	53.7	27	32.34	33	58.9
Dec. 5.6	12.23	27	33.6	30	8.35	29	18.9	7	55.62	41	56.9	32	32.65	31	58.4
15.6	12.46	23	36.8	32	8.62	27	18.3	6	55.94	32	60.5	36	32.93	28	58.1
25.5	12.64	18	40.1	33	8.84	22	17.9	4	56.16	22	64.2	37	33.16	23	57.9
35.5	12.77	13	43.5	34	9.02	18	17.5	4	56.26	10	68.0	38	33.35	19	57.9
Sec δ, Tan δ	1.251		−0.752		1.080		+0.407		2.647		−2.451		1.132		+0.531
Mean Place	$8^{s}.442$		40″.18		$2^{s}.913$		23″.28		$52^{s}.998$		66″.13		$26^{s}.978$		64″.77
$D'_\psi a$, $D_\omega a$	−0.02		−0.02		+0.01		+0.01		−0.06		−0.05		+0.01		+0.01
$D_\psi \delta$, $D_\omega \delta$	−0.1		+0.9		−0.1		+0.9		−0.1		+0.9		−0.1		+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	η Canis Majoris. Mag. 2.4				Groombridge 1308. Mag. 5.8				β Canis Minoris. Mag. 3.1				ρ Geminorum. Mag. 4.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 7 20		° ′ −29 7		h m 7 22		° ′ +68 38		h m 7 22		° ′ + 8 27		h m 7 23		° ′ +31 57	
	s		″		s		″		s		″		s		″	
n. 0.5	45.89		65.4		8.20		28.3		34.50		44.8		41.16		19.1	
10.5	46.00	11	68.5	31	8.49	29	30.7	24	34.64	14	43.7	11	41.34	18	19.4	3
20.5	46.05	5	71.4	29	8.65	16	33.2	25	34.74	10	42.7	10	41.45	11	19.9	5
30.4	46.05	0	74.1	27	8.68	3	35.7	25	34.78	4	41.9	8	41.50	5	20.6	7
b. 9.4	46.00	5	76.6	25	8.59	9	38.1	24	34.77	1	41.3	6	41.50	0	21.3	7
19.4	45.90	10	78.7	21	8.38	21	40.4	23	34.72	5	40.8	5	41.44	6	22.0	7
ar. 1.4	45.76	14	80.5	18	8.07	31	42.4	20	34.63	9	40.5	3	41.34	10	22.7	7
11.3	45.58	18	81.8	13	7.68	39	44.0	16	34.50	13	40.4	1	41.19	15	23.4	7
21.3	45.39	19	82.8	10	7.22	46	45.1	11	34.35	15	40.3	1	41.02	17	23.9	5
·31.3	45.18	21	83.4	6	6.73	49	45.8	7	34.19	16	40.3	0	40.84	18	24.3	4
pr. 10.3	44.97	21	83.5	1	6.24	49	46.0	2	34.03	16	40.5	2	40.65	19	24.5	2
20.2	44.77	20	83.3	2	5.75	49	45.8	2	33.88	15	40.7	2	40.47	18	24.6	1
30.2	44.58	19	82.6	7	5.30	45	45.0	8	33.75	13	41.0	3	40.31	16	24.5	1
ay 10.2	44.42	16	81.6	10	4.90	40	43.8	12	33.63	12	41.3	3	40.18	13	24.3	2
20.1	44.29	13	80.3	13	4.58	32	42.2	16	33.55	8	41.7	4	40.08	10	23.9	4
30.1	44.19	10	78.6	17	4.34	24	40.3	19	33.50	5	42.2	5	40.02	6	23.4	5
ıne 9.1	44.13	6	76.6	20	4.20	14	38.1	22	33.48	2	42.7	5	40.00	2	22.8	6
19.1	44.11	2	74.5	21	4.16	4	35.7	24	33.50	2	43.3	6	40.03	3	22.2	6
29.0	44.12	1	72.2	23	4.21	5	33.1	26	33.56	6	43.9	6	40.09	6	21.5	7
ıly 9.0	44.18	6	69.7	25	4.36	15	30.5	26	33.65	9	44.5	6	40.20	11	20.7	8
19.0	44.27	9	67.3	24	4.61	25	27.8	27	33.77	12	45.1	6	40.35	15	19.9	8
29.0	44.40	13	64.9	24	4.95	34	25.2	26	33.92	15	45.6	5	40.53	18	19.1	8
ug. 7.9	44.57	17	62.6	23	5.37	42	22.6	26	34.10	18	46.1	5	40.74	21	18.3	8
17.9	44.77	20	60.6	20	5.87	50	20.3	23	34.31	21	46.5	4	40.99	25	17.5	8
27.9	45.00	23	58.8	18	6.44	57	18.1	22	34.54	23	46.7	2	41.26	27	16.6	9
ept. 6.8	45.25	25	57.4	14	7.07	63	16.1	20	34.79	25	46.8	1	41.55	29	15.8	8
16.8	45.53	28	56.5	9	7.75	68	14.4	17	35.06	27	46.6	2	41.87	32	14.9	9
26.8	45.83	30	56.0	5	8.47	72	13.0	14	35.35	29	46.3	3	42.20	33	14.1	8
ct. 6.8	46.14	31	56.1	1	9.22	75	12.0	10	35.65	30	45.7	6	42.55	35	13.2	9
16.7	46.46	32	56.7	6	9.99	77	11.3	7	35.96	31	44.9	8	42.91	36	12.4	8
26.7	46.79	33	57.8	11	10.77	78	11.0	3	36.27	31	43.9	10	43.27	36	11.6	8
lov. 5.7	47.11	32	59.4	16	11.54	77	11.0	0	36.58	31	42.8	11	43.63	36	10.9	7
15.7	47.42	31	61.5	21	12.28	74	11.5	5	36.89	31	41.5	13	43.99	36	10.3	6
25.6	47.71	29	64.0	25	12.98	70	12.5	10	37.19	30	40.1	14	44.34	35	9.9	4
Dec. 5.6	47.98	27	66.7	27	13.62	64	13.8	13	37.46	27	38.7	14	44.66	32	9.6	3
15.6	48.21	23	69.7	30	14.19	57	15.4	16	37.71	25	37.3	14	44.95	29	9.4	2
25.5	48.40	19	72.8	31	14.66	47	17.4	20	37.92	21	36.0	13	45.20	25	9.5	1
35.5	48.54	14	75.9	31	15.02	36	19.7	23	38.09	17	34.8	12	45.40	20	9.7	2
c δ, Tan δ	1.145		−0.557		2.746		+2.557		1.011		+0.149		1.179		+0.624	
an Place	44ˢ.023		71″.78		2ˢ.963		27″.05		32ˢ.538		41″.16		38ˢ.789		16″.89	
ψ α, Dψ α	−0.01		−0.01		+0.06		+0.06		0.00		0.00		+0.02		+0.01	
ψ δ, Dψ δ	−0.1		+0.9		−0.1		+0.9		−0.1		+0.9		−0.1		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**σ Argûs.** Mag. 3.3 Right Ascension.		Declination S.		**α² Geminorum.** (*Castor.*) Mag. 2.0 Right Ascension.		Declination N.		**25 Monocerotis.** Mag. 5.2 Right Ascension.		Declination S.		**α Canis Mino** (*Procyon.*) Mag. 0.5 Right Ascension.		Decli tion
	h m 7 26 s		° ′ −43 7 ″		h m 7 29 s		° ′ +32 4 ″		h m 7 33 s		° ′ − 3 55 ″		h m 7 34 s		° + 5 ″
Jan. 0.5	33.99	10	36.1	36	13.11	18	36.2	3	4.95	14	8.9	19	53.05	15	39.7
10.5	34.09	4	39.7	34	13.29	12	36.5	5	5.09	10	10.8	17	53.20	10	38.3
20.5	34.13	2	43.1	32	13.41	6	37.0	7	5.19	4	12.5	15	53.30	5	37.1
30.5	34.11	9	46.3	30	13.47	0	37.7	7	5.23	1	14.0	13	53.35	1	36.1
Feb. 9.4	34.02	14	49.3	25	13.47	6	38.4	7	5.22	5	15.3	11	53.34	4	35.3
19.4	33.88	18	51.8	22	13.41	10	39.1	8	5.17	9	16.4	9	53.30	9	34.7
Mar. 1.4	33.70	23	54.0	18	13.31	14	39.9	6	5.08	12	17.3	6	53.21	12	34.
11.3	33.47	25	55.8	13	13.17	17	40.5	6	4.96	15	17.9	4	53.09	15	33.9
21.3	33.22	26	57.1	9	13.00	18	41.1	4	4.81	16	18.3	2	52.94	15	33.7
31.3	32.96	27	58.0	3	12.82	18	41.5	3	4.65	16	18.5	0	52.79	16	33.7
Apr. 10.3	32.69	26	58.3	1	12.64	18	41.8	1	4.49	16	18.5	2	52.63	16	33.
20.2	32.43	25	58.2	6	12.46	17	41.9	1	4.33	14	18.3	4	52.47	14	34.
30.2	32.18	22	57.6	11	12.29	14	41.8	2	4.19	12	17.9	6	52.33	11	34.3
May 10.2	31.96	19	56.5	15	12.15	10	41.6	3	4.07	10	17.3	7	52.22	9	34.
20.2	31.77	16	55.0	18	12.05	6	41.3	5	3.97	6	16.6	9	52.13	6	35.
30.1	31.61	11	53.2	22	11.99	3	40.8	6	3.91	3	15.7	11	52.07	3	35.
June 9.1	31.50	7	51.0	25	11.96	2	40.2	7	3.88	0	14.6	11	52.04	1	36.
19.1	31.43	2	48.5	27	11.98	6	39.5	7	3.88	4	13.5	12	52.05	4	37.
29.0	31.41	2	45.8	28	12.04	10	38.8	8	3.92	7	12.3	13	52.09	8	37.
July 9.0	31.43	8	43.0	29	12.14	13	38.0	8	3.99	10	11.0	12	52.17	12	38.
19.0	31.51	12	40.1	28	12.27	18	37.2	8	4.09	14	9.8	12	52.29	14	39.
29.0	31.63	16	37.3	27	12.45	21	36.4	9	4.23	16	8.6	11	52.43	17	39.
Aug. 7.9	31.79	20	34.6	25	12.66	24	35.5	9	4.39	19	7.5	10	52.60	19	40.
17.9	31.99	24	32.1	22	12.90	26	34.6	9	4.58	21	6.5	8	52.79	22	40.
27.9	32.23	28	29.9	18	13.16	29	33.7	9	4.79	24	5.7	5	53.01	24	41.
Sept. 6.9	32.51	31	28.1	13	13.45	31	32.8	9	5.03	26	5.2	2	53.25	26	41.
16.8	32.82	33	26.8	8	13.76	33	31.9	9	5.29	27	5.0	0	53.51	28	41.
26.8	33.15	35	26.0	1	14.09	35	31.0	9	5.56	29	5.0	4	53.79	29	40.
Oct. 6.8	33.50	37	25.9	4	14.44	36	30.1	9	5.85	30	5.4	8	54.08	31	40.
16.7	33.87	37	26.3	10	14.80	36	29.2	8	6.15	30	6.2	10	54.39	31	39.
26.7	34.24	36	27.3	16	15.16	37	28.4	8	6.45	31	7.2	14	54.70	31	38.
Nov. 5.7	34.60	35	28.9	22	15.53	36	27.6	7	6.76	31	8.6	16	55.01	30	36.
15.7	34.95	33	31.1	27	15.89	35	26.9	5	7.07	29	10.2	18	55.31	30	35.
25.6	35.28	29	33.8	30	16.24	32	26.4	3	7.36	27	12.0	20	55.61	28	33.
Dec. 5.6	35.57	25	36.8	33	16.56	30	26.1	2	7.63	24	14.0	20	55.89	25	32.
15.6	35.82	19	40.1	35	16.86	25	25.9	0	7.87	21	16.0	20	56.14	21	30.7
25.6	36.01	14	43.6	36	17.11	21	25.9	2	8.08	17	18.0	20	56.35	18	29.1
35.5	36.15		47.2		17.32		26.1		8.25		20.0		56.53		27.7
Sec δ, Tan δ	1.370		−0.937		1.180		+0.627		1.002		−0.069		1.005		+0.0
Mean Place	31ˢ.996		43″.66		10ˢ.736		34″.45		3ˢ.100		13″.16		51ˢ.192		36″.5
D′ψ α, Dω α	−0.02		−0.02		+0.02		+0.02		0.00		0.00		0.00		0.0
Dψ δ, Dω δ	−0.1		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2		+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	24 Lyncis. Mag. 5.0				κ Geminorum. Mag. 3.7				β Geminorum. (*Pollux.*) Mag. 1.2				4 Puppis. Mag. 5.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	7 35		+58 54		7 39		+24 36		7 40		+28 13		7 42		−14 21	
	s		″		s		″		s		″		s		″	
n. 0.5	53.19	26	37.9	18	21.31	18	11.2	1	9.29	18	57.9	1	3.83	14	18.2	24
10.5	53.45	16	39.7	20	21.49	12	11.1	0	9.47	13	58.0	2	3.97	9	20.6	24
20.5	53.61	8	41.7	21	21.61	7	11.1	1	9.60	7	58.2	4	4.06	5	23.0	21
30.5	53.69	2	43.8	21	21.68	1	11.2	3	9.67	1	58.6	5	4.11	1	25.1	19
eb. 9.4	53.67	11	45.9	20	21.69	4	11.5	4	9.68	5	59.1	6	4.10	6	27.0	16
19.4	53.56	18	47.9	18	21.65	8	11.9	4	9.63	8	59.7	6	4.04	9	28.6	13
ar. 1.4	53.38	25	49.7	15	21.57	12	12.3	4	9.55	13	60.3	5	3.95	13	29.9	11
11.4	53.13	30	51.2	12	21.45	15	12.7	5	9.42	16	60.8	6	3.82	15	31.0	7
21.3	52.83	32	52.4	8	21.30	17	13.2	3	9.26	17	61.4	4	3.67	17	31.7	5
31.3	52.51	34	53.2	4	21.13	17	13.5	3	9.09	18	61.8	3	3.50	17	32.2	1
pr. 10.3	52.17	32	53.6	0	20.96	17	13.8	2	8.91	17	62.1	2	3.33	17	32.3	1
20.2	51.85	31	53.6	5	20.79	15	14.0	1	8.74	16	62.3	1	3.16	15	32.2	4
30.2	51.54	27	53.1	8	20.64	12	14.1	0	8.58	13	62.4	1	3.01	14	31.8	7
ay 10.2	51.27	21	52.3	12	20.52	10	14.1	0	8.45	11	62.3	2	2.87	11	31.1	10
20.2	51.06	17	51.1	15	20.42	7	14.1	2	8.34	7	62.1	3	2.76	8	30.1	11
30.1	50.89	9	49.6	17	20.35	3	13.9	2	8.27	3	61.8	4	2.68	5	29.0	14
une 9.1	50.80	3	47.9	20	20.32	1	13.7	3	8.24	1	61.4	4	2.63	1	27.6	15
19.1	50.77	4	45.9	21	20.33	5	13.4	3	8.25	4	61.0	6	2.62	2	26.1	17
29.1	50.81	11	43.8	23	20.38	9	13.1	4	8.29	8	60.4	5	2.64	5	24.4	17
uly 9.0	50.92	18	41.5	22	20.47	12	12.7	4	8.37	13	59.9	6	2.69	9	22.7	18
19.0	51.10	24	39.3	23	20.59	15	12.3	4	8.50	15	59.3	7	2.78	12	20.9	17
29.0	51.34	29	37.0	23	20.74	19	11.9	5	8.65	19	58.6	7	2.90	15	19.2	16
ug. 7.9	51.63	35	34.7	21	20.93	21	11.4	6	8.84	22	57.9	8	3.05	17	17.6	15
17.9	51.98	40	32.6	20	21.14	24	10.8	6	9.06	25	57.1	8	3.22	21	16.1	12
27.9	52.38	44	30.6	19	21.38	27	10.2	7	9.31	27	56.3	8	3.43	23	14.9	9
ept. 6.9	52.82	48	28.7	17	21.65	28	9.5	7	9.58	29	55.5	9	3.66	25	14.0	6
16.8	53.30	51	27.0	15	21.93	30	8.8	9	9.87	31	54.6	9	3.91	27	13.4	2
26.8	53.81	53	25.5	12	22.23	32	7.9	9	10.18	33	53.7	9	4.18	29	13.2	2
ct. 6.8	54.34	56	24.3	10	22.55	34	7.0	9	10.51	35	52.8	10	4.47	30	13.4	6
16.8	54.90	56	23.3	6	22.89	34	6.1	10	10.86	35	51.8	10	4.77	31	14.0	11
26.7	55.46	57	22.7	3	23.23	34	5.1	10	11.21	35	50.8	9	5.08	31	15.1	14
ov. 5.7	56.03	55	22.4	0	23.57	35	4.1	9	11.56	35	49.9	9	5.39	31	16.5	18
15.7	56.58	53	22.4	4	23.92	33	3.2	9	11.91	34	49.0	7	5.70	30	18.3	21
25.6	57.11	50	22.8	8	24.25	31	2.3	8	12.25	33	48.3	6	6.00	27	20.4	23
ec. 5.6	57.61	44	23.6	11	24.56	29	1.5	6	12.58	29	47.7	5	6.27	25	22.7	25
15.6	58.05	38	24.7	14	24.85	25	0.9	5	12.87	25	47.2	2	6.52	21	25.2	26
25.6	58.43	31	26.1	17	25.10	20	0.4	3	13.12	21	47.0	1	6.73	17	27.8	25
35.5	58.74		27.8		25.30		0.1		13.33		46.9		6.90		30.3	
c δ, Tan δ	1.937		+1.658		1.100		+0.458		1.135		+0.537		1.032		−0.256	
an Place	49s.392		37″.89		19s.122		9″.66		7s.018		56″.71		2s.035		23″.32	
ϕa, Dω a	+0.04		+0.04		+0.01		+0.01		+0.01		+0.02		−0.01		−0.01	
ϕδ, Dω δ	−0.2		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ξ Argûs. Mag. 3.5				φ Geminorum. Mag. 5.0				26 Lyncis. Mag. 5.7				Groombridge Mag. 5.6		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		De
	h m 7 45 s		° ′ −24 38 ″		h m 7 48 s		° ′ +26 59 ″		h m 7 48 s		° ′ +47 46 ″		h m 7 50 s		+7
Jan. 0.5	44.95		38.5		20.11		13.2		34.73		68.9		9.63		46
10.5	45.09	14	41.4	29	20.30	19	13.2	0	34.97	24	70.1	12	10.08	45	48
20.5	45.18	9	44.2	28	20.44	14	13.3	1	35.13	16	71.5	14	10.36	28	51
30.5	45.21	3	46.9	27	20.51	7	13.6	3	35.22	9	73.0	15	10.47	11	54
Feb. 9.4	45.19	2	49.3	24	20.54	3	14.0	4	35.24	2	74.6	16	10.42	5	56
19.4	45.13	6	51.4	21	20.51	3	14.6	6	35.18	6	76.2	16	10.20	22	59
Mar. 1.4	45.02	11	53.2	18	20.43	8	15.1	5	35.07	11	77.6	14	9.84	36	61
11.4	44.88	14	54.6	14	20.31	12	15.7	6	34.90	17	78.9	13	9.35	49	63
21.3	44.71	17	55.6	10	20.16	15	16.2	5	34.69	21	80.0	11	8.77	58	65
31.3	44.52	19	56.3	7	20.00	16	16.7	5	34.46	23	80.8	8	8.12	65	66
Apr. 10.3	44.33	19	56.6	3	19.82	18	17.0	3	34.22	24	81.3	5	7.44	68	66
20.2	44.14	19	56.6	0	19.65	17	17.2	2	33.98	24	81.5	2	6.76	68	66
30.2	43.97	17	56.2	4	19.50	15	17.3	1	33.76	22	81.4	1	6.11	65	66
May 10.2	43.81	16	55.4	8	19.36	14	17.4	1	33.56	20	80.9	5	5.52	59	65
20.2	43.68	13	54.3	11	19.25	11	17.2	2	33.40	16	80.2	7	5.00	52	63
30.1	43.58	10	52.9	14	19.18	7	17.0	2	33.28	12	79.1	11	4.58	42	62
June 9.1	43.51	7	51.3	16	19.14	4	16.7	3	33.21	7	77.9	12	4.27	31	59
19.1	43.47	4	49.4	19	19.14	0	16.3	4	33.19	2	76.5	14	4.09	18	57
29.1	43.47	0	47.4	20	19.18	4	15.8	5	33.23	4	75.0	15	4.04	5	54
July 9.0	43.51	4	45.2	22	19.26	8	15.3	5	33.31	8	73.3	17	4.11	7	51
19.0	43.59	8	43.0	22	19.37	11	14.8	5	33.44	13	71.5	18	4.31	20	48
29.0	43.70	11	40.8	22	19.52	15	14.2	6	33.62	18	69.7	18	4.63	32	45
Aug. 7.9	43.84	14	38.7	21	19.70	18	13.5	7	33.85	23	67.9	18	5.08	45	42
17.9	44.01	17	36.8	19	19.91	21	12.7	8	34.11	26	66.2	17	5.63	55	40
27.9	44.22	21	35.2	16	20.15	24	12.0	7	34.41	30	64.5	17	6.28	65	37
Sept. 6.9	44.45	23	33.9	13	20.41	26	11.1	9	34.75	34	62.8	17	7.03	75	35
16.8	44.70	25	32.9	10	20.70	29	10.2	9	35.12	37	61.2	16	7.85	82	32
26.8	44.98	28	32.5	4	21.00	30	9.3	9	35.51	39	59.8	14	8.74	89	31
Oct. 6.8	45.28	30	32.5	0	21.32	32	8.3	10	35.93	42	58.5	13	9.68	94	29
16.8	45.59	31	33.0	5	21.66	34	7.2	11	36.36	43	57.4	11	10.66	98	28
26.7	45.91	32	34.0	10	22.01	35	6.2	10	36.81	45	56.5	9	11.67	101	27
Nov. 5.7	46.24	33	35.5	15	22.36	35	5.2	10	37.26	45	55.8	7	12.67	100	27
15.7	46.55	31	37.4	19	22.71	35	4.2	10	37.71	45	55.4	4	13.66	99	27
25.6	46.86	31	39.7	23	23.05	34	3.4	8	38.14	43	55.2	2	14.61	95	28
Dec. 5.6	47.14	28	42.3	26	23.38	33	2.6	8	38.55	41	55.4	2	15.48	87	29
15.6	47.39	25	45.1	28	23.68	30	2.1	5	38.93	38	55.9	5	16.27	79	31
25.6	47.61	22	48.1	30	23.94	26	1.7	4	39.26	33	56.6	7	16.94	67	33
35.5	47.78	17	51.0	29	24.15	21	1.5	2	39.53	27	57.7	11	17.47	53	35
Sec δ, Tan δ	1.100		−0.459		1.122		+0.509		1.488		+1.102		3.660		+3.5
Mean Place	43ˢ.165		44″.72		17ˢ.882		12″.46		31ˢ.771		69″.69		2ˢ.805		48″.
$D'_\psi a$, $D_\omega a$	−0.01		−0.01		+0.01		+0.02		+0.03		+0.03		+0.08		+0.
$_\psi \delta$, $D_\omega \delta$	−0.2		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2		+0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**χ Argûs.** Mag. 3.6				**ω Cancri.** Mag. 5.9				**χ Geminorum.** Mag. 5.0				**27 Lyncis.** Mag. 4.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	7 54		−52 44		7 55		+25 37		7 58		+28 1		8 2		+51 44	
	s		″		s		″		s		″		s		″	
Jan. 0.6	39.18		65.4		49.60		35.3		20.30		60.5		7.52		67.9	
10.5	39.32	14	69.1	37	49.79	19	35.1	2	20.50	20	60.5	0	7.78	26	69.3	14
20.5	39.38	6	72.9	38	49.93	14	35.1	0	20.65	15	60.7	2	7.97	19	70.8	15
30.5	39.36	2	76.5	36	50.02	9	35.3	2	20.74	9	61.0	3	8.09	12	72.5	17
Feb. 9.4	39.28	8	79.8	33	50.05	3	35.7	4	20.77	3	61.5	5	8.12	3	74.3	18
19.4	39.13	15	82.9	31	50.02	3	36.1	4	20.75	2	62.1	6	8.08	4	76.1	18
Mar. 1.4	38.92	21	85.6	27	49.95	7	36.6	5	20.68	7	62.7	6	7.96	12	77.8	17
11.4	38.66	26	87.9	23	49.84	11	37.2	6	20.56	12	63.3	6	7.79	17	79.3	15
21.3	38.37	29	89.7	18	49.70	14	37.7	5	20.42	14	63.9	6	7.58	21	80.6	13
31.3	38.05	32	91.0	13	49.54	16	38.2	5	20.26	16	64.5	6	7.33	25	81.6	10
Apr. 10.3	37.72	33	91.8	8	49.37	17	38.5	3	20.08	18	64.9	4	7.06	27	82.3	7
20.3	37.39	33	92.2	4	49.20	17	38.8	3	19.91	17	65.2	3	6.80	26	82.6	3
30.2	37.07	32	92.0	2	49.05	15	39.0	2	19.75	16	65.3	1	6.55	25	82.5	1
May 10.2	36.77	30	91.3	7	48.91	14	39.0	0	19.61	14	65.3	0	6.32	23	82.1	4
20.2	36.50	27	90.1	12	48.80	11	39.0	0	19.50	11	65.2	1	6.13	19	81.3	8
30.1	36.26	24	88.5	16	48.72	8	38.8	2	19.42	8	65.0	2	5.98	15	80.3	10
June 9.1	36.07	19	86.5	20	48.68	4	38.6	2	19.37	5	64.7	3	5.88	10	78.9	14
19.1	35.92	15	84.1	24	48.68	0	38.3	3	19.36	1	64.2	5	5.84	4	77.4	15
29.1	35.83	9	81.5	26	48.71	3	37.9	4	19.39	3	63.7	5	5.85	1	75.6	18
July 9.0	35.79	4	78.6	29	48.78	7	37.4	5	19.46	7	63.1	6	5.91	6	73.8	18
19.0	35.81	2	75.7	29	48.88	10	36.9	5	19.57	11	62.5	6	6.03	12	71.8	20
29.0	35.88	7	72.7	30	49.02	14	36.4	5	19.71	14	61.8	7	6.20	17	69.8	20
Aug. 8.0	36.01	13	69.7	30	49.19	17	35.8	6	19.87	16	61.0	8	6.42	22	67.7	21
17.9	36.19	18	66.9	28	49.39	20	35.1	7	20.08	21	60.1	9	6.68	26	65.7	20
27.9	36.43	24	64.4	25	49.62	23	34.3	8	20.31	23	59.3	8	6.99	31	63.7	20
Sept. 6.9	36.71	28	62.3	21	49.87	25	33.5	8	20.56	25	58.3	10	7.33	34	61.7	20
16.8	37.04	33	60.6	17	50.15	28	32.6	9	20.84	28	57.3	10	7.71	38	59.9	18
26.8	37.40	36	59.4	12	50.45	30	31.6	10	21.14	30	56.2	11	8.12	41	58.2	17
Oct. 6.8	37.80	40	58.8	6	50.76	31	30.6	10	21.46	32	55.1	11	8.56	44	56.7	15
16.8	38.22	42	58.9	1	51.09	33	29.5	11	21.80	34	54.0	11	9.02	46	55.4	13
26.7	38.65	43	59.6	7	51.44	35	28.4	11	22.15	35	52.9	11	9.50	48	54.4	10
Nov. 5.7	39.08	43	60.9	13	51.79	35	27.3	11	22.51	36	51.8	11	9.98	48	53.6	8
15.7	39.50	42	62.8	19	52.14	35	26.2	11	22.87	36	50.8	10	10.46	48	53.1	5
25.7	39.89	39	65.3	25	52.48	34	25.2	10	23.22	35	49.9	9	10.93	47	52.9	2
Dec. 5.6	40.24	35	68.3	30	52.81	33	24.4	8	23.55	33	49.1	8	11.38	45	53.1	2
15.6	40.55	31	71.6	33	53.11	30	23.7	7	23.86	31	48.5	6	11.80	42	53.6	5
25.6	40.80	25	75.2	36	53.37	26	23.2	5	24.13	27	48.1	4	12.16	36	54.5	9
35.5	40.98	18	79.0	38	53.59	22	22.9	3	24.36	23	47.9	2	12.47	31	55.6	11
ec δ, Tan δ	1.652		−1.315		1.109		+0.480		1.133		+0.532		1.615		+1.269	
ean Place	37ˢ.092		74″.71		47ˢ.407		34″.86		18ˢ.059		60″.52		4ˢ.338		70″.18	
$V_\phi\alpha$, $D_\omega\alpha$	−0.03		−0.04		+0.01		+0.02		+0.01		+0.02		+0.03		+0.04	
$\psi\delta$, $D_\omega\delta$	−0.2		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2		+0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ρ Argûs.** Mag. 2.9				**8 H. Ursæ Majoris.** Mag. 5.5				**γ Argûs.** Mag. 2.2				**ζ Cancri (*mean*** Mag. 4.7		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declin- tion N
	h m 8 3		° ′ −24 3		h m 8 4		° ′ +68 43		h m 8 6		° ′ −47 4		h m 8 7		° +17
	s		″		s		″		s		″		s		″
Jan. 0.6	57.16		24.4		27.43		29.3		56.75		59.5		22.38		18.7
10.5	57.32	16	27.3	29	27.82	39	31.5	22	56.91	16	63.2	37	22.57	19	18.0
20.5	57.43	11	30.2	29	28.09	27	33.9	24	57.00	9	66.8	36	22.72	15	17.5
30.5	57.48	5	32.9	27	28.24	15	36.4	25	57.02	2	70.3	35	22.81	9	17.2
Feb. 9.5	57.49	1	35.3	24	28.25	1	38.9	25	56.98	4	73.7	34	22.85	4	17.1
19.4	57.44	5	37.5	22	28.14	11	41.4	25	56.87	11	76.7	30	22.84	1	17.1
Mar. 1.4	57.35	9	39.4	19	27.91	23	43.6	22	56.71	16	79.4	27	22.78	6	17.2
11.4	57.22	13	40.9	15	27.58	33	45.6	20	56.51	20	81.6	22	22.68	10	17.5
21.3	57.06	16	42.0	11	27.18	40	47.3	17	56.27	24	83.5	19	22.56	12	17.8
31.3	56.89	17	42.8	8	26.73	45	48.5	12	56.00	27	84.9	14	22.41	15	18.1
Apr. 10.3	56.70	19	43.3	5	26.24	49	49.2	7	55.72	28	85.7	8	22.25	16	18.4
20.3	56.52	18	43.4	1	25.74	50	49.5	3	55.44	28	86.1	4	22.10	15	18.7
30.2	56.35	17	43.1	3	25.26	48	49.2	3	55.17	27	86.0	1	21.95	15	18.9
May 10.2	56.19	16	42.4	7	24.82	44	48.5	7	54.92	25	85.5	5	21.82	13	19.2
20.2	56.05	14	41.5	9	24.43	39	47.3	12	54.68	24	84.5	10	21.71	11	19.3
30.2	55.94	11	40.2	13	24.12	31	45.7	16	54.48	20	83.0	15	21.63	8	19.5
June 9.1	55.86	8	38.7	15	23.88	24	43.8	19	54.32	16	81.1	19	21.59	4	19.6
19.1	55.81	5	37.0	17	23.73	15	41.5	23	54.20	12	78.9	22	21.58	1	19.6
29.1	55.80	1	35.0	20	23.68	5	39.1	24	54.12	8	76.5	24	21.60	2	19.7
July 9.0	55.82	2	33.0	20	23.72	4	36.4	27	54.09	3	73.8	27	21.65	5	19.6
19.0	55.88	6	30.9	21	23.86	14	33.6	28	54.10	1	70.9	29	21.74	9	19.6
29.0	55.97	9	28.8	21	24.08	22	30.8	28	54.17	7	68.1	28	21.86	12	19.4
Aug. 8.0	56.09	12	26.7	21	24.40	32	28.0	28	54.28	11	65.3	28	22.01	15	19.2
17.9	56.25	16	24.8	19	24.80	40	25.3	27	54.44	16	62.6	27	22.19	18	18.9
27.9	56.44	19	23.2	16	25.27	47	22.7	26	54.65	21	60.2	24	22.39	20	18.5
Sept. 6.9	56.66	22	21.9	13	25.81	54	20.2	25	54.90	25	58.1	21	22.62	23	17.9
16.9	56.90	24	20.9	10	26.42	61	18.0	22	55.19	29	56.4	17	22.87	25	17.2
26.8	57.17	27	20.4	5	27.08	66	16.0	20	55.51	32	55.3	11	23.15	28	16.4
Oct. 6.8	57.46	29	20.3	1	27.79	71	14.3	17	55.87	36	54.7	6	23.45	30	15.4
16.8	57.77	31	20.7	4	28.53	74	12.9	14	56.25	38	54.7	0	23.76	31	14.3
26.7	58.09	32	21.6	9	29.30	77	12.0	9	56.64	39	55.3	6	24.09	33	13.2
Nov. 5.7	58.41	32	23.1	15	30.07	77	11.4	6	57.04	40	56.6	13	24.42	33	11.9
15.7	58.74	33	24.9	18	30.84	77	11.3	1	57.43	39	58.4	18	24.75	33	10.6
25.7	59.05	31	27.1	22	31.59	75	11.6	3	57.80	37	60.8	24	25.08	33	9.3
Dec. 5.6	59.34	29	29.7	26	32.30	71	12.4	8	58.15	35	63.7	29	25.40	32	8.1
15.6	59.61	27	32.5	28	32.94	64	13.6	12	58.45	30	66.9	32	25.69	29	7.0
25.6	59.84	23	35.4	29	33.49	55	15.2	16	58.71	26	70.4	35	25.95	26	6.0
35.5	60.03	19	38.4	30	33.95	46	17.1	19	58.90	19	74.0	36	26.17	22	5.2
Sec δ, Tan δ	1.095		−0.446		2.756		+2.568		1.469		−1.076		1.051		+0.3
Mean Place	$55^{s}.427$		$30''.65$		$22^{s}.221$		$32''.57$		$54^{s}.847$		$68''.66$		$20^{s}.353$		$18''.1$
$D'_\psi\,\alpha$, $D_\omega\,\alpha$	−0.01		−0.02		+0.06		+0.09		−0.02		−0.04		+0.01		+0.0
$_\psi\,\delta$, $D_\omega\,\delta$	−0.2		+0.9		−0.2		+0.9		−0.2		+0.9		−0.2		+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**Bradley 1147.** Mag. 5.7				**20 Puppis.** Mag. 5.0				**β Cancri.** Mag. 3.8				**31 Lyncis.** Mag. 4.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 8 8		° ′ +76 0		h m 8 9		° ′ −15 31		h m 8 11		° ′ + 9 26		h m 8 17		° ′ +43 27	
	s		″		s		″		s		″		s		″	
n. 0.6	61.44		60.7		27.28		48.0		56.30		55.3		4.12		39.5	
10.5	62.00	56	63.1	24	27.45	17	50.6	26	56.49	19	54.1	12	4.37	25	40.3	8
20.5	62.37	37	65.7	26	27.57	12	53.1	25	56.63	14	53.1	10	4.57	20	41.3	10
30.5	62.56	19	68.5	28	27.64	7	55.4	23	56.72	9	52.2	9	4.69	12	42.5	12
eb. 9.5	62.56	0	71.3	28	27.66	2	57.4	20	56.76	4	51.6	6	4.74	5	43.9	14
19.4	62.37	19	74.0	27	27.63	3	59.2	18	56.75	1	51.1	5	4.73	1	45.3	14
ar. 1.4	62.01	36	76.5	25	27.55	8	60.7	15	56.70	5	50.8	3	4.66	7	46.7	14
11.4	61.50	51	78.7	22	27.45	10	62.0	13	56.61	9	50.7	1	4.54	12	48.1	14
21.3	60.88	62	80.5	18	27.31	14	62.9	9	56.48	13	50.7	0	4.37	17	49.2	11
31.3	60.17	71	81.8	13	27.15	16	63.5	6	56.34	14	50.8	1	4.17	20	50.2	10
pr. 10.3	59.41	76	82.6	8	26.99	16	63.8	3	56.19	15	51.0	2	3.96	21	50.9	7
20.3	58.63	78	82.8	2	26.82	17	63.8	0	56.04	15	51.2	2	3.74	22	51.4	5
30.2	57.87	76	82.5	3	26.66	16	63.5	3	55.90	14	51.5	3	3.54	20	51.6	2
ay 10.2	57.16	71	81.7	8	26.52	14	62.9	6	55.77	13	51.8	3	3.35	19	51.4	2
20.2	56.53	63	80.4	13	26.40	12	62.1	8	55.67	10	52.2	4	3.19	16	51.0	4
30.2	55.99	54	78.6	18	26.30	10	61.1	10	55.59	8	52.6	4	3.06	13	50.3	7
ne 9.1	55.57	42	76.5	21	26.24	6	59.8	13	55.54	5	53.1	5	2.97	9	49.4	9
19.1	55.29	28	74.0	25	26.20	4	58.4	14	55.52	2	53.5	4	2.93	4	48.3	11
29.1	55.14	15	71.3	27	26.19	1	56.8	16	55.54	2	54.0	5	2.93	0	47.0	13
ly 9.0	55.14	0	68.4	29	26.23	4	55.1	17	55.58	4	54.4	4	2.98	5	45.6	14
19.0	55.27	13	65.4	30	26.29	6	53.4	17	55.66	8	54.8	4	3.07	9	44.0	16
29.0	55.55	28	62.3	31	26.38	9	51.7	17	55.77	11	55.1	3	3.21	14	42.4	16
ug. 8.0	55.96	41	59.2	31	26.50	12	50.0	17	55.91	14	55.4	3	3.38	17	40.6	18
17.9	56.51	55	56.2	30	26.65	15	48.6	14	56.07	16	55.6	2	3.59	21	38.9	17
27.9	57.17	66	53.3	29	26.84	19	47.3	13	56.26	19	55.5	1	3.84	25	37.2	17
pt. 6.9	57.94	77	50.7	26	27.05	21	46.3	10	56.48	22	55.4	1	4.13	29	35.4	18
16.9	58.80	86	48.2	25	27.28	23	45.6	7	56.72	24	55.0	4	4.44	31	33.7	17
26.8	59.75	95	46.1	21	27.54	26	45.3	3	56.98	26	54.5	5	4.78	34	32.1	16
ct. 6.8	60.78	103	44.3	18	27.82	28	45.5	2	57.27	29	53.7	8	5.16	38	30.5	16
16.8	61.85	107	42.9	14	28.12	30	46.0	5	57.56	29	52.7	10	5.55	39	29.1	14
26.7	62.96	111	41.9	10	28.42	30	47.0	10	57.88	32	51.5	12	5.96	41	27.8	13
ov. 5.7	64.09	113	41.4	5	28.74	32	48.4	14	58.20	32	50.2	13	6.38	42	26.7	11
15.7	65.20	111	41.4	0	29.06	32	50.2	18	58.53	33	48.8	14	6.80	42	25.8	9
25.7	66.28	108	41.8	4	29.37	31	52.2	20	58.84	31	47.2	16	7.22	42	25.2	6
ec. 5.6	67.30	102	42.8	10	29.66	29	54.6	24	59.15	31	45.6	16	7.63	41	24.9	3
15.6	68.22	92	44.2	14	29.93	27	57.1	25	59.43	28	44.1	15	8.00	37	24.9	0
25.6	69.02	80	46.0	18	30.17	24	59.7	26	59.69	26	42.6	15	8.34	34	25.2	3
35.6	69.67	65	48.3	23	30.37	20	62.3	26	59.90	21	41.3	13	8.63	29	25.8	6
δ, Tan δ	4.139		+4.016		1.038		−0.278		1.014		+0.166		1.378		+0.948	
n Place	53ˢ.844		64″.57		25ˢ.556		53″.12		54ˢ.404		53″.87		1ˢ.414		42″.48	
α, $D_\omega \alpha$	+0.09		+0.14		−0.01		−0.01		0.00		+0.01		+0.02		+0.04	
δ, $D_\omega \delta$	−0.2		+0.8		−0.2		+0.8		−0.2		+0.8		−0.2		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*d*¹ Cancri. Mag. 5.9				ε Argûs. Mag. 1.7				30 Monocerotis. Mag. 4.0				θ Chamæleontis Mag. 4.3		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Decli- tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	8 18		+18 36		8 20		−59 13		8 21		− 3 37		8 23		−77
	s		″		s		″		s		″		s		″
Jan. 0.6	31.95		21.0		48.39		57.5		26.62		39.1		16.54		26.3
10.5	32.16	21	20.3	7	48.58	19	61.4	39	26.81	19	41.1	20	16.81	27	30.1
20.5	32.32	16	19.8	5	48.68	10	65.2	38	26.95	14	43.0	19	16.88	7	34.0
30.5	32.42	10	19.5	3	48.69	1	69.0	38	27.04	9	44.6	16	16.77	11	37.8
Feb. 9.5	32.47	5	19.4	1	48.62	7	72.7	37	27.08	4	46.1	15	16.47	30	41.6
19.4	32.47	0	19.5	1	48.47	15	76.1	34	27.07	1	47.3	12	16.01	46	45.2
Mar. 1.4	32.42	5	19.7	2	48.25	22	79.2	31	27.02	5	48.3	10	15.40	61	48.4
11.4	32.33	9	20.0	3	47.97	28	81.8	26	26.93	9	49.0	7	14.65	75	51.4
21.4	32.21	12	20.3	3	47.64	33	84.1	23	26.81	12	49.5	5	13.80	85	53.9
31.3	32.07	14	20.7	4	47.27	37	85.9	18	26.67	14	49.8	3	12.87	93	55.9
Apr. 10.3	31.91	16	21.0	3	46.89	38	87.1	12	26.53	14	49.9	1	11.88	99	57.5
20.3	31.76	15	21.4	4	46.49	40	87.9	8	26.38	15	49.8	1	10.86	102	58.5
30.2	31.61	15	21.7	3	46.10	39	88.1	2	26.23	15	49.5	3	9.84	102	59.0
May 10.2	31.48	13	21.9	2	45.72	38	87.8	3	26.10	13	49.1	4	8.84	100	59.0
20.2	31.37	11	22.1	2	45.37	35	87.0	8	25.99	11	48.5	6	7.88	96	58.5
30.2	31.28	9	22.3	2	45.05	32	85.8	12	25.90	9	47.7	8	6.99	89	57.4
June 9.1	31.23	5	22.3	0	44.78	27	84.0	18	25.84	6	46.9	8	6.18	81	55.9
19.1	31.21	2	22.4	1	44.55	23	81.9	21	25.81	3	45.9	10	5.48	70	53.9
29.1	31.22	1	22.3	1	44.38	17	79.4	25	25.81	0	44.9	10	4.91	57	51.5
July 9.1	31.26	4	22.3	0	44.27	11	76.7	27	25.84	3	43.8	11	4.47	44	48.8
19.0	31.34	8	22.1	2	44.22	5	73.7	30	25.90	6	42.7	11	4.19	28	45.9
29.0	31.45	11	21.9	2	44.24	2	70.7	30	25.99	9	41.6	11	4.07	12	42.9
Aug. 8.0	31.59	14	21.6	3	44.32	8	67.6	31	26.10	11	40.6	10	4.11	4	39.8
17.9	31.75	16	21.2	4	44.48	16	64.7	29	26.25	15	39.8	8	4.32	21	36.7
27.9	31.95	20	20.7	5	44.70	22	62.0	27	26.43	18	39.1	7	4.70	38	33.8
Sept. 6.9	32.17	22	20.1	6	44.98	28	59.5	25	26.63	20	38.7	4	5.23	53	31.2
16.9	32.42	25	19.3	8	45.32	34	57.5	20	26.85	22	38.5	2	5.91	68	28.9
26.8	32.69	27	18.4	9	45.71	39	56.0	15	27.10	25	38.6	1	6.72	81	27.1
Oct. 6.8	32.98	29	17.4	10	46.15	44	55.0	10	27.37	27	39.0	4	7.63	91	25.9
16.8	33.29	31	16.3	11	46.62	47	54.7	3	27.66	29	39.8	8	8.62	99	25.3
26.8	33.61	32	15.0	13	47.11	49	55.0	3	27.97	31	40.9	11	9.64	102	25.3
Nov. 5.7	33.94	33	13.7	13	47.61	50	56.0	10	28.28	31	42.3	14	10.67	103	26.0
15.7	34.28	34	12.3	14	48.10	49	57.7	17	28.60	32	43.9	16	11.68	101	27.4
25.7	34.62	34	11.0	13	48.57	47	59.9	22	28.91	31	45.8	19	12.62	94	29.4
Dec. 5.6	34.94	32	9.7	13	49.01	44	62.7	28	29.21	30	47.8	20	13.46	84	31.9
15.6	35.24	30	8.5	12	49.39	38	65.8	31	29.49	28	49.9	21	14.17	71	34.9
25.6	35.51	27	7.5	10	49.70	31	69.4	36	29.75	26	52.0	21	14.73	56	38.3
35.6	35.75	24	6.7	8	49.94	24	73.1	37	29.96	21	54.1	21	15.11	38	42.0
Sec δ, Tan δ	1.055		+0.337		1.955		−1.680		1.002		−0.063		4.517		−4.4
Mean Place	29ˢ.938		21″.16		46ˢ.247		68″.47		24ˢ.869		42″.18		12ˢ.619		38″.8
D′ψ a, Dω a	+0.01		+0.01		−0.04		−0.06		0.00		0.00		−0.09		−0.17
Dψ δ, Dω δ	−0.2		+0.8		−0.2		+0.8		−0.2		+0.8		−0.2		+0.8

ean Solar Date.	**o Ursæ Majoris.** Mag. 3.5				**Groombridge 1450.** Mag. 6.0				**η Cancri.** Mag. 5.5				**Groombridge 1446.** Mag. 6.3			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 8 23		° ′ +60 59		h m 8 27		° ′ +38 18		h m 8 27		° ′ +20 43		h m 8 30		° ′ +73 55	
	s		″		s		″		s		″		s		″	
an. 0.6	16.84		67.6		26.19		28.3		49.79		49.3		23.78		35.0	
10.5	17.19	35	69.3	17	26.45	26	28.7	4	50.01	22	48.7	6	24.34	56	37.2	22
20.5	17.45	26	71.2	19	26.64	19	29.4	7	50.18	17	48.3	4	24.75	41	39.7	25
30.5	17.61	16	73.3	21	26.77	13	30.3	9	50.29	11	48.2	1	24.99	24	42.4	27
eb. 9.5	17.68	7	75.6	23	26.84	7	31.4	11	50.35	6	48.2	0	25.07	8	45.1	27
19.4	17.64	4	77.8	22	26.84	0	32.5	11	50.36	1	48.3	1	24.98	9	47.8	27
ar. 1.4	17.52	12	80.0	22	26.79	5	33.7	12	50.32	4	48.6	3	24.74	24	50.4	26
11.4	17.32	20	81.9	19	26.69	10	34.9	12	50.24	8	49.0	4	24.36	38	52.7	23
21.4	17.05	27	83.6	17	26.54	15	36.0	11	50.12	12	49.5	5	23.87	49	54.6	19
31.3	16.73	32	84.9	13	26.37	17	36.9	9	49.98	14	49.9	4	23.29	58	56.1	15
pr. 10.3	16.39	34	85.8	9	26.18	19	37.7	8	49.83	15	50.4	5	22.65	64	57.2	11
20.3	16.04	35	86.3	5	25.98	20	38.2	5	49.67	16	50.8	4	21.99	66	57.7	5
30.2	15.70	34	86.4	1	25.79	19	38.5	3	49.52	15	51.1	3	21.33	66	57.7	0
ay 10.2	15.38	32	86.0	4	25.62	17	38.5	0	49.39	13	51.4	3	20.70	63	57.2	5
20.2	15.09	29	85.2	8	25.47	15	38.3	2	49.27	12	51.5	1	20.12	58	56.2	10
30.2	14.85	24	84.0	12	25.35	12	37.8	5	49.18	9	51.6	1	19.62	50	54.7	15
une 9.1	14.67	18	82.5	15	25.27	8	37.2	6	49.12	6	51.6	0	19.22	40	52.8	19
19.1	14.56	11	80.6	19	25.23	4	36.3	9	49.09	3	51.6	0	18.92	30	50.5	23
29.1	14.51	5	78.5	21	25.22	1	35.3	10	49.09	0	51.5	1	18.73	19	48.0	25
uly 9.1	14.52	1	76.3	22	25.26	4	34.1	12	49.13	4	51.3	2	18.67	6	45.2	28
19.0	14.61	9	73.8	25	25.34	8	32.9	12	49.19	6	51.0	3	18.73	6	42.2	30
29.0	14.76	15	71.3	25	25.45	11	31.5	14	49.29	10	50.6	4	18.90	17	39.2	30
ug. 8.0	14.98	22	68.7	26	25.60	15	30.0	15	49.42	13	50.2	4	19.20	30	36.1	31
17.9	15.25	27	66.1	26	25.79	19	28.5	15	49.58	16	49.6	6	19.60	40	33.0	31
27.9	15.59	34	63.6	25	26.01	22	26.9	16	49.77	19	49.0	6	20.12	52	30.0	30
ept. 6.9	15.98	39	61.2	24	26.27	26	25.3	16	49.99	22	48.2	8	20.73	61	27.1	29
16.9	16.41	43	58.9	23	26.55	28	23.7	16	50.23	24	47.3	9	21.43	70	24.5	26
26.8	16.90	49	56.8	21	26.86	31	22.1	16	50.50	27	46.3	10	22.22	79	22.1	24
ct. 6.8	17.42	52	54.9	19	27.20	34	20.5	16	50.79	29	45.2	11	23.08	86	20.0	21
16.8	17.97	55	53.3	16	27.56	36	19.0	15	51.10	31	43.9	13	23.99	91	18.3	17
26.8	18.55	58	51.9	14	27.94	38	17.6	14	51.43	33	42.6	13	24.94	95	17.0	13
ov. 5.7	19.15	60	51.0	9	28.34	40	16.3	13	51.77	34	41.2	14	25.92	98	16.1	9
15.7	19.74	59	50.4	6	28.74	40	15.3	10	52.11	34	39.8	14	26.91	99	15.6	5
25.7	20.33	59	50.2	2	29.13	39	14.4	9	52.45	34	38.4	14	27.88	97	15.7	1
ec. 5.6	20.90	57	50.5	3	29.51	38	13.8	6	52.79	34	37.2	12	28.80	92	16.3	6
15.6	21.42	52	51.2	7	29.87	36	13.4	4	53.10	31	36.1	11	29.66	86	17.4	11
25.6	21.89	47	52.2	10	30.20	33	13.4	0	53.38	28	35.1	10	30.42	76	18.9	15
35.6	22.29	40	53.7	15	30.48	28	13.6	2	53.62	24	34.4	7	31.06	64	20.8	19
c δ, Tan δ	2.063		+1.804		1.274		+0.790		1.069		+0.378		3.612		+3.471	
an Place	$12^s.908$		72″.47		$23^s.718$		31″.60		$47^s.760$		50″.34		$17^s.206$		41″.20	
$\phi\alpha$, $D_\omega \alpha$	+0.04		+0.07		+0.02		+0.03		+0.01		+0.02		+0.07		+0.14	
$\phi\delta$, $D_\omega \delta$	−0.2		+0.8		−0.2		+0.8		−0.2		+0.8		−0.2		+0.8	

Mean Solar Date.	δ Hydræ. Mag. 4.2				σ Hydræ. Mag. 4.5				γ Cancri. Mag. 4.7				δ Cancri. Mag. 4.2		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.
	h m 8 33 s		° ′ + 5 59 ″		h m 8 34 s		° ′ + 3 38 ″		h m 8 38 s		° ′ +21 46 ″		h m 8 39 s		° +18 2 ″
Jan. 0.6	11.26	21	64.3	15	20.74	20	27.7	16	24.22	23	28.0	6	53.38	23	61.3
10.6	11.47	16	62.8	13	20.94	16	26.1	15	24.45	18	27.4	4	53.61	18	60.5
20.5	11.63	11	61.5	11	21.10	11	24.6	13	24.63	13	27.0	1	53.79	13	60.0
30.5	11.74	6	60.4	9	21.21	6	23.3	10	24.76	7	26.9	1	53.92	7	59.6
Feb. 9.5	11.80	1	59.5	7	21.27	1	22.3	9	24.83	2	27.0	2	53.99	2	59.4
19.4	11.81	4	58.8	5	21.28	4	21.4	6	24.85	3	27.2	4	54.01	3	59.5
Mar. 1.4	11.77	7	58.3	3	21.24	7	20.8	4	24.82	8	27.6	4	53.98	7	59.7
11.4	11.70	11	58.0	2	21.17	11	20.4	2	24.74	11	28.0	6	53.91	11	60.0
21.4	11.59	13	57.8	0	21.06	13	20.2	1	24.63	13	28.6	5	53.80	13	60.3
31.3	11.46	14	57.8	1	20.93	13	20.1	1	24.50	15	29.1	5	53.67	15	60.8
Apr. 10.3	11.32	15	57.9	3	20.80	15	20.2	1	24.35	16	29.6	4	53.52	15	61.2
20.3	11.17	14	58.2	3	20.65	14	20.3	3	24.19	15	30.0	4	53.37	14	61.6
30.3	11.03	13	58.5	4	20.51	13	20.6	4	24.04	14	30.4	3	53.23	14	62.0
May 10.2	10.90	11	58.9	4	20.38	11	21.0	5	23.90	12	30.7	2	53.09	12	62.3
20.2	10.79	9	59.3	5	20.27	9	21.5	6	23.78	10	30.9	1	52.97	9	62.5
30.2	10.70	6	59.8	5	20.18	7	22.1	6	23.68	6	31.0	0	52.88	7	62.7
June 9.1	10.64	3	60.3	6	20.11	3	22.7	6	23.62	4	31.0	1	52.81	3	62.8
19.1	10.61	0	60.9	6	20.08	1	23.3	7	23.58	1	30.9	2	52.78	1	62.9
29.1	10.61	2	61.5	6	20.07	3	24.0	7	23.57	3	30.7	2	52.77	2	62.8
July 9.1	10.63	6	62.1	5	20.10	5	24.7	7	23.60	6	30.5	4	52.79	6	62.8
19.0	10.69	8	62.6	5	20.15	9	25.4	6	23.66	9	30.1	4	52.85	9	62.6
29.0	10.77	12	63.1	4	20.24	11	26.0	5	23.75	12	29.7	6	52.94	11	62.3
Aug. 8.0	10.89	14	63.5	3	20.35	14	26.5	5	23.87	15	29.1	6	53.05	15	62.0
18.0	11.03	17	63.8	1	20.49	16	27.0	2	24.02	18	28.5	8	53.20	18	61.5
27.9	11.20	20	63.9	0	20.65	20	27.2	1	24.20	21	27.7	9	53.38	20	60.9
Sept. 6.9	11.40	22	63.9	3	20.85	22	27.3	2	24.41	23	26.8	10	53.58	23	60.2
16.9	11.62	24	63.6	5	21.07	24	27.1	4	24.64	26	25.8	11	53.81	25	59.4
26.8	11.86	27	63.1	7	21.31	27	26.7	6	24.90	29	24.7	12	54.06	28	58.4
Oct. 6.8	12.13	29	62.4	10	21.58	29	26.1	10	25.19	31	23.5	13	54.34	30	57.2
16.8	12.42	31	61.4	12	21.87	30	25.1	12	25.50	32	22.2	14	54.64	32	55.9
26.8	12.73	31	60.2	14	22.17	32	23.9	14	25.82	34	20.8	15	54.96	33	54.5
Nov. 5.7	13.04	33	58.8	16	22.49	32	22.5	16	26.16	35	19.3	14	55.29	34	53.1
15.7	13.37	32	57.2	17	22.81	32	20.9	17	26.51	34	17.9	14	55.63	34	51.6
25.7	13.69	31	55.5	18	23.13	31	19.2	19	26.85	34	16.5	13	55.97	33	50.1
Dec. 5.7	14.00	30	53.7	17	23.44	29	17.3	18	27.19	32	15.2	12	56.30	32	48.7
15.6	14.30	26	52.0	17	23.73	27	15.5	19	27.51	29	14.0	9	56.62	29	47.4
25.6	14.56	23	50.3	16	24.00	23	13.6	17	27.80	26	13.1	8	56.91	25	46.2
35.6	14.79		48.7		24.23		11.9		28.06		12.3		57.16		45.3
Sec δ, Tan δ	1.005		+0.105		1.002		+0.064		1.077		+0.399		1.054		+0.33
Mean Place	$9^{s}.464$		63″.19		$18^{s}.967$		26″.23		$22^{s}.201$		29″.82		$51^{s}.429$		62″.70
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		0.00		0.00		0.00		+0.01		+0.02		+0.01		+0.01
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.2		+0.8		−0.2		+0.8		−0.3		+0.8		−0.3		+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**α Pyxidis.** Mag. 3.7				**ι Cancri.** Mag. 4.2				**ε Hydræ.** Mag. 3.5				**δ Argûs.** Mag. 2.0			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 8 40 s		° ′ −32 52 ″		h m 8 41 s		° ′ +29 3 ″		h m 8 42 s		° ′ + 6 43 ″		h m 8 42 s		° ′ −54 23 ″	
an. 0.6	12.19		38.1		35.63		74.5		18.36		53.7		23.05		37.1	
10.6	12.38	19	41.4	33	35.87	24	74.3	2	18.58	22	52.2	15	23.27	22	40.9	38
20.5	12.53	15	44.6	32	36.06	19	74.4	1	18.75	17	50.9	13	23.41	14	44.7	38
30.5	12.62	9	47.8	32	36.20	14	74.7	3	18.87	12	49.8	11	23.48	7	48.5	38
eb. 9.5	12.65	3	50.8	30	36.28	8	75.2	5	18.93	6	48.9	9	23.47	1	52.1	36
19.4	12.63	2	53.5	27	36.30	2	75.9	7	18.95	2	48.3	6	23.39	8	55.6	35
ar. 1.4	12.55	8	56.0	25	36.27	3	76.7	8	18.92	3	47.8	5	23.24	15	58.7	31
11.4	12.44	11	58.1	21	36.20	7	77.5	8	18.86	6	47.5	3	23.03	21	61.5	28
21.4	12.29	15	59.8	17	36.08	12	78.3	8	18.76	10	47.4	1	22.78	25	63.9	24
31.3	12.11	18	61.1	13	35.94	14	79.1	8	18.63	13	47.5	1	22.50	28	65.9	20
pr. 10.3	11.92	19	62.0	9	35.78	16	79.7	6	18.49	14	47.6	1	22.19	31	67.3	14
20.3	11.73	19	62.5	5	35.61	17	80.3	6	18.35	14	47.8	2	21.86	33	68.3	10
30.3	11.53	20	62.6	1	35.45	16	80.7	4	18.21	14	48.1	3	21.54	32	68.7	4
ay 10.2	11.35	18	62.3	3	35.30	15	80.9	2	18.08	13	48.5	4	21.22	32	68.7	0
20.2	11.18	17	61.6	7	35.17	13	81.0	1	17.97	11	49.0	5	20.92	30	68.1	6
30.2	11.03	15	60.6	10	35.06	11	80.9	1	17.88	9	49.4	4	20.65	27	67.1	10
une 9.1	10.91	12	59.2	14	34.98	8	80.6	3	17.81	7	50.0	6	20.41	24	65.6	15
19.1	10.82	9	57.5	17	34.94	4	80.2	4	17.77	4	50.5	5	20.21	20	63.7	19
29.1	10.76	6	55.5	20	34.93	1	79.7	5	17.76	1	51.0	5	20.06	15	61.4	23
uly 9.1	10.73	3	53.3	22	34.95	2	79.1	6	17.78	2	51.5	5	19.95	11	58.9	25
19.0	10.74	1	51.0	23	35.01	6	78.3	8	17.83	5	52.0	5	19.89	6	56.1	28
29.0	10.79	5	48.7	23	35.10	9	77.4	9	17.90	7	52.5	5	19.89	0	53.2	29
ug. 8.0	10.87	8	46.4	23	35.22	12	76.4	10	18.01	11	52.8	3	19.95	6	50.3	29
18.0	10.99	12	44.2	22	35.38	16	75.4	10	18.14	13	53.0	2	20.06	11	47.4	29
27.9	11.15	16	42.1	21	35.57	19	74.2	12	18.30	16	53.1	1	20.24	18	44.7	27
ept. 6.9	11.34	19	40.4	17	35.78	21	72.9	13	18.49	19	53.0	1	20.47	23	42.3	24
16.9	11.56	22	39.0	14	36.03	25	71.6	13	18.71	22	52.7	3	20.75	28	40.2	21
26.8	11.82	26	38.0	10	36.30	27	70.2	14	18.95	24	52.1	6	21.08	33	38.6	16
ct. 6.8	12.11	29	37.5	5	36.60	30	68.7	15	19.21	26	51.3	8	21.46	38	37.6	10
16.8	12.43	32	37.5	0	36.92	32	67.2	15	19.50	29	50.3	10	21.87	41	37.1	5
26.8	12.76	33	38.1	6	37.26	34	65.8	14	19.80	30	49.0	13	22.31	44	37.3	2
ov. 5.7	13.11	35	39.2	11	37.62	36	64.3	15	20.12	32	47.6	14	22.77	46	38.1	8
15.7	13.46	35	40.9	17	37.99	37	62.9	14	20.44	32	46.0	16	23.23	46	39.5	14
25.7	13.80	34	43.0	21	38.35	36	61.7	12	20.77	33	44.3	17	23.67	44	41.6	21
ec. 5.7	14.13	33	45.6	26	38.71	36	60.6	11	21.09	32	42.5	18	24.09	42	44.2	26
15.6	14.44	31	48.5	29	39.05	34	59.7	9	21.38	29	40.7	18	24.47	38	47.2	30
25.6	14.71	27	51.6	31	39.36	31	59.1	6	21.66	28	39.0	17	24.79	32	50.6	34
35.6	14.94	23	54.8	32	39.63	27	58.8	3	21.90	24	37.4	16	25.05	26	54.3	37
c δ, Tan δ	1.191		−0.646		1.144		+0.556		1.007		+0.118		1.718		−1.397	
ean Place	10ˢ.562		45″.90		33ˢ.460		77″.68		16ˢ.581		53″.13		21ˢ.198		48″.19	
φα, Dω α	−0.01		−0.03		+0.01		+0.02		0.00		+0.01		−0.03		−0.06	
φδ, Dω δ	−0.3		+0.8		−0.3		+0.8		−0.3		+0.8		−0.3		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ^2 Cancri (*mean*). Mag. 5.5				**ζ Hydræ.** Mag. 3.3				**ι Ursæ Majoris.** Mag. 3.1				**α Cancri.** Mag. 4.3		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.
	h m 8 49		° ′ +30 53		h m 8 50		° ′ + 6 15		h m 8 53		° ′ +48 22		h m 8 53		° +12 1
	s		″		s		″		s		″		s		″
Jan. 0.6	5.94		63.6		55.91		71.3		26.54		27.6		52.24		73.6
10.6	6.20	26	63.5	1	56.13	22	69.8	15	26.85	31	28.4	8	52.47	23	72.4
20.5	6.40	20	63.6	1	56.31	18	68.4	14	27.10	25	29.5	11	52.66	19	71.4
30.5	6.55	15	64.0	4	56.43	12	67.3	11	27.28	18	30.9	14	52.79	13	70.6
Feb. 9.5	6.64	9	64.6	6	56.51	8	66.3	10	27.39	11	32.5	16	52.87	8	70.0
19.5	6.67	3	65.4	8	56.53	2	65.6	7	27.42	3	34.2	17	52.90	3	69.7
Mar. 1.4	6.64	3	66.3	9	56.51	2	65.1	5	27.38	4	36.0	18	52.89	1	69.5
11.4	6.57	7	67.2	9	56.45	6	64.8	3	27.28	10	37.7	17	52.83	6	69.5
21.4	6.46	11	68.1	9	56.36	9	64.7	1	27.13	15	39.2	15	52.74	9	69.7
31.3	6.32	14	68.9	8	56.24	12	64.7	0	26.93	20	40.6	14	52.62	12	69.9
Apr. 10.3	6.16	16	69.7	8	56.11	13	64.9	2	26.71	22	41.7	11	52.48	14	70.2
20.3	5.99	17	70.3	6	55.97	14	65.1	2	26.48	23	42.5	8	52.34	14	70.5
30.3	5.83	16	70.8	5	55.83	14	65.4	3	26.25	23	42.9	4	52.20	14	70.9
May 10.2	5.67	16	71.0	2	55.70	13	65.8	4	26.03	22	43.1	2	52.07	13	71.3
20.2	5.54	13	71.1	1	55.58	12	66.2	4	25.82	21	42.9	2	51.96	11	71.7
30.2	5.42	12	71.0	1	55.49	9	66.7	5	25.65	17	42.3	6	51.86	10	72.0
June 9.2	5.34	8	70.7	3	55.42	7	67.3	6	25.51	14	41.4	9	51.79	7	72.4
19.1	5.28	6	70.3	4	55.37	5	67.8	5	25.42	9	40.3	11	51.74	5	72.7
29.1	5.26	2	69.7	6	55.36	1	68.3	5	25.37	5	38.9	14	51.73	1	73.0
July 9.1	5.28	2	68.9	8	55.37	1	68.9	6	25.36	1	37.2	17	51.74	1	73.2
19.0	5.33	5	68.0	9	55.41	4	69.4	5	25.40	4	35.4	18	51.78	4	73.4
29.0	5.41	8	67.0	10	55.48	7	69.8	4	25.48	8	33.4	20	51.85	7	73.5
Aug. 8.0	5.53	12	65.9	11	55.58	10	70.2	4	25.61	13	31.4	20	51.95	10	73.5
18.0	5.68	15	64.7	12	55.70	12	70.4	2	25.78	17	29.2	22	52.08	13	73.3
27.9	5.86	18	63.4	13	55.86	16	70.4	0	26.00	22	27.0	22	52.23	15	73.1
Sept. 6.9	6.08	22	62.0	14	56.04	18	70.3	1	26.26	26	24.8	22	52.41	18	72.6
16.9	6.32	24	60.6	14	56.24	20	70.0	3	26.55	29	22.6	22	52.62	21	72.0
26.9	6.59	27	59.1	15	56.48	24	69.5	5	26.88	33	20.4	22	52.86	24	71.2
Oct. 6.8	6.89	30	57.5	16	56.74	26	68.7	8	27.25	37	18.4	20	53.12	26	70.2
16.8	7.21	32	55.9	16	57.02	28	67.7	10	27.65	40	16.5	19	53.41	29	69.0
26.8	7.56	35	54.4	15	57.32	30	66.4	13	28.07	42	14.8	17	53.71	30	67.6
Nov. 5.7	7.92	36	52.9	15	57.63	31	64.9	15	28.51	44	13.3	15	54.04	33	66.1
15.7	8.29	37	51.4	15	57.96	33	63.3	16	28.97	46	12.1	12	54.37	33	64.5
25.7	8.66	37	50.2	12	58.29	33	61.5	18	29.43	46	11.2	9	54.70	33	62.8
Dec. 5.7	9.03	37	49.1	11	58.61	32	59.7	18	29.88	45	10.6	6	55.03	33	61.2
15.6	9.38	35	48.3	8	58.91	30	57.9	18	30.31	43	10.4	2	55.34	31	59.6
25.6	9.70	32	47.7	6	59.19	28	56.2	17	30.70	39	10.6	2	55.63	29	58.1
35.6	9.98	28	47.4	3	59.43	24	54.5	17	31.05	35	11.2	6	55.88	25	56.7
Sec δ, Tan δ	1.165		+0.598		1.006		+0.110		1.505		+1.125		1.023		+0.21
Mean Place	$3^{s}.755$		67″.52		$54^{s}.154$		71″.00		$23^{s}.714$		34″.26		$50^{s}.424$		74″.60
$D'_\psi\alpha$, $D_\omega\alpha$	+0.01		+0.03		0.00		0.00		+0.02		+0.05		0.00		+0.01
$D_\psi\delta$, $D_\omega\delta$	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	*b*¹ Carinæ. Mag. 5.1				κ Ursæ Majoris. Mag. 3.7				σ² Ursæ Majoris. Mag. 4.9				κ Cancri. Mag. 5.1			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	8 54		−58 53		8 57		+47 29		9 2		+67 28		9 3		+11 0	
	s		″		s		″		s		″		s		″	
an. 0.6	55.44		51.9		52.54		29.6		60.66		41.1		10.49		38.1	
10.6	55.69	25	55.6	37	52.85	31	30.3	7	61.15	49	42.8	17	10.73	24	36.8	13
20.5	55.86	17	59.5	39	53.11	26	31.4	11	61.54	39	44.8	20	10.92	19	35.7	11
30.5	55.94	8	63.4	39	53.29	18	32.7	13	61.82	28	47.0	22	11.06	14	34.8	9
eb. 9.5	55.94	0	67.2	38	53.40	11	34.2	15	61.98	16	49.5	25	11.15	9	34.1	7
19.5	55.86	8	70.8	36	53.44	4	35.9	17	62.01	3	52.1	26	11.19	4	33.6	5
ar. 1.4	55.71	15	74.1	33	53.41	3	37.6	17	61.93	8	54.6	25	11.18	1	33.4	2
11.4	55.49	22	77.1	30	53.32	9	39.3	17	61.74	19	57.0	24	11.13	5	33.3	1
21.4	55.22	27	79.7	26	53.18	14	40.9	16	61.46	28	59.1	21	11.05	8	33.4	1
31.4	54.90	32	81.9	22	52.99	19	42.3	14	61.10	36	60.9	18	10.94	11	33.6	2
pr. 10.3	54.55	35	83.6	17	52.78	21	43.4	11	60.69	41	62.3	14	10.81	13	33.9	3
20.3	54.19	36	84.8	12	52.56	22	44.2	8	60.24	45	63.3	10	10.67	14	34.3	4
30.3	53.82	37	85.5	7	52.33	23	44.7	5	59.79	45	63.8	5	10.53	14	34.6	3
ay 10.2	53.45	37	85.7	2	52.11	22	44.9	2	59.34	45	63.8	0	10.40	13	35.1	5
20.2	53.10	35	85.4	3	51.92	19	44.8	1	58.92	42	63.3	5	10.29	11	35.5	4
30.2	52.78	32	84.5	9	51.75	17	44.3	5	58.55	37	62.3	10	10.19	10	35.9	4
une 9.2	52.48	30	83.2	13	51.61	14	43.5	8	58.23	32	60.9	14	10.11	8	36.3	4
19.1	52.23	25	81.4	18	51.51	10	42.4	11	57.98	25	59.1	18	10.06	5	36.6	3
29.1	52.02	21	79.3	21	51.46	5	41.0	14	57.80	18	57.0	21	10.04	2	36.9	3
uly 9.1	51.87	15	76.8	25	51.45	1	39.5	15	57.70	10	54.5	25	10.04	0	37.2	3
19.1	51.77	10	74.0	28	51.48	3	37.7	18	57.69	1	51.9	26	10.07	3	37.4	2
29.0	51.73	4	71.1	29	51.56	8	35.8	19	57.75	6	49.0	29	10.13	6	37.6	2
ug. 8.0	51.76	3	68.2	29	51.69	13	33.8	20	57.90	15	46.1	29	10.22	9	37.6	0
18.0	51.86	10	65.2	30	51.85	16	31.6	22	58.12	22	43.1	30	10.34	12	37.5	1
27.9	52.02	16	62.4	28	52.06	21	29.4	22	58.43	31	40.1	30	10.48	14	37.3	2
ept. 6.9	52.25	23	59.8	26	52.31	25	27.2	22	58.81	38	37.1	30	10.66	18	36.9	4
16.9	52.54	29	57.6	22	52.59	28	25.1	21	59.26	45	34.2	29	10.86	20	36.3	6
26.9	52.89	35	55.8	18	52.91	32	22.9	22	59.78	52	31.5	27	11.09	23	35.5	8
Oct. 6.8	53.30	41	54.5	13	53.27	36	20.8	21	60.36	58	29.1	24	11.34	25	34.6	9
16.8	53.75	45	53.8	7	53.66	39	18.9	19	60.99	63	26.9	22	11.62	28	33.4	12
26.8	54.23	48	53.7	1	54.08	42	17.1	18	61.67	68	25.1	18	11.92	30	32.0	14
Nov. 5.8	54.73	50	54.3	6	54.51	43	15.6	15	62.38	71	23.6	15	12.24	32	30.5	15
15.7	55.23	50	55.6	13	54.96	45	14.3	13	63.11	73	22.6	10	12.57	33	28.8	17
25.7	55.72	49	57.4	18	55.42	46	13.3	10	63.84	73	22.0	6	12.90	33	27.0	18
Dec. 5.7	56.19	47	59.9	25	55.86	44	12.7	6	64.55	71	21.9	1	13.23	33	25.3	17
15.6	56.62	43	62.8	29	56.29	43	12.4	3	65.23	68	22.3	4	13.55	32	23.6	17
25.6	56.99	37	66.1	33	56.68	39	12.6	2	65.86	63	23.3	10	13.84	29	22.0	16
35.6	57.29	30	69.7	36	57.03	35	13.1	5	66.41	55	24.6	13	14.10	26	20.6	14
ec δ, Tan δ	1.936		−1.658		1.480		+1.091		2.610		+2.412		1.019		+0.195	
ean Place	53ˢ.563		63″.91		49ˢ.777		36″.53		56ˢ.001		50″.38		8ˢ.719		39″.25	
$Y_\psi a$, $D_\omega a$	−0.03		−0.08		+0.02		+0.05		+0.04		+0.12		0.00		+0.01	
$\psi\delta$, $D_\omega \delta$	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Argûs. Mag. 2.2				θ Hydræ. Mag. 3.8				β Argûs. Mag. 1.8				83 Cancri. Mag. 6.6		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	9 4		−43 5		9 9		+ 2 40		9 12		−69 21		9 14		+18
	s		″		s		″		s		″		s		″
Jan. 0.6	53.69		11.0		58.26		25.0		18.49		47.4		16.26		55.5
10.6	53.93	24	14.5	35	58.50	24	23.2	18	18.84	35	51.1	37	16.51	25	54.5
20.6	54.10	17	18.1	36	58.69	19	21.6	16	19.08	24	55.0	39	16.72	21	53.7
30.5	54.22	12	21.6	35	58.83	14	20.2	14	19.20	12	59.0	40	16.88	16	53.2
Feb. 9.5	54.27	5	25.0	34	58.93	10	19.0	12	19.21	1	62.9	39	16.99	11	53.0
19.5	54.26	1	28.3	33	58.97	4	18.0	10	19.10	11	66.7	38	17.04	5	53.0
Mar. 1.4	54.19	7	31.3	30	58.97	0	17.3	7	18.88	22	70.3	36	17.05	1	53.1
11.4	54.08	11	33.9	26	58.92	5	16.8	5	18.57	31	73.7	34	17.01	4	53.5
21.4	53.92	16	36.2	23	58.84	8	16.5	3	18.18	39	76.7	30	16.93	8	53.9
31.4	53.73	19	38.0	18	58.73	11	16.3	2	17.72	46	79.3	26	16.82	11	54.4
Apr. 10.3	53.52	21	39.4	14	58.61	12	16.3	0	17.20	52	81.4	21	16.69	13	54.9
20.3	53.29	23	40.4	10	58.48	13	16.5	2	16.65	55	83.0	16	16.55	14	55.4
30.3	53.06	23	40.9	5	58.35	13	16.8	3	16.09	56	84.1	11	16.41	14	55.9
May 10.3	52.83	23	41.0	1	58.22	13	17.1	3	15.52	57	84.7	6	16.27	14	56.3
20.2	52.62	21	40.6	4	58.10	12	17.6	5	14.95	57	84.8	1	16.15	12	56.7
30.2	52.42	20	39.8	8	58.00	10	18.1	5	14.41	54	84.3	5	16.04	11	57.0
June 9.2	52.25	17	38.5	13	57.92	8	18.7	6	13.91	50	83.3	10	15.96	8	57.2
19.1	52.11	14	36.9	16	57.86	6	19.4	7	13.46	45	81.8	15	15.90	6	57.3
29.1	51.99	12	34.9	20	57.83	3	20.0	6	13.07	39	79.8	20	15.87	3	57.3
July 9.1	51.92	7	32.7	22	57.83	0	20.7	7	12.75	32	77.5	23	15.87	0	57.3
19.1	51.88	4	30.3	24	57.85	2	21.3	6	12.51	24	74.9	26	15.89	2	57.1
29.0	51.88	0	27.7	26	57.90	5	21.9	6	12.36	15	72.0	29	15.94	5	56.8
Aug. 8.0	51.93	5	25.1	26	57.98	8	22.4	5	12.31	5	69.0	30	16.02	8	56.4
18.0	52.01	8	22.5	26	58.08	10	22.8	4	12.36	5	65.9	31	16.13	11	55.9
28.0	52.14	13	20.1	24	58.22	14	23.0	2	12.51	15	62.9	30	16.27	14	55.2
Sept. 6.9	52.32	18	17.9	22	58.38	16	23.1	1	12.77	26	60.1	28	16.44	17	54.4
16.9	52.54	22	16.1	18	58.57	19	22.9	2	13.12	35	57.6	25	16.64	20	53.4
26.9	52.80	26	14.6	15	58.79	22	22.4	5	13.57	45	55.4	22	16.87	23	52.3
Oct. 6.8	53.11	31	13.7	9	59.04	25	21.7	7	14.11	54	53.8	16	17.12	25	50.9
16.8	53.44	33	13.3	4	59.31	27	20.7	10	14.71	60	52.7	11	17.40	28	49.5
26.8	53.80	36	13.4	1	59.60	29	19.5	12	15.36	65	52.2	5	17.71	31	47.9
Nov. 5.8	54.19	39	14.2	8	59.91	31	18.0	15	16.05	69	52.4	2	18.03	32	46.3
15.7	54.58	39	15.6	14	60.23	32	16.3	17	16.75	70	53.2	8	18.37	34	44.6
25.7	54.97	39	17.5	19	60.56	33	14.5	18	17.44	69	54.8	16	18.71	34	42.9
Dec. 5.7	55.34	37	19.9	24	60.88	32	12.5	20	18.09	65	56.9	21	19.05	34	41.3
15.6	55.69	35	22.8	29	61.20	32	10.5	20	18.69	60	59.6	27	19.38	33	39.8
25.6	56.01	32	25.9	31	61.49	29	8.5	20	19.20	51	62.7	31	19.69	31	38.4
35.6	56.28	27	29.4	35	61.74	25	6.7	18	19.62	42	66.2	35	19.97	28	37.3
Sec δ, Tan δ	1.369		−0.935		1.001		+0.047		2.838		−2.656		1.052		+0.32
Mean Place	$52^{s}.138$		$20''.84$		$56^{s}.613$		$24''.73$		$16^{s}.325$		$61''.19$		$14^{s}.425$		$58''.66$
$D'_{\psi}\,\alpha$, $D_{\omega}\,\alpha$	−0.02		−0.04		0.00		0.00		−0.05		−0.13		+0.01		+0.02
$D'_{\psi}\,\delta$, $D_{\omega}\,\delta$	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

lean Solar Date.	ι Argûs. Mag. 2.2				40 Lyncis. Mag. 3.3				θ Pyxidis. Mag. 4.9				α Hydræ. Mag. 2.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 14		−58 54		9 15		+34 44		9 17		−25 36		9 23		− 8 17	
	s		″		s		″		s		″		s		″	
an. 0.6	50.50		52.9		55.07		63.1		45.03		6.4		26.16		20.0	
10.6	50.78	28	56.6	37	55.36	29	63.0	1	45.27	24	9.4	30	26.40	24	22.3	23
20.6	50.99	21	60.4	38	55.60	24	63.3	3	45.46	19	12.4	30	26.60	20	24.6	23
30.5	51.12	13	64.3	39	55.78	18	63.8	5	45.59	13	15.3	29	26.75	15	26.6	20
eb. 9.5	51.16	4	68.1	38	55.90	12	64.6	8	45.68	9	18.1	28	26.85	10	28.5	19
19.5	51.13	3	71.8	37	55.96	6	65.5	9	45.71	3	20.7	26	26.90	5	30.1	16
lar. 1.4	51.01	12	75.3	35	55.96	0	66.7	12	45.69	2	23.0	23	26.90	0	31.5	14
11.4	50.83	18	78.5	32	55.91	5	67.9	12	45.63	6	25.0	20	26.86	4	32.7	12
21.4	50.59	24	81.3	28	55.82	9	69.1	12	45.53	10	26.6	16	26.79	7	33.5	8
31.4	50.30	29	83.7	24	55.69	13	70.2	11	45.41	12	27.9	13	26.69	10	34.1	6
pr. 10.3	49.98	32	85.6	19	55.54	15	71.2	10	45.26	15	28.9	10	26.57	12	34.5	4
20.3	49.63	35	87.1	15	55.37	17	72.0	8	45.10	16	29.6	7	26.44	13	34.7	2
30.3	49.28	35	88.1	10	55.20	17	72.7	7	44.94	16	29.8	2	26.30	14	34.6	1
lay 10.3	48.92	36	88.5	4	55.03	17	73.1	4	44.78	16	29.8	0	26.17	13	34.3	3
20.2	48.57	35	88.4	1	54.88	15	73.3	2	44.63	15	29.3	5	26.05	12	33.9	4
30.2	48.24	33	87.8	6	54.74	14	73.2	1	44.49	14	28.6	7	25.94	11	33.3	6
une 9.2	47.94	30	86.7	11	54.63	11	73.0	2	44.38	11	27.6	10	25.85	9	32.5	8
19.1	47.67	27	85.2	15	54.55	8	72.5	5	44.29	9	26.3	13	25.78	7	31.5	10
29.1	47.44	23	83.2	20	54.51	4	71.8	7	44.22	7	24.7	16	25.73	5	30.5	10
uly 9.1	47.26	18	80.9	23	54.49	2	70.9	9	44.18	4	23.0	17	25.71	2	29.4	11
19.1	47.14	12	78.3	26	54.51	2	69.8	11	44.17	1	21.1	19	25.71	0	28.3	11
29.0	47.07	7	75.5	28	54.56	5	68.6	12	44.18	1	19.2	19	25.74	3	27.1	12
ug. 8.0	47.06	1	72.6	29	54.65	9	67.2	14	44.23	5	17.3	19	25.80	6	26.0	11
18.0	47.12	6	69.7	29	54.78	13	65.7	15	44.32	9	15.4	19	25.89	9	25.0	10
28.0	47.25	13	66.8	29	54.93	15	64.1	16	44.44	12	13.7	17	26.01	12	24.2	8
ept. 6.9	47.45	20	64.1	27	55.12	19	62.4	17	44.59	15	12.2	15	26.15	14	23.6	6
16.9	47.71	26	61.8	23	55.34	22	60.6	18	44.77	18	10.9	13	26.33	18	23.2	4
26.9	48.04	33	59.8	20	55.60	26	58.7	19	44.99	22	10.1	8	26.53	20	23.1	1
ct. 6.8	48.42	38	58.4	14	55.88	28	56.9	18	45.24	25	9.7	4	26.77	24	23.4	3
16.8	48.86	44	57.5	9	56.20	32	55.0	19	45.52	28	9.7	0	27.03	26	24.0	6
26.8	49.33	47	57.2	3	56.54	34	53.1	19	45.83	31	10.2	5	27.32	29	25.0	10
Nov. 5.8	49.83	50	57.5	3	56.91	37	51.4	17	46.16	33	11.3	11	27.63	31	26.3	13
15.7	50.34	51	58.5	10	57.29	38	49.8	16	46.50	34	12.7	14	27.95	32	27.9	16
25.7	50.85	51	60.2	17	57.68	39	48.3	15	46.84	34	14.7	20	28.28	33	29.8	19
Dec. 5.7	51.33	48	62.4	22	58.06	38	47.1	12	47.18	34	17.0	23	28.60	32	32.0	22
15.7	51.78	45	65.2	28	58.43	37	46.2	9	47.50	32	19.6	26	28.92	32	34.2	22
25.6	52.18	40	68.4	32	58.78	35	45.6	6	47.80	30	22.4	28	29.21	29	36.6	24
35.6	52.52	34	71.9	35	59.10	32	45.3	3	48.06	26	25.4	30	29.47	26	39.0	24
ec δ, Tan δ	1.937		−1.659		1.217		+0.694		1.109		−0.479		1.011		−0.146	
lean Place	$48^{s}.782$		$65''.45$		$52^{s}.878$		$69''.62$		$43^{s}.581$		$12''.89$		$24^{s}.653$		$22''.41$	
$_\psi \alpha$, $D_\omega \alpha$	−0.03		−0.08		+0.01		+0.03		−0.01		−0.02		0.00		−0.01	
$_\psi \delta$, $D_\omega \delta$	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*h* Ursæ Majoris. Mag. 3.8				*d* Ursæ Majoris. Mag. 4.6				*θ* Ursæ Majoris. Mag. 3.3				*ψ* Argûs. Mag. 3.6		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	9 24		+63 25		9 26		+70 11		9 27		+52 3		9 27		−40
	s		″		s		″		s		″		s		″
Jan. 0.6	54.53		52.4		64.45		65.6		13.72		45.6		22.38		30.5
10.6	55.01	48	53.7	13	65.05	60	67.1	15	14.09	37	46.3	7	22.64	26	33.9
20.6	55.40	39	55.4	17	65.54	49	69.1	20	14.40	31	47.4	11	22.84	20	37.3
30.5	55.69	29	57.4	20	65.90	36	71.4	23	14.64	24	48.8	14	22.99	15	40.8
Feb. 9.5	55.88	19	59.7	23	66.13	23	73.9	25	14.79	15	50.5	17	23.07	8	44.2
19.5	55.97	9	62.1	24	66.22	9	76.5	26	14.87	8	52.4	19	23.10	3	47.4
Mar. 1.5	55.95	2	64.5	24	66.18	4	79.2	27	14.87	0	54.4	20	23.07	3	50.4
11.4	55.84	11	66.9	24	66.02	16	81.8	26	14.81	6	56.4	20	22.99	8	53.0
21.4	55.64	20	69.1	22	65.74	28	84.2	24	14.68	13	58.3	19	22.87	12	55.4
31.4	55.37	27	71.1	20	65.37	37	86.3	21	14.50	18	60.0	17	22.71	16	57.3
Apr. 10.3	55.05	32	72.7	16	64.92	45	87.9	16	14.28	22	61.4	14	22.53	18	58.8
20.3	54.69	36	73.9	12	64.43	49	89.2	13	14.04	24	62.6	12	22.34	19	59.9
30.3	54.32	37	74.6	7	63.92	51	90.0	8	13.79	25	63.4	8	22.13	21	60.6
May 10.3	53.95	37	74.9	3	63.40	52	90.2	2	13.54	25	63.8	4	21.93	20	60.9
20.2	53.59	36	74.8	1	62.90	50	89.9	3	13.30	24	63.8	0	21.73	20	60.7
30.2	53.26	33	74.2	6	62.44	46	89.2	7	13.08	22	63.5	3	21.54	19	60.1
June 9.2	52.98	28	73.1	11	62.03	41	87.9	13	12.90	18	62.7	8	21.38	16	59.0
19.2	52.75	23	71.6	15	61.68	35	86.3	16	12.75	15	61.7	10	21.24	14	57.6
29.1	52.57	18	69.8	18	61.41	27	84.2	21	12.64	11	60.3	14	21.12	12	55.9
July 9.1	52.46	11	67.6	22	61.22	19	81.8	24	12.57	7	58.6	17	21.03	9	53.9
19.1	52.42	4	65.2	24	61.12	10	79.1	27	12.56	1	56.7	19	20.98	5	51.7
29.0	52.44	2	62.5	27	61.11	1	76.2	29	12.59	3	54.5	22	20.97	1	49.3
Aug. 8.0	52.52	8	59.7	28	61.19	8	73.1	31	12.67	8	52.2	23	20.99	2	46.8
18.0	52.68	16	56.8	29	61.37	18	70.0	31	12.79	12	49.7	25	21.05	6	44.4
28.0	52.90	22	53.8	30	61.63	26	66.8	32	12.96	17	47.2	25	21.16	11	42.1
Sept. 6.9	53.19	29	50.9	29	61.98	35	63.6	32	13.18	22	44.6	26	21.30	14	39.9
16.9	53.54	35	47.9	30	62.42	44	60.5	31	13.44	26	42.0	26	21.49	19	38.1
26.9	53.95	41	45.1	28	62.93	51	57.5	30	13.75	31	39.5	25	21.73	24	36.6
Oct. 6.9	54.41	46	42.5	26	63.53	60	54.7	28	14.10	35	37.0	25	22.00	27	35.6
16.8	54.93	52	40.1	24	64.19	66	52.2	25	14.49	39	34.7	23	22.31	31	35.1
26.8	55.49	56	37.9	22	64.90	71	50.1	21	14.91	42	32.5	22	22.65	34	35.2
Nov. 5.8	56.09	60	36.1	18	65.67	77	48.3	18	15.36	45	30.6	19	23.02	37	35.8
15.7	56.72	63	34.7	14	66.47	80	46.9	14	15.84	48	29.1	15	23.40	38	37.0
25.7	57.36	64	33.7	10	67.28	81	46.1	8	16.33	49	27.8	13	23.78	38	38.8
Dec. 5.7	57.99	63	33.2	5	68.08	80	45.7	4	16.81	48	26.9	9	24.16	38	41.0
15.7	58.61	62	33.2	0	68.85	77	45.9	2	17.28	47	26.5	4	24.52	36	43.7
25.6	59.18	57	33.7	5	69.58	73	46.6	7	17.72	44	26.5	0	24.85	33	46.8
35.6	59.69	51	34.7	10	70.22	64	47.9	13	18.12	40	26.9	4	25.13	28	50.0
Sec δ, Tan δ	2.235		+2.000		2.953		+2.778		1.627		+1.283		1.307		−0.842
Mean Place	50ˢ.659		63″.55		59ˢ.460		77″.40		10ˢ.855		55″.70		20ˢ.963		40″.03
D′ψ α, Dω α	+0.03		+0.10		+0.05		+0.15		+0.02		+0.07		−0.01		−0.04
δ, Dω δ	−0.3		+0.6		−0.3		+0.6		−0.3		+0.6		−0.3		+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	ξ Leonis. Mag. 5.1				10 Leonis Minoris. Mag. 4.6				ζ Chamæleontis. Mag. 5.2				ο Leonis. Mag. 3.8			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 9 27		° ′ +11 40		h m 9 29		° ′ +36 46		h m 9 36		° ′ −80 33		h m 9 36		° ′ +10 16	
	s		″		s		″		s		″		s		″	
an. 0.6	23.66	26	34.1	14	3.48	30	24.4	0	28.84	76	19.0	34	38.59	26	44.2	14
10.6	23.92	21	32.7	12	3.78	26	24.4	3	29.60	53	22.4	37	38.85	22	42.8	13
20.6	24.13	17	31.5	9	4.04	20	24.7	6	30.13	29	26.1	39	39.07	18	41.5	10
30.5	24.30	12	30.6	6	4.24	14	25.3	8	30.42	6	30.0	40	39.25	12	40.5	8
eb. 9.5	24.42	6	30.0	5	4.38	8	26.1	11	30.48	18	34.0	39	39.37	8	39.7	6
19.5	24.48	2	29.5	2	4.46	2	27.2	13	30.30	40	37.9	38	39.45	2	39.1	3
lar. 1.5	24.50	3	29.3	0	4.48	4	28.5	13	29.90	60	41.7	37	39.47	2	38.8	1
11.4	24.47	7	29.3	1	4.44	9	29.8	13	29.30	79	45.4	33	39.45	6	38.7	1
21.4	24.40	9	29.4	3	4.35	12	31.1	13	28.51	94	48.7	30	39.39	8	38.8	2
31.4	24.31	12	29.7	3	4.23	15	32.4	11	27.57	107	51.7	26	39.31	11	39.0	3
pr. 10.3	24.19	13	30.0	4	4.08	17	33.5	10	26.50	118	54.3	21	39.20	13	39.3	4
20.3	24.06	13	30.4	5	3.91	17	34.5	7	25.32	124	56.4	17	39.07	12	39.7	4
30.3	23.93	13	30.9	4	3.74	17	35.2	5	24.08	129	58.1	12	38.95	13	40.1	5
lay 10.3	23.80	12	31.3	4	3.57	16	35.7	3	22.79	130	59.3	6	38.82	12	40.6	4
20.2	23.68	10	31.7	5	3.41	15	36.0	0	21.49	128	59.9	0	38.70	11	41.0	5
30.2	23.58	9	32.2	4	3.26	12	36.0	2	20.21	123	59.9	5	38.59	9	41.5	4
une 9.2	23.49	6	32.6	3	3.14	9	35.8	5	18.98	115	59.4	10	38.50	7	41.9	4
19.2	23.43	4	32.9	3	3.05	6	35.3	8	17.83	105	58.4	15	38.43	4	42.3	4
29.1	23.39	2	33.2	2	2.99	3	34.5	10	16.78	91	56.9	19	38.39	2	42.7	2
uly 9.1	23.37	1	33.4	2	2.96	0	33.5	11	15.87	74	55.0	24	38.37	0	42.9	3
19.1	23.38	4	33.6	1	2.96	4	32.4	13	15.13	55	52.6	26	38.37	3	43.2	1
29.0	23.42	7	33.7	1	3.00	7	31.1	15	14.58	35	50.0	29	38.40	5	43.3	0
ug. 8.0	23.49	9	33.6	2	3.07	11	29.6	17	14.23	13	47.1	30	38.45	9	43.3	1
18.0	23.58	12	33.4	3	3.18	14	27.9	18	14.10	10	44.1	30	38.54	11	43.2	2
28.0	23.70	15	33.1	5	3.32	18	26.1	18	14.20	34	41.1	30	38.65	14	43.0	5
ept. 6.9	23.85	18	32.6	7	3.50	21	24.3	20	14.54	57	38.1	28	38.79	17	42.5	6
16.9	24.03	21	31.9	9	3.71	25	22.3	20	15.11	78	35.3	24	38.96	20	41.9	9
26.9	24.24	24	31.0	11	3.96	28	20.3	20	15.89	98	32.9	21	39.16	23	41.0	10
ct. 6.9	24.48	27	29.9	13	4.24	32	18.3	21	16.87	115	30.8	15	39.39	26	40.0	13
16.8	24.75	29	28.6	15	4.56	34	16.2	19	18.02	127	29.3	10	39.65	28	38.7	15
26.8	25.04	31	27.1	16	4.90	37	14.3	19	19.29	137	28.3	4	39.93	31	37.2	16
ov. 5.8	25.35	32	25.5	17	5.27	38	12.4	18	20.66	141	27.9	3	40.24	33	35.6	18
15.7	25.67	34	23.8	19	5.65	40	10.6	15	22.07	139	28.2	10	40.57	33	33.8	19
25.7	26.01	34	21.9	18	6.05	40	9.1	13	23.46	134	29.2	16	40.90	34	31.9	19
Dec. 5.7	26.35	32	20.1	18	6.45	38	7.8	9	24.80	123	30.8	23	41.24	32	30.0	18
15.7	26.67	31	18.3	17	6.83	36	6.9	7	26.03	108	33.1	27	41.56	31	28.2	18
25.6	26.98	28	16.6	15	7.19	33	6.2	3	27.11	89	35.8	32	41.87	29	26.4	16
35.6	27.26		15.1		7.52		5.9		28.00		39.0		42.16		24.8	
ec δ, Tan δ	1.021		+0.207		1.248		+0.747		6.097		−6.015		1.016		+0.181	
ean Place	$21^s.973$		36″.59		$1^s.282$		32″.30		$25^s.656$		34″.39		$36^s.960$		46″.82	
$_{\psi} a$, $D_{\omega} a$	0.00		+0.01		+0.01		+0.04		−0.09		−0.32		0.00		+0.01	
$_{\psi} \delta$, $D_{\omega} \delta$	−0.3		+0.6		−0.3		+0.6		−0.3		+0.6		−0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	d^1 Cancri. Mag. 5.9 Right Ascension.		d^1 Cancri. Mag. 5.9 Declination N.		ε Argûs. Mag. 1.7 Right Ascension.		ε Argûs. Mag. 1.7 Declination S.		30 Monocerotis. Mag. 4.0 Right Ascension.		30 Monocerotis. Mag. 4.0 Declination S.		θ Chamæleontis. Mag. 4.3 Right Ascension.		θ Chamæleontis. Mag. 4.3 Declin tion S
	h m 8 18		° ′ +18 36		h m 8 20		° ′ −59 13		h m 8 21		° ′ − 3 37		h m 8 23		° −77
	s		″		s		″		s		″		s		″
Jan. 0.6	31.95		21.0		48.39		57.5		26.62		39.1		16.54		26.3
10.5	32.16	21	20.3	7	48.58	19	61.4	39	26.81	19	41.1	20	16.81	27	30.1
20.5	32.32	16	19.8	5	48.68	10	65.2	38	26.95	14	43.0	19	16.88	7	34.0
30.5	32.42	10	19.5	3	48.69	1	69.0	38	27.04	9	44.6	16	16.77	11	37.8
Feb. 9.5	32.47	5	19.4	1	48.62	7	72.7	37	27.08	4	46.1	15	16.47	30	41.6
19.4	32.47	0	19.5	1	48.47	15	76.1	34	27.07	1	47.3	12	16.01	46	45.2
Mar. 1.4	32.42	5	19.7	2	48.25	22	79.2	31	27.02	5	48.3	10	15.40	61	48.4
11.4	32.33	9	20.0	3	47.97	28	81.8	26	26.93	9	49.0	7	14.65	75	51.4
21.4	32.21	12	20.3	3	47.64	33	84.1	23	26.81	12	49.5	5	13.80	85	53.9
31.3	32.07	14	20.7	4	47.27	37	85.9	18	26.67	14	49.8	3	12.87	93	55.9
Apr. 10.3	31.91	16	21.0	3	46.89	38	87.1	12	26.53	14	49.9	1	11.88	99	57.5
20.3	31.76	15	21.4	4	46.49	40	87.9	8	26.38	15	49.8	1	10.86	102	58.5
30.2	31.61	15	21.7	3	46.10	39	88.1	2	26.23	15	49.5	3	9.84	102	59.0
May 10.2	31.48	13	21.9	2	45.72	38	87.8	3	26.10	13	49.1	4	8.84	100	59.0
20.2	31.37	11	22.1	2	45.37	35	87.0	8	25.99	11	48.5	6	7.88	96	58.5
30.2	31.28	9	22.3	2	45.05	32	85.8	12	25.90	9	47.7	8	6.99	89	57.4
June 9.1	31.23	5	22.3	0	44.78	27	84.0	18	25.84	6	46.9	8	6.18	81	55.9
19.1	31.21	2	22.4	1	44.55	23	81.9	21	25.81	3	45.9	10	5.48	70	53.9
29.1	31.22	1	22.3	1	44.38	17	79.4	25	25.81	0	44.9	10	4.91	57	51.5
July 9.1	31.26	4	22.3	0	44.27	11	76.7	27	25.84	3	43.8	11	4.47	44	48.8
19.0	31.34	8	22.1	2	44.22	5	73.7	30	25.90	6	42.7	11	4.19	28	45.9
29.0	31.45	11	21.9	2	44.24	2	70.7	30	25.99	9	41.6	11	4.07	12	42.9
Aug. 8.0	31.59	14	21.6	3	44.32	8	67.6	31	26.10	11	40.6	10	4.11	4	39.8
17.9	31.75	16	21.2	4	44.48	16	64.7	29	26.25	15	39.8	8	4.32	21	36.7
27.9	31.95	20	20.7	5	44.70	22	62.0	27	26.43	18	39.1	7	4.70	38	33.8
Sept. 6.9	32.17	22	20.1	6	44.98	28	59.5	25	26.63	20	38.7	4	5.23	53	31.2
16.9	32.42	25	19.3	8	45.32	34	57.5	20	26.85	22	38.5	2	5.91	68	28.9
26.8	32.69	27	18.4	9	45.71	39	56.0	15	27.10	25	38.6	1	6.72	81	27.1
Oct. 6.8	32.98	29	17.4	10	46.15	44	55.0	10	27.37	27	39.0	4	7.63	91	25.9
16.8	33.29	31	16.3	11	46.62	47	54.7	3	27.66	29	39.8	8	8.62	99	25.3
26.8	33.61	32	15.0	13	47.11	49	55.0	3	27.97	31	40.9	11	9.64	102	25.3
Nov. 5.7	33.94	33	13.7	13	47.61	50	56.0	10	28.28	31	42.3	14	10.67	103	26.0
15.7	34.28	34	12.3	14	48.10	49	57.7	17	28.60	32	43.9	16	11.68	101	27.4
25.7	34.62	34	11.0	13	48.57	47	59.9	22	28.91	31	45.8	19	12.62	94	29.4
Dec. 5.6	34.94	32	9.7	13	49.01	44	62.7	28	29.21	30	47.8	20	13.46	84	31.9
15.6	35.24	30	8.5	12	49.39	38	65.8	31	29.49	28	49.9	21	14.17	71	34.9
25.6	35.51	27	7.5	10	49.70	31	69.4	36	29.75	26	52.0	21	14.73	56	38.3
35.6	35.75	24	6.7	8	49.94	24	73.1	37	29.96	21	54.1	21	15.11	38	42.0
Sec δ, Tan δ	1.055		+0.337		1.955		−1.680		1.002		−0.063		4.517		−4.40
Mean Place	29ˢ.938		21″.16		46ˢ.247		68″.47		24ˢ.869		42″.18		12ˢ.619		38″.80
$D'_\psi a$, $D_\omega a$	+0.01		+0.01		−0.04		−0.06		0.00		0.00		−0.09		−0.17
$D_\psi \delta$, $D_\omega \delta$	−0.2		+0.8		−0.2		+0.8		−0.2		+0.8		−0.2		+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**o Ursæ Majoris.** Mag. 3.5				**Groombridge 1450.** Mag. 6.0				**η Cancri.** Mag. 5.5				**Groombridge 1446.** Mag. 6.3			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 8 23		° ′ +60 59		h m 8 27		° ′ +38 18		h m 8 27		° ′ +20 43		h m 8 30		° ′ +73 55	
	s		″		s		″		s		″		s		″	
an. 0.6	16.84		67.6		26.19		28.3		49.79		49.3		23.78		35.0	
10.5	17.19	35	69.3	17	26.45	26	28.7	4	50.01	22	48.7	6	24.34	56	37.2	22
20.5	17.45	26	71.2	19	26.64	19	29.4	7	50.18	17	48.3	4	24.75	41	39.7	25
30.5	17.61	16	73.3	21	26.77	13	30.3	9	50.29	11	48.2	1	24.99	24	42.4	27
eb. 9.5	17.68	7	75.6	23	26.84	7	31.4	11	50.35	6	48.2	0	25.07	8	45.1	27
19.4	17.64	4	77.8	22	26.84	0	32.5	11	50.36	1	48.3	1	24.98	9	47.8	27
ar. 1.4	17.52	12	80.0	22	26.79	5	33.7	12	50.32	4	48.6	3	24.74	24	50.4	26
11.4	17.32	20	81.9	19	26.69	10	34.9	12	50.24	8	49.0	4	24.36	38	52.7	23
21.4	17.05	27	83.6	17	26.54	15	36.0	11	50.12	12	49.5	5	23.87	49	54.6	19
31.3	16.73	32	84.9	13	26.37	17	36.9	9	49.98	14	49.9	4	23.29	58	56.1	15
pr. 10.3	16.39	34	85.8	9	26.18	19	37.7	8	49.83	15	50.4	5	22.65	64	57.2	11
20.3	16.04	35	86.3	5	25.98	20	38.2	5	49.67	16	50.8	4	21.99	66	57.7	5
30.2	15.70	34	86.4	1	25.79	19	38.5	3	49.52	15	51.1	3	21.33	66	57.7	0
ay 10.2	15.38	32	86.0	4	25.62	17	38.5	0	49.39	13	51.4	3	20.70	63	57.2	5
20.2	15.09	29	85.2	8	25.47	15	38.3	2	49.27	12	51.5	1	20.12	58	56.2	10
30.2	14.85	24	84.0	12	25.35	12	37.8	5	49.18	9	51.6	1	19.62	50	54.7	15
une 9.1	14.67	18	82.5	15	25.27	8	37.2	6	49.12	6	51.6	0	19.22	40	52.8	19
19.1	14.56	11	80.6	19	25.23	4	36.3	9	49.09	3	51.6	0	18.92	30	50.5	23
29.1	14.51	5	78.5	21	25.22	1	35.3	10	49.09	0	51.5	1	18.73	19	48.0	25
uly 9.1	14.52	1	76.3	22	25.26	4	34.1	12	49.13	4	51.3	2	18.67	6	45.2	28
19.0	14.61	9	73.8	25	25.34	8	32.9	12	49.19	6	51.0	3	18.73	6	42.2	30
29.0	14.76	15	71.3	25	25.45	11	31.5	14	49.29	10	50.6	4	18.90	17	39.2	30
ug. 8.0	14.98	22	68.7	26	25.60	15	30.0	15	49.42	13	50.2	4	19.20	30	36.1	31
17.9	15.25	27	66.1	26	25.79	19	28.5	15	49.58	16	49.6	6	19.60	40	33.0	31
27.9	15.59	34	63.6	25	26.01	22	26.9	16	49.77	19	49.0	6	20.12	52	30.0	30
ept. 6.9	15.98	39	61.2	24	26.27	26	25.3	16	49.99	22	48.2	8	20.73	61	27.1	29
16.9	16.41	43	58.9	23	26.55	28	23.7	16	50.23	24	47.3	9	21.43	70	24.5	26
26.8	16.90	49	56.8	21	26.86	31	22.1	16	50.50	27	46.3	10	22.22	79	22.1	24
ct. 6.8	17.42	52	54.9	19	27.20	34	20.5	16	50.79	29	45.2	11	23.08	86	20.0	21
16.8	17.97	55	53.3	16	27.56	36	19.0	15	51.10	31	43.9	13	23.99	91	18.3	17
26.8	18.55	58	51.9	14	27.94	38	17.6	14	51.43	33	42.6	13	24.94	95	17.0	13
ov. 5.7	19.15	60	51.0	9	28.34	40	16.3	13	51.77	34	41.2	14	25.92	98	16.1	9
15.7	19.74	59	50.4	6	28.74	40	15.3	10	52.11	34	39.8	14	26.91	99	15.6	5
25.7	20.33	59	50.2	2	29.13	39	14.4	9	52.45	34	38.4	14	27.88	97	15.7	1
Dec. 5.6	20.90	57	50.5	3	29.51	38	13.8	6	52.79	34	37.2	12	28.80	92	16.3	6
15.6	21.42	52	51.2	7	29.87	36	13.4	4	53.10	31	36.1	11	29.66	86	17.4	11
25.6	21.89	47	52.2	10	30.20	33	13.4	0	53.38	28	35.1	10	30.42	76	18.9	15
35.6	22.29	40	53.7	15	30.48	28	13.6	2	53.62	24	34.4	7	31.06	64	20.8	19
c δ, Tan δ	2.063		+1.804		1.274		+0.790		1.069		+0.378		3.612		+3.471	
ean Place	12ˢ.908		72″.47		23ˢ.718		31″.60		47ˢ.760		50″.34		17ˢ.206		41″.20	
$_\psi\alpha$, $D_\omega\alpha$	+0.04		+0.07		+0.02		+0.03		+0.01		+0.02		+0.07		+0.14	
$_\psi\delta$, $D_\omega\delta$	−0.2		+0.8		−0.2		+0.8		−0.2		+0.8		−0.2		+0.8	

Mean Solar Date.	δ Hydræ. Mag. 4.2				σ Hydræ. Mag. 4.5				γ Cancri. Mag. 4.7				δ Cancri. Mag. 4.2		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Decli tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	8 33		+ 5 59		8 34		+ 3 38		8 38		+21 46		8 39		+18
	s		″		s		″		s		″		s		″
Jan. 0.6	11.26		64.3		20.74		27.7		24.22		28.0		53.38		61.3
10.6	11.47	21	62.8	15	20.94	20	26.1	16	24.45	23	27.4	6	53.61	23	60.5
20.5	11.63	16	61.5	13	21.10	16	24.6	15	24.63	18	27.0	4	53.79	18	60.0
30.5	11.74	11	60.4	11	21.21	11	23.3	13	24.76	13	26.9	1	53.92	13	59.6
Feb. 9.5	11.80	6	59.5	9	21.27	6	22.3	10	24.83	7	27.0	1	53.99	7	59.4
19.4	11.81	1	58.8	7	21.28	1	21.4	9	24.85	2	27.2	2	54.01	2	59.5
Mar. 1.4	11.77	4	58.3	5	21.24	4	20.8	6	24.82	3	27.6	4	53.98	3	59.7
11.4	11.70	7	58.0	3	21.17	7	20.4	4	24.74	8	28.0	4	53.91	7	60.0
21.4	11.59	11	57.8	2	21.06	11	20.2	2	24.63	11	28.6	6	53.80	11	60.3
31.3	11.46	13	57.8	0	20.93	13	20.1	1	24.50	13	29.1	5	53.67	13	60.8
Apr. 10.3	11.32	14	57.9	1	20.80	13	20.2	1	24.35	15	29.6	5	53.52	15	61.2
20.3	11.17	15	58.2	3	20.65	15	20.3	1	24.19	16	30.0	4	53.37	15	61.6
30.3	11.03	14	58.5	3	20.51	14	20.6	3	24.04	15	30.4	4	53.23	14	62.0
May 10.2	10.90	13	58.9	4	20.38	13	21.0	4	23.90	14	30.7	3	53.09	14	62.3
20.2	10.79	11	59.3	4	20.27	11	21.5	5	23.78	12	30.9	2	52.97	12	62.5
30.2	10.70	9	59.8	5	20.18	9	22.1	6	23.68	10	31.0	1	52.88	9	62.7
June 9.1	10.64	6	60.3	5	20.11	7	22.7	6	23.62	6	31.0	0	52.81	7	62.8
19.1	10.61	3	60.9	6	20.08	3	23.3	6	23.58	4	30.9	1	52.78	3	62.9
29.1	10.61	0	61.5	6	20.07	1	24.0	7	23.57	1	30.7	2	52.77	1	62.8
July 9.1	10.63	2	62.1	6	20.10	3	24.7	7	23.60	3	30.5	2	52.79	2	62.8
19.0	10.69	6	62.6	5	20.15	5	25.4	7	23.66	6	30.1	4	52.85	6	62.6
29.0	10.77	8	63.1	5	20.24	9	26.0	6	23.75	9	29.7	4	52.94	9	62.3
Aug. 8.0	10.89	12	63.5	4	20.35	11	26.5	5	23.87	12	29.1	6	53.05	11	62.0
18.0	11.03	14	63.8	3	20.49	14	27.0	5	24.02	15	28.5	6	53.20	15	61.5
27.9	11.20	17	63.9	1	20.65	16	27.2	2	24.20	18	27.7	8	53.38	18	60.9
Sept. 6.9	11.40	20	63.9	0	20.85	20	27.3	1	24.41	21	26.8	9	53.58	20	60.2
16.9	11.62	22	63.6	3	21.07	22	27.1	2	24.64	23	25.8	10	53.81	23	59.4
26.8	11.86	24	63.1	5	21.31	24	26.7	4	24.90	26	24.7	11	54.06	25	58.4
Oct. 6.8	12.13	27	62.4	7	21.58	27	26.1	6	25.19	29	23.5	12	54.34	28	57.2
16.8	12.42	29	61.4	10	21.87	29	25.1	10	25.50	31	22.2	13	54.64	30	55.9
26.8	12.73	31	60.2	12	22.17	30	23.9	12	25.82	32	20.8	14	54.96	32	54.5
Nov. 5.7	13.04	31	58.8	14	22.49	32	22.5	14	26.16	34	19.3	15	55.29	33	53.1
15.7	13.37	33	57.2	16	22.81	32	20.9	16	26.51	35	17.9	14	55.63	34	51.6
25.7	13.69	32	55.5	17	23.13	32	19.2	17	26.85	34	16.5	14	55.97	34	50.1
Dec. 5.7	14.00	31	53.7	18	23.44	31	17.3	19	27.19	34	15.2	13	56.30	33	48.7
15.6	14.30	30	52.0	17	23.73	29	15.5	18	27.51	32	14.0	12	56.62	32	47.4
25.6	14.56	26	50.3	17	24.00	27	13.6	19	27.80	29	13.1	9	56.91	29	46.2
35.6	14.79	23	48.7	16	24.23	23	11.9	17	28.06	26	12.3	8	57.16	25	45.3
Sec δ, Tan δ	1.005		+0.105		1.002		+0.064		1.077		+0.399		1.054		+0.334
Mean Place	$9^{s}.464$		$63''.19$		$18^{s}.967$		$26''.23$		$22^{s}.201$		$29''.82$		$51^{s}.429$		$62''.70$
$D'_\psi\alpha$, $D_\omega\alpha$	0.00		0.00		0.00		0.00		+0.01		+0.02		+0.01		+0.01
$D_\psi\delta$, $D_\omega\delta$	−0.2		+0.8		−0.2		+0.8		−0.3		+0.8		−0.3		+0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	α Pyxidis. Mag. 3.7				ι Cancri. Mag. 4.2				ε Hydræ. Mag. 3.5				δ Argûs. Mag. 2.0			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	8 40		−32 52		8 41		+29 3		8 42		+ 6 43		8 42		−54 23	
	s		″		s		″		s		″		s		″	
n. 0.6	12.19		38.1		35.63		74.5		18.36		53.7		23.05		37.1	
10.6	12.38	19	41.4	33	35.87	24	74.3	2	18.58	22	52.2	15	23.27	22	40.9	38
20.5	12.53	15	44.6	32	36.06	19	74.4	1	18.75	17	50.9	13	23.41	14	44.7	38
30.5	12.62	9	47.8	32	36.20	14	74.7	3	18.87	12	49.8	11	23.48	7	48.5	38
eb. 9.5	12.65	3	50.8	30	36.28	8	75.2	5	18.93	6	48.9	9	23.47	1	52.1	36
19.4	12.63	2	53.5	27	36.30	2	75.9	7	18.95	2	48.3	6	23.39	8	55.6	35
ar. 1.4	12.55	8	56.0	25	36.27	3	76.7	8	18.92	3	47.8	5	23.24	15	58.7	31
11.4	12.44	11	58.1	21	36.20	7	77.5	8	18.86	6	47.5	3	23.03	21	61.5	28
21.4	12.29	15	59.8	17	36.08	12	78.3	8	18.76	10	47.4	1	22.78	25	63.9	24
31.3	12.11	18	61.1	13	35.94	14	79.1	8	18.63	13	47.5	1	22.50	28	65.9	20
pr. 10.3	11.92	19	62.0	9	35.78	16	79.7	6	18.49	14	47.6	1	22.19	31	67.3	14
20.3	11.73	19	62.5	5	35.61	17	80.3	6	18.35	14	47.8	2	21.86	33	68.3	10
30.3	11.53	20	62.6	1	35.45	16	80.7	4	18.21	14	48.1	3	21.54	32	68.7	4
ay 10.2	11.35	18	62.3	3	35.30	15	80.9	2	18.08	13	48.5	4	21.22	32	68.7	0
20.2	11.18	17	61.6	7	35.17	13	81.0	1	17.97	11	49.0	5	20.92	30	68.1	6
30.2	11.03	15	60.6	10	35.06	11	80.9	1	17.88	9	49.4	4	20.65	27	67.1	10
une 9.1	10.91	12	59.2	14	34.98	8	80.6	3	17.81	7	50.0	6	20.41	24	65.6	15
19.1	10.82	9	57.5	17	34.94	4	80.2	4	17.77	4	50.5	5	20.21	20	63.7	19
29.1	10.76	6	55.5	20	34.93	1	79.7	5	17.76	1	51.0	5	20.06	15	61.4	23
uly 9.1	10.73	3	53.3	22	34.95	2	79.1	6	17.78	2	51.5	5	19.95	11	58.9	25
19.0	10.74	1	51.0	23	35.01	6	78.3	8	17.83	5	52.0	5	19.89	6	56.1	28
29.0	10.79	5	48.7	23	35.10	9	77.4	9	17.90	7	52.5	5	19.89	0	53.2	29
ug. 8.0	10.87	8	46.4	23	35.22	12	76.4	10	18.01	11	52.8	3	19.95	6	50.3	29
18.0	10.99	12	44.2	22	35.38	16	75.4	10	18.14	13	53.0	2	20.06	11	47.4	29
27.9	11.15	16	42.1	21	35.57	19	74.2	12	18.30	16	53.1	1	20.24	18	44.7	27
Sept. 6.9	11.34	19	40.4	17	35.78	21	72.9	13	18.49	19	53.0	1	20.47	23	42.3	24
16.9	11.56	22	39.0	14	36.03	25	71.6	13	18.71	22	52.7	3	20.75	28	40.2	21
26.8	11.82	26	38.0	10	36.30	27	70.2	14	18.95	24	52.1	6	21.08	33	38.6	16
Oct. 6.8	12.11	29	37.5	5	36.60	30	68.7	15	19.21	26	51.3	8	21.46	38	37.6	10
16.8	12.43	32	37.5	0	36.92	32	67.2	15	19.50	29	50.3	10	21.87	41	37.1	5
26.8	12.76	33	38.1	6	37.26	34	65.8	14	19.80	30	49.0	13	22.31	44	37.3	2
Nov. 5.7	13.11	35	39.2	11	37.62	36	64.3	15	20.12	32	47.6	14	22.77	46	38.1	8
15.7	13.46	35	40.9	17	37.99	37	62.9	14	20.44	32	46.0	16	23.23	46	39.5	14
25.7	13.80	34	43.0	21	38.35	36	61.7	12	20.77	33	44.3	17	23.67	44	41.6	21
Dec. 5.7	14.13	33	45.6	26	38.71	36	60.6	11	21.09	32	42.5	18	24.09	42	44.2	26
15.6	14.44	31	48.5	29	39.05	34	59.7	9	21.38	29	40.7	18	24.47	38	47.2	30
25.6	14.71	27	51.6	31	39.36	31	59.1	6	21.66	28	39.0	17	24.79	32	50.6	34
35.6	14.94	23	54.8	32	39.63	27	58.8	3	21.90	24	37.4	16	25.05	26	54.3	37
ec δ, Tan δ	1.191		−0.646		1.144		+0.556		1.007		+0.118		1.718		−1.397	
ean Place	10ˢ.562		45″.90		33ˢ.460		77″.68		16ˢ.581		53″.13		21ˢ.198		48″.19	
Dψα, Dωα	−0.01		−0.03		+0.01		+0.02		0.00		+0.01		−0.03		−0.06	
Dψδ, Dωδ	−0.3		+0.8		−0.3		+0.8		−0.3		+0.8		−0.3		+0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ² Cancri (*mean*). Mag. 5.5				ζ Hydræ. Mag. 3.3				ι Ursæ Majoris. Mag. 3.1				α Cancri. Mag. 4.3			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Decli- tion N.	
	h m		° ′		h m		° ′		h m		° ′		h m		°	
	8 49		+30 53		8 50		+ 6 15		8 53		+48 22		8 53		+12	
	s		″		s		″		s		″		s		″	
Jan. 0.6	5.94		63.6		55.91		71.3		26.54		27.6		52.24		73.6	
		26		1		22		15		31		8		23		
10.6	6.20		63.5		56.13		69.8		26.85		28.4		52.47		72.4	
		20		1		18		14		25		11		19		
20.5	6.40		63.6		56.31		68.4		27.10		29.5		52.66		71.4	
		15		4		12		11		18		14		13		
30.5	6.55		64.0		56.43		67.3		27.28		30.9		52.79		70.6	
		9		6		8		10		11		16		8		
Feb. 9.5	6.64		64.6		56.51		66.3		27.39		32.5		52.87		70.0	
		3		8		2		7		3		17		3		
19.5	6.67		65.4		56.53		65.6		27.42		34.2		52.90		69.7	
		3		9		2		5		4		18		1		
Mar. 1.4	6.64		66.3		56.51		65.1		27.38		36.0		52.89		69.5	
		7		9		6		3		10		17		6		
11.4	6.57		67.2		56.45		64.8		27.28		37.7		52.83		69.5	
		11		9		9		1		15		15		9		
21.4	6.46		68.1		56.36		64.7		27.13		39.2		52.74		69.7	
		14		8		12		0		20		14		12		
31.3	6.32		68.9		56.24		64.7		26.93		40.6		52.62		69.9	
		16		8		13		2		22		11		14		
Apr. 10.3	6.16		69.7		56.11		64.9		26.71		41.7		52.48		70.2	
		17		6		14		2		23		8		14		
20.3	5.99		70.3		55.97		65.1		26.48		42.5		52.34		70.5	
		16		5		14		3		23		4		14		
30.3	5.83		70.8		55.83		65.4		26.25		42.9		52.20		70.9	
		16		2		13		4		22		2		13		
May 10.2	5.67		71.0		55.70		65.8		26.03		43.1		52.07		71.3	
		13		1		12		4		21		2		11		
20.2	5.54		71.1		55.58		66.2		25.82		42.9		51.96		71.7	
		12		1		9		5		17		6		10		
30.2	5.42		71.0		55.49		66.7		25.65		42.3		51.86		72.0	
		8		3		7		6		14		9		7		
June 9.2	5.34		70.7		55.42		67.3		25.51		41.4		51.79		72.4	
		6		4		5		5		9		11		5		
19.1	5.28		70.3		55.37		67.8		25.42		40.3		51.74		72.7	
		2		6		1		5		5		14		1		
29.1	5.26		69.7		55.36		68.3		25.37		38.9		51.73		73.0	
		2		8		1		6		1		17		1		
July 9.1	5.28		68.9		55.37		68.9		25.36		37.2		51.74		73.2	
		5		9		4		5		4		18		4		
19.0	5.33		68.0		55.41		69.4		25.40		35.4		51.78		73.4	
		8		10		7		4		8		20		7		
29.0	5.41		67.0		55.48		69.8		25.48		33.4		51.85		73.5	
		12		11		10		4		13		20		10		
Aug. 8.0	5.53		65.9		55.58		70.2		25.61		31.4		51.95		73.5	
		15		12		12		2		17		22		13		
18.0	5.68		64.7		55.70		70.4		25.78		29.2		52.08		73.3	
		18		13		16		0		22		22		15		
27.9	5.86		63.4		55.86		70.4		26.00		27.0		52.23		73.1	
		22		14		18		1		26		22		18		
Sept. 6.9	6.08		62.0		56.04		70.3		26.26		24.8		52.41		72.6	
		24		14		20		3		29		22		21		
16.9	6.32		60.6		56.24		70.0		26.55		22.6		52.62		72.0	
		27		15		24		5		33		22		24		
26.9	6.59		59.1		56.48		69.5		26.88		20.4		52.86		71.2	
		30		16		26		8		37		20		26		
Oct. 6.8	6.89		57.5		56.74		68.7		27.25		18.4		53.12		70.2	
		32		16		28		10		40		19		29		
16.8	7.21		55.9		57.02		67.7		27.65		16.5		53.41		69.0	
		35		15		30		13		42		17		30		14
26.8	7.56		54.4		57.32		66.4		28.07		14.8		53.71		67.6	
		36		15		31		15		44		15		33		15
Nov. 5.7	7.92		52.9		57.63		64.9		28.51		13.3		54.04		66.1	
		37		15		33		16		46		12		33		16
15.7	8.29		51.4		57.96		63.3		28.97		12.1		54.37		64.5	
		37		12		33		18		46		9		33		17
25.7	8.66		50.2		58.29		61.5		29.43		11.2		54.70		62.8	
		37		11		32		18		45		6		33		16
Dec. 5.7	9.03		49.1		58.61		59.7		29.88		10.6		55.03		61.2	
		35		8		30		18		43		2		31		16
15.6	9.38		48.3		58.91		57.9		30.31		10.4		55.34		59.6	
		32		6		28		17		39		2		29		15
25.6	9.70		47.7		59.19		56.2		30.70		10.6		55.63		58.1	
		28		3		24		17		35		6		25		14
35.6	9.98		47.4		59.43		54.5		31.05		11.2		55.88		56.7	
Sec δ, Tan δ	1.165		+0.598		1.006		+0.110		1.505		+1.125		1.023		+0.216	
Mean Place	3ˢ.755		67″.52		54ˢ.154		71″.00		23ˢ.714		34″.26		50ˢ.424		74″.60	
D′ψ α, Dω α	+0.01		+0.03		0.00		0.00		+0.02		+0.05		0.00		+0.01	
Dψ δ, Dω δ	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	b^1 Carinæ. Mag. 5.1				κ Ursæ Majoris. Mag. 3.7				σ^2 Ursæ Majoris. Mag. 4.9				κ Cancri. Mag. 5.1			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	8 54		−58 53		8 57		+47 29		9 2		+67 28		9 3		+11 0	
	s		″		s		″		s		″		s		″	
Jan. 0.6	55.44		51.9		52.54		29.6		60.66		41.1		10.49		38.1	
10.6	55.69	25	55.6	37	52.85	31	30.3	7	61.15	49	42.8	17	10.73	24	36.8	13
20.5	55.86	17	59.5	39	53.11	26	31.4	11	61.54	39	44.8	20	10.92	19	35.7	11
30.5	55.94	8	63.4	39	53.29	18	32.7	13	61.82	28	47.0	22	11.06	14	34.8	9
Feb. 9.5	55.94	0	67.2	38	53.40	11	34.2	15	61.98	16	49.5	25	11.15	9	34.1	7
19.5	55.86	8	70.8	36	53.44	4	35.9	17	62.01	3	52.1	26	11.19	4	33.6	5
Mar. 1.4	55.71	15	74.1	33	53.41	3	37.6	17	61.93	8	54.6	25	11.18	1	33.4	2
11.4	55.49	22	77.1	30	53.32	9	39.3	17	61.74	19	57.0	24	11.13	5	33.3	1
21.4	55.22	27	79.7	26	53.18	14	40.9	16	61.46	28	59.1	21	11.05	8	33.4	1
31.4	54.90	32	81.9	22	52.99	19	42.3	14	61.10	36	60.9	18	10.94	11	33.6	2
Apr. 10.3	54.55	35	83.6	17	52.78	21	43.4	11	60.69	41	62.3	14	10.81	13	33.9	3
20.3	54.19	36	84.8	12	52.56	22	44.2	8	60.24	45	63.3	10	10.67	14	34.3	4
30.3	53.82	37	85.5	7	52.33	23	44.7	5	59.79	45	63.8	5	10.53	14	34.6	3
May 10.2	53.45	37	85.7	2	52.11	22	44.9	2	59.34	45	63.8	0	10.40	13	35.1	5
20.2	53.10	35	85.4	3	51.92	19	44.8	1	58.92	42	63.3	5	10.29	11	35.5	4
30.2	52.78	32	84.5	9	51.75	17	44.3	5	58.55	37	62.3	10	10.19	10	35.9	4
June 9.2	52.48	30	83.2	13	51.61	14	43.5	8	58.23	32	60.9	14	10.11	8	36.3	4
19.1	52.23	25	81.4	18	51.51	10	42.4	11	57.98	25	59.1	18	10.06	5	36.6	3
29.1	52.02	21	79.3	21	51.46	5	41.0	14	57.80	18	57.0	21	10.04	2	36.9	3
July 9.1	51.87	15	76.8	25	51.45	1	39.5	15	57.70	10	54.5	25	10.04	0	37.2	3
19.1	51.77	10	74.0	28	51.48	3	37.7	18	57.69	1	51.9	26	10.07	3	37.4	2
29.0	51.73	4	71.1	29	51.56	8	35.8	19	57.75	6	49.0	29	10.13	6	37.6	2
Aug. 8.0	51.76	3	68.2	29	51.69	13	33.8	20	57.90	15	46.1	29	10.22	9	37.6	0
18.0	51.86	10	65.2	30	51.85	16	31.6	22	58.12	22	43.1	30	10.34	12	37.5	1
27.9	52.02	16	62.4	28	52.06	21	29.4	22	58.43	31	40.1	30	10.48	14	37.3	2
Sept. 6.9	52.25	23	59.8	26	52.31	25	27.2	22	58.81	38	37.1	30	10.66	18	36.9	4
16.9	52.54	29	57.6	22	52.59	28	25.1	21	59.26	45	34.2	29	10.86	20	36.3	6
26.9	52.89	35	55.8	18	52.91	32	22.9	22	59.78	52	31.5	27	11.09	23	35.5	8
Oct. 6.8	53.30	41	54.5	13	53.27	36	20.8	21	60.36	58	29.1	24	11.34	25	34.6	9
16.8	53.75	45	53.8	7	53.66	39	18.9	19	60.99	63	26.9	22	11.62	28	33.4	12
26.8	54.23	48	53.7	1	54.08	42	17.1	18	61.67	68	25.1	18	11.92	30	32.0	14
Nov. 5.8	54.73	50	54.3	6	54.51	43	15.6	15	62.38	71	23.6	15	12.24	32	30.5	15
15.7	55.23	50	55.6	13	54.96	45	14.3	13	63.11	73	22.6	10	12.57	33	28.8	17
25.7	55.72	49	57.4	18	55.42	46	13.3	10	63.84	73	22.0	6	12.90	33	27.0	18
Dec. 5.7	56.19	47	59.9	25	55.86	44	12.7	6	64.55	71	21.9	1	13.23	33	25.3	17
15.6	56.62	43	62.8	29	56.29	43	12.4	3	65.23	68	22.3	4	13.55	32	23.6	17
25.6	56.99	37	66.1	33	56.68	39	12.6	2	65.86	63	23.3	10	13.84	29	22.0	16
35.6	57.29	30	69.7	36	57.03	35	13.1	5	66.41	55	24.6	13	14.10	26	20.6	14
Sec δ, Tan δ	1.936		−1.658		1.480		+1.091		2.610		+2.412		1.019		+0.195	
Mean Place	$53^s.563$		63″.91		$49^s.777$		36″.53		$56^s.001$		50″.38		$8^s.719$		39″.25	
$D'_\psi \alpha$, $D_\omega \alpha$	−0.03		−0.08		+0.02		+0.05		+0.04		+0.12		0.00		+0.01	
$D_\psi \delta$, $D_\omega \delta$	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**λ Argûs.** Mag. 2.2				**θ Hydræ.** Mag. 3.8				**β Argûs.** Mag. 1.8				**83 Cancri.** Mag. 6.6		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decl tion
	h m		° ′		h m		° ′		h m		° ′		h m		
	9 4		−43 5		9 9		+ 2 40		9 12		−69 21		9 14		+18
	s		″		s		″		s		″		s		″
Jan. 0.6	53.69		11.0		58.26		25.0		18.49		47.4		16.26		55.
10.6	53.93	24	14.5	35	58.50	24	23.2	18	18.84	35	51.1	37	16.51	25	54.
20.6	54.10	17	18.1	36	58.69	19	21.6	16	19.08	24	55.0	39	16.72	21	53.
30.5	54.22	12	21.6	35	58.83	14	20.2	14	19.20	12	59.0	40	16.88	16	53.
Feb. 9.5	54.27	5	25.0	34	58.93	10	19.0	12	19.21	1	62.9	39	16.99	11	53.
19.5	54.26	1	28.3	33	58.97	4	18.0	10	19.10	11	66.7	38	17.04	5	53.
Mar. 1.4	54.19	7	31.3	30	58.97	0	17.3	7	18.88	22	70.3	36	17.05	1	53.
11.4	54.08	11	33.9	26	58.92	5	16.8	5	18.57	31	73.7	34	17.01	4	53.
21.4	53.92	16	36.2	23	58.84	8	16.5	3	18.18	39	76.7	30	16.93	8	53.
31.4	53.73	19	38.0	18	58.73	11	16.3	2	17.72	46	79.3	26	16.82	11	54.
Apr. 10.3	53.52	21	39.4	14	58.61	12	16.3	0	17.20	52	81.4	21	16.69	13	54.
20.3	53.29	23	40.4	10	58.48	13	16.5	2	16.65	55	83.0	16	16.55	14	55.
30.3	53.06	23	40.9	5	58.35	13	16.8	3	16.09	56	84.1	11	16.41	14	55.
May 10.3	52.83	23	41.0	1	58.22	13	17.1	3	15.52	57	84.7	6	16.27	14	56.
20.2	52.62	21	40.6	4	58.10	12	17.6	5	14.95	57	84.8	1	16.15	12	56.
30.2	52.42	20	39.8	8	58.00	10	18.1	5	14.41	54	84.3	5	16.04	11	57.
June 9.2	52.25	17	38.5	13	57.92	8	18.7	6	13.91	50	83.3	10	15.96	8	57.
19.1	52.11	14	36.9	16	57.86	6	19.4	7	13.46	45	81.8	15	15.90	6	57.
29.1	51.99	12	34.9	20	57.83	3	20.0	6	13.07	39	79.8	20	15.87	3	57.
July 9.1	51.92	7	32.7	22	57.83	0	20.7	7	12.75	32	77.5	23	15.87	0	57.
19.1	51.88	4	30.3	24	57.85	2	21.3	6	12.51	24	74.9	26	15.89	2	57.1
29.0	51.88	0	27.7	26	57.90	5	21.9	6	12.36	15	72.0	29	15.94	5	56.8
Aug. 8.0	51.93	5	25.1	26	57.98	8	22.4	5	12.31	5	69.0	30	16.02	8	56.4
18.0	52.01	8	22.5	26	58.08	10	22.8	4	12.36	5	65.9	31	16.13	11	55.9
28.0	52.14	13	20.1	24	58.22	14	23.0	2	12.51	15	62.9	30	16.27	14	55.2
Sept. 6.9	52.32	18	17.9	22	58.38	16	23.1	1	12.77	26	60.1	28	16.44	17	54.4
16.9	52.54	22	16.1	18	58.57	19	22.9	2	13.12	35	57.6	25	16.64	20	53.4
26.9	52.80	26	14.6	15	58.79	22	22.4	5	13.57	45	55.4	22	16.87	23	52.3
Oct. 6.8	53.11	31	13.7	9	59.04	25	21.7	7	14.11	54	53.8	16	17.12	25	50.9
16.8	53.44	33	13.3	4	59.31	27	20.7	10	14.71	60	52.7	11	17.40	28	49.5
26.8	53.80	36	13.4	1	59.60	29	19.5	12	15.36	65	52.2	5	17.71	31	47.9
Nov. 5.8	54.19	39	14.2	8	59.91	31	18.0	15	16.05	69	52.4	2	18.03	32	46.3
15.7	54.58	39	15.6	14	60.23	32	16.3	17	16.75	70	53.2	8	18.37	34	44.6
25.7	54.97	39	17.5	19	60.56	33	14.5	18	17.44	69	54.8	16	18.71	34	42.9
Dec. 5.7	55.34	37	19.9	24	60.88	32	12.5	20	18.09	65	56.9	21	19.05	34	41.3
15.6	55.69	35	22.8	29	61.20	32	10.5	20	18.69	60	59.6	27	19.38	33	39.8
25.6	56.01	32	25.9	31	61.49	29	8.5	20	19.20	51	62.7	31	19.69	31	38.4
35.6	56.28	27	29.4	35	61.74	25	6.7	18	19.62	42	66.2	35	19.97	28	37.3
Sec δ, Tan δ	1.369		−0.935		1.001		+0.047		2.838		−2.656		1.052		+0.326
Mean Place	$52^{\mathrm{s}}.138$		20″.84		$56^{\mathrm{s}}.613$		24″.73		$16^{\mathrm{s}}.325$		61″.19		$14^{\mathrm{s}}.425$		58″.66
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.02		−0.04		0.00		0.00		−0.05		−0.13		+0.01		+0.02
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ι Argûs.** Mag. 2.2				**40 Lyncis.** Mag. 3.3				**θ Pyxidis.** Mag. 4.9				**α Hydræ.** Mag. 2.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 9 14		° ′ −58 54		h m 9 15		° ′ +34 44		h m 9 17		° ′ −25 36		h m 9 23		° ′ − 8 17	
	s		″		s		″		s		″		s		″	
an. 0.6	50.50		52.9		55.07		63.1		45.03		6.4		26.16		20.0	
10.6	50.78	28	56.6	37	55.36	29	63.0	1	45.27	24	9.4	30	26.40	24	22.3	23
20.6	50.99	21	60.4	38	55.60	24	63.3	3	45.46	19	12.4	30	26.60	20	24.6	23
30.5	51.12	13	64.3	39	55.78	18	63.8	5	45.59	13	15.3	29	26.75	15	26.6	20
Feb. 9.5	51.16	4	68.1	38	55.90	12	64.6	8	45.68	9	18.1	28	26.85	10	28.5	19
19.5	51.13	3	71.8	37	55.96	6	65.5	9	45.71	3	20.7	26	26.90	5	30.1	16
Mar. 1.4	51.01	12	75.3	35	55.96	0	66.7	12	45.69	2	23.0	23	26.90	0	31.5	14
11.4	50.83	18	78.5	32	55.91	5	67.9	12	45.63	6	25.0	20	26.86	4	32.7	12
21.4	50.59	24	81.3	28	55.82	9	69.1	12	45.53	10	26.6	16	26.79	7	33.5	8
31.4	50.30	29	83.7	24	55.69	13	70.2	11	45.41	12	27.9	13	26.69	10	34.1	6
Apr. 10.3	49.98	32	85.6	19	55.54	15	71.2	10	45.26	15	28.9	10	26.57	12	34.5	4
20.3	49.63	35	87.1	15	55.37	17	72.0	8	45.10	16	29.6	7	26.44	13	34.7	2
30.3	49.28	35	88.1	10	55.20	17	72.7	7	44.94	16	29.8	2	26.30	14	34.6	1
May 10.3	48.92	36	88.5	4	55.03	17	73.1	4	44.78	16	29.8	0	26.17	13	34.3	3
20.2	48.57	35	88.4	1	54.88	15	73.3	2	44.63	15	29.3	5	26.05	12	33.9	4
30.2	48.24	33	87.8	6	54.74	14	73.2	1	44.49	14	28.6	7	25.94	11	33.3	6
June 9.2	47.94	30	86.7	11	54.63	11	73.0	2	44.38	11	27.6	10	25.85	9	32.5	8
19.1	47.67	27	85.2	15	54.55	8	72.5	5	44.29	9	26.3	13	25.78	7	31.5	10
29.1	47.44	23	83.2	20	54.51	4	71.8	7	44.22	7	24.7	16	25.73	5	30.5	10
July 9.1	47.26	18	80.9	23	54.49	2	70.9	9	44.18	4	23.0	17	25.71	2	29.4	11
19.1	47.14	12	78.3	26	54.51	2	69.8	11	44.17	1	21.1	19	25.71	0	28.3	11
29.0	47.07	7	75.5	28	54.56	5	68.6	12	44.18	1	19.2	19	25.74	3	27.1	12
Aug. 8.0	47.06	1	72.6	29	54.65	9	67.2	14	44.23	5	17.3	19	25.80	6	26.0	11
18.0	47.12	6	69.7	29	54.78	13	65.7	15	44.32	9	15.4	19	25.89	9	25.0	10
28.0	47.25	13	66.8	29	54.93	15	64.1	16	44.44	12	13.7	17	26.01	12	24.2	8
Sept. 6.9	47.45	20	64.1	27	55.12	19	62.4	17	44.59	15	12.2	15	26.15	14	23.6	6
16.9	47.71	26	61.8	23	55.34	22	60.6	18	44.77	18	10.9	13	26.33	18	23.2	4
26.9	48.04	33	59.8	20	55.60	26	58.7	19	44.99	22	10.1	8	26.53	20	23.1	1
Oct. 6.8	48.42	38	58.4	14	55.88	28	56.9	18	45.24	25	9.7	4	26.77	24	23.4	3
16.8	48.86	44	57.5	9	56.20	32	55.0	19	45.52	28	9.7	0	27.03	26	24.0	6
26.8	49.33	47	57.2	3	56.54	34	53.1	19	45.83	31	10.2	5	27.32	29	25.0	10
Nov. 5.8	49.83	50	57.5	3	56.91	37	51.4	17	46.16	33	11.3	11	27.63	31	26.3	13
.15.7	50.34	51	58.5	10	57.29	38	49.8	16	46.50	34	12.7	14	27.95	32	27.9	16
25.7	50.85	51	60.2	17	57.68	39	48.3	15	46.84	34	14.7	20	28.28	33	29.8	19
Dec. 5.7	51.33	48	62.4	22	58.06	38	47.1	12	47.18	34	17.0	23	28.60	32	32.0	22
15.7	51.78	45	65.2	28	58.43	37	46.2	9	47.50	32	19.6	26	28.92	32	34.2	22
25.6	52.18	40	68.4	32	58.78	35	45.6	6	47.80	30	22.4	28	29.21	29	36.6	24
35.6	52.52	34	71.9	35	59.10	32	45.3	3	48.06	26	25.4	30	29.47	26	39.0	24
Sec δ, Tan δ	1.937		−1.659		1.217		+0.694		1.109		−0.479		1.011		−0.146	
Mean Place	48^{s}.782		65″.45		52^{s}.878		69″.62		43^{s}.581		12″.89		24^{s}.653		22″.41	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.03		−0.08		+0.01		+0.03		−0.01		−0.02		0.00		−0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		+0.7		−0.3		+0.7		−0.3		+0.7		−0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*h* Ursæ Majoris. Mag. 3.8				*d* Ursæ Majoris. Mag. 4.6				*θ* Ursæ Majoris. Mag. 3.3				*ψ* Argûs. Mag. 3.6		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declina- tion S
	h m 9 24		° ′ +63 25		h m 9 26		° ′ +70 11		h m 9 27		° ′ +52 3		h m 9 27		° −40
	s		″		s		″		s		″		s		″
Jan. 0.6	54.53		52.4		64.45		65.6		13.72		45.6		22.38		30.5
10.6	55.01	48	53.7	13	65.05	60	67.1	15	14.09	37	46.3	7	22.64	26	33.9
20.6	55.40	39	55.4	17	65.54	49	69.1	20	14.40	31	47.4	11	22.84	20	37.3
30.5	55.69	29	57.4	20	65.90	36	71.4	23	14.64	24	48.8	14	22.99	15	40.8
Feb. 9.5	55.88	19	59.7	23	66.13	23	73.9	25	14.79	15	50.5	17	23.07	8	44.2
19.5	55.97	9	62.1	24	66.22	9	76.5	26	14.87	8	52.4	19	23.10	3	47.4
Mar. 1.5	55.95	2	64.5	24	66.18	4	79.2	27	14.87	0	54.4	20	23.07	3	50.4
11.4	55.84	11	66.9	24	66.02	16	81.8	26	14.81	6	56.4	20	22.99	8	53.0
21.4	55.64	20	69.1	22	65.74	28	84.2	24	14.68	13	58.3	19	22.87	12	55.4
31.4	55.37	27	71.1	20	65.37	37	86.3	21	14.50	18	60.0	17	22.71	16	57.3
Apr. 10.3	55.05	32	72.7	16	64.92	45	87.9	16	14.28	22	61.4	14	22.53	18	58.8
20.3	54.69	36	73.9	12	64.43	49	89.2	13	14.04	24	62.6	12	22.34	19	59.9
30.3	54.32	37	74.6	7	63.92	51	90.0	8	13.79	25	63.4	8	22.13	21	60.6
May 10.3	53.95	37	74.9	3	63.40	52	90.2	2	13.54	25	63.8	4	21.93	20	60.9
20.2	53.59	36	74.8	1	62.90	50	89.9	3	13.30	24	63.8	0	21.73	20	60.7
30.2	53.26	33	74.2	6	62.44	46	89.2	7	13.08	22	63.5	3	21.54	19	60.1
June 9.2	52.98	28	73.1	11	62.03	41	87.9	13	12.90	18	62.7	8	21.38	16	59.0
19.2	52.75	23	71.6	15	61.68	35	86.3	16	12.75	15	61.7	10	21.24	14	57.6
29.1	52.57	18	69.8	18	61.41	27	84.2	21	12.64	11	60.3	14	21.12	12	55.9
July 9.1	52.46	11	67.6	22	61.22	19	81.8	24	12.57	7	58.6	17	21.03	9	53.9
19.1	52.42	4	65.2	24	61.12	10	79.1	27	12.56	1	56.7	19	20.98	5	51.7
29.0	52.44	2	62.5	27	61.11	1	76.2	29	12.59	3	54.5	22	20.97	1	49.3
Aug. 8.0	52.52	8	59.7	28	61.19	8	73.1	31	12.67	8	52.2	23	20.99	2	46.8
18.0	52.68	16	56.8	29	61.37	18	70.0	31	12.79	12	49.7	25	21.05	6	44.4
28.0	52.90	22	53.8	30	61.63	26	66.8	32	12.96	17	47.2	25	21.16	11	42.1
Sept. 6.9	53.19	29	50.9	29	61.98	35	63.6	32	13.18	22	44.6	26	21.30	14	39.9
16.9	53.54	35	47.9	30	62.42	44	60.5	31	13.44	26	42.0	26	21.49	19	38.1
26.9	53.95	41	45.1	28	62.93	51	57.5	30	13.75	31	39.5	25	21.73	24	36.6
Oct. 6.9	54.41	46	42.5	26	63.53	60	54.7	28	14.10	35	37.0	25	22.00	27	35.6
16.8	54.93	52	40.1	24	64.19	66	52.2	25	14.49	39	34.7	23	22.31	31	35.1
26.8	55.49	56	37.9	22	64.90	71	50.1	21	14.91	42	32.5	22	22.65	34	35.2
Nov. 5.8	56.09	60	36.1	18	65.67	77	48.3	18	15.36	45	30.6	19	23.02	37	35.8
15.7	56.72	63	34.7	14	66.47	80	46.9	14	15.84	48	29.1	15	23.40	38	37.0
25.7	57.36	64	33.7	10	67.28	81	46.1	8	16.33	49	27.8	13	23.78	38	38.8
Dec. 5.7	57.99	63	33.2	5	68.08	80	45.7	4	16.81	48	26.9	9	24.16	38	41.0
15.7	58.61	62	33.2	0	68.85	77	45.9	2	17.28	47	26.5	4	24.52	36	43.7
25.6	59.18	57	33.7	5	69.58	73	46.6	7	17.72	44	26.5	0	24.85	33	46.8
35.6	59.69	51	34.7	10	70.22	64	47.9	13	18.12	40	26.9	4	25.13	28	50.0
Sec δ, Tan δ	2.235		+2.000		2.953		+2.778		1.627		+1.283		1.307		−0.84
Mean Place	50ˢ.659		63″.55		59ˢ.460		77″.40		10ˢ.855		55″.70		20ˢ.963		40″.03
D′ψ α, Dω α	+0.03		+0.10		+0.05		+0.15		+0.02		+0.07		−0.01		−0.04
Dψ δ, Dω δ	−0.3		+0.6		−0.3		+0.6		−0.3		+0.6		−0.3		+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	ξ Leonis. Mag. 5.1				10 Leonis Minoris. Mag. 4.6				ζ Chamæleontis. Mag. 5.2				o Leonis. Mag. 3.8			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 27		+11 40		9 29		+36 46		9 36		−80 33		9 36		+10 16	
	s		″		s		″		s		″		s		″	
n. 0.6	23.66	26	34.1	14	3.48	30	24.4	0	28.84	76	19.0	34	38.59	26	44.2	14
10.6	23.92	21	32.7	12	3.78	26	24.4	3	29.60	53	22.4	37	38.85	22	42.8	13
20.6	24.13	17	31.5	9	4.04	20	24.7	6	30.13	29	26.1	39	39.07	18	41.5	10
30.5	24.30	12	30.6	6	4.24	14	25.3	8	30.42	6	30.0	40	39.25	12	40.5	8
eb. 9.5	24.42	6	30.0	5	4.38	8	26.1	11	30.48	18	34.0	39	39.37	8	39.7	6
19.5	24.48	2	29.5	2	4.46	2	27.2	13	30.30	40	37.9	38	39.45	2	39.1	3
ar. 1.5	24.50	3	29.3	0	4.48	4	28.5	13	29.90	60	41.7	37	39.47	2	38.8	1
11.4	24.47	7	29.3	1	4.44	9	29.8	13	29.30	79	45.4	33	39.45	6	38.7	1
21.4	24.40	9	29.4	3	4.35	12	31.1	13	28.51	94	48.7	30	39.39	8	38.8	2
31.4	24.31	12	29.7	3	4.23	15	32.4	11	27.57	107	51.7	26	39.31	11	39.0	3
pr. 10.3	24.19	13	30.0	4	4.08	17	33.5	10	26.50	118	54.3	21	39.20	13	39.3	4
20.3	24.06	13	30.4	5	3.91	17	34.5	7	25.32	124	56.4	17	39.07	12	39.7	4
30.3	23.93	13	30.9	4	3.74	17	35.2	5	24.08	129	58.1	12	38.95	13	40.1	5
ay 10.3	23.80	12	31.3	4	3.57	16	35.7	3	22.79	130	59.3	6	38.82	12	40.6	4
20.2	23.68	10	31.7	5	3.41	15	36.0	0	21.49	128	59.9	0	38.70	11	41.0	5
30.2	23.58	9	32.2	4	3.26	12	36.0	2	20.21	123	59.9	5	38.59	9	41.5	4
une 9.2	23.49	6	32.6	3	3.14	9	35.8	5	18.98	115	59.4	10	38.50	7	41.9	4
19.2	23.43	4	32.9	3	3.05	6	35.3	8	17.83	105	58.4	15	38.43	4	42.3	4
29.1	23.39	2	33.2	2	2.99	3	34.5	10	16.78	91	56.9	19	38.39	2	42.7	2
uly 9.1	23.37	1	33.4	2	2.96	0	33.5	11	15.87	74	55.0	24	38.37	0	42.9	3
19.1	23.38	4	33.6	1	2.96	4	32.4	13	15.13	55	52.6	26	38.37	3	43.2	1
29.0	23.42	7	33.7	1	3.00	7	31.1.	15	14.58	35	50.0	29	38.40	5	43.3	0
ug. 8.0	23.49	9	33.6	2	3.07	11	29.6	17	14.23	13	47.1	30	38.45	9	43.3	1
18.0	23.58	12	33.4	3	3.18	14	27.9	18	14.10	10	44.1	30	38.54	11	43.2	2
28.0	23.70	15	33.1	5	3.32	18	26.1	18	14.20	34	41.1	30	38.65	14	43.0	5
ept. 6.9	23.85	18	32.6	7	3.50	21	24.3	20	14.54	57	38.1	28	38.79	17	42.5	6
16.9	24.03	21	31.9	9	3.71	25	22.3	20	15.11	78	35.3	24	38.96	20	41.9	9
26.9	24.24	24	31.0	11	3.96	28	20.3	20	15.89	98	32.9	21	39.16	23	41.0	10
Oct. 6.9	24.48	27	29.9	13	4.24	32	18.3	21	16.87	115	30.8	15	39.39	26	40.0	13
16.8	24.75	29	28.6	15	4.56	34	16.2	19	18.02	127	29.3	10	39.65	28	38.7	15
26.8	25.04	31	27.1	16	4.90	37	14.3	19	19.29	137	28.3	4	39.93	31	37.2	16
Nov. 5.8	25.35	32	25.5	17	5.27	38	12.4	18	20.66	141	27.9	3	40.24	33	35.6	18
15.7	25.67	34	23.8	19	5.65	40	10.6	15	22.07	139	28.2	10	40.57	33	33.8	19
25.7	26.01	34	21.9	18	6.05	40	9.1	13	23.46	134	29.2	16	40.90	34	31.9	19
Dec. 5.7	26.35	32	20.1	18	6.45	38	7.8	9	24.80	123	30.8	23	41.24	32	30.0	18
15.7	26.67	31	18.3	17	6.83	36	6.9	7	26.03	108	33.1	27	41.56	31	28.2	18
25.6	26.98	28	16.6	15	7.19	33	6.2	3	27.11	89	35.8	32	41.87	29	26.4	16
35.6	27.26		15.1		7.52		5.9		28.00		39.0		42.16		24.8	
ec δ, Tan δ	1.021		+0.207		1.248		+0.747		6.097		−6.015		1.016		+0.181	
ean Place	21ˢ.973		36″.59		1ˢ.282		32″.30		25ˢ.656		34″.39		36ˢ.960		46″.82	
ψ α, Dω α	0.00		+0.01		+0.01		+0.04		−0.09		−0.32		0.00		+0.01	
Dψ δ, Dω δ	−0.3		+0.6		−0.3		+0.6		−0.3		+0.6		−0.3		+0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Antliæ. Mag. 5.0				ε Leonis. Mag. 3.1				υ Ursæ Majoris. Mag. 3.9				υ Argûs. Mag. 3.2		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Decli- tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	9 40		−27 22		9 41		+24 9		9 44		+59 25		9 44		−64
	s		″		s		″		s		″		s		″
Jan. 0.6	26.08		40.7		3.60		51.9		60.74		68.6		60.27		25.3
10.6	26.33	25	43.7	30	3.89	29	51.1	8	61.19	45	69.5	9	60.65	38	28.9
20.6	26.55	22	46.8	31	4.13	24	50.6	5	61.58	39	70.9	14	60.95	30	32.6
30.5	26.71	16	49.8	30	4.32	19	50.4	2	61.88	30	72.6	17	61.15	20	36.5
Feb. 9.5	26.82	11	52.7	29	4.46	14	50.5	1	62.09	21	74.6	20	61.26	11	40.5
19.5	26.88	6	55.4	27	4.55	9	50.8	3	62.20	11	76.8	22	61.27	1	44.4
Mar. 1.5	26.88	0	57.8	24	4.58	3	51.3	5	62.23	3	79.1	23	61.19	8	48.1
11.4	26.84	4	60.0	22	4.56	2	52.0	7	62.17	6	81.5	24	61.03	16	51.6
21.4	26.76	8	61.9	19	4.51	5	52.8	8	62.03	14	83.7	22	60.79	24	54.8
31.4	26.65	11	63.4	15	4.41	10	53.6	8	61.82	21	85.7	20	60.49	30	57.6
Apr. 10.4	26.52	13	64.5	11	4.29	12	54.5	9	61.57	25	87.4	17	60.14	35	60.1
20.3	26.37	15	65.4	9	4.16	13	55.2	7	61.28	29	88.8	14	59.75	39	62.0
30.3	26.22	15	65.8	4	4.02	14	55.9	7	60.97	31	89.8	10	59.33	42	63.5
May 10.3	26.06	16	65.9	1	3.87	15	56.5	6	60.65	32	90.4	6	58.90	43	64.4
20.2	25.91	15	65.7	2	3.74	13	56.9	4	60.34	31	90.5	1	58.47	43	64.8
30.2	25.77	14	65.2	5	3.62	12	57.2	3	60.06	28	90.2	3	58.05	42	64.7
June 9.2	25.64	13	64.3	9	3.52	10	57.3	1	59.80	26	89.4	8	57.65	40	64.1
19.2	25.54	10	63.1	12	3.44	8	57.3	0	59.58	22	88.3	11	57.28	37	63.0
29.1	25.45	9	61.7	14	3.39	5	57.1	2	59.41	17	86.7	16	56.95	33	61.4
July 9.1	25.39	6	60.0	17	3.36	3	56.8	3	59.29	12	84.8	19	56.67	28	59.4
19.1	25.36	3	58.2	18	3.36	0	56.3	5	59.22	7	82.6	22	56.44	23	57.0
29.1	25.36	0	56.3	19	3.38	2	55.7	6	59.21	1	80.2	24	56.28	16	54.4
Aug. 8.0	25.38	2	54.4	19	3.44	6	54.9	8	59.25	4	77.6	26	56.20	8	51.5
18.0	25.44	6	52.5	19	3.53	9	54.0	9	59.35	10	74.8	28	56.19	1	48.5
28.0	25.53	9	50.7	18	3.65	12	52.9	11	59.51	16	71.9	29	56.26	7	45.6
Sept. 6.9	25.66	13	49.1	16	3.79	14	51.6	13	59.73	22	68.9	30	56.42	16	42.7
16.9	25.83	17	47.7	14	3.97	18	50.2	14	60.00	27	66.0	29	56.67	25	40.1
26.9	26.03	20	46.7	10	4.18	21	48.7	15	60.33	33	63.1	29	57.00	33	37.8
Oct. 6.9	26.27	24	46.1	6	4.42	24	47.0	17	60.71	38	60.3	28	57.40	40	35.9
16.8	26.54	27	46.0	1	4.69	27	45.3	17	61.15	44	57.7	26	57.88	48	34.6
26.8	26.84	30	46.3	3	4.99	30	43.4	19	61.63	48	55.3	24	58.41	53	33.8
Nov. 5.8	27.16	32	47.2	9	5.32	33	41.6	18	62.14	51	53.2	21	58.98	57	33.7
15.8	27.50	34	48.5	13	5.67	35	39.7	19	62.69	55	51.5	17	59.58	60	34.2
25.7	27.86	36	50.3	18	6.02	35	37.9	18	63.26	57	50.2	13	60.19	61	35.4
Dec. 5.7	28.21	35	52.5	22	6.38	36	36.3	16	63.83	57	49.3	9	60.78	59	37.2
15.7	28.54	33	55.0	25	6.73	35	34.8	15	64.39	56	48.9	4	61.34	56	39.6
25.6	28.86	32	57.8	28	7.07	34	33.5	13	64.92	53	49.0	1	61.85	51	42.6
35.6	29.14	28	60.8	30	7.37	30	32.6	9	65.40	48	49.5	5	62.28	43	45.9
Sec δ, Tan δ	1.126		−0.518		1.096		+0.449		1.967		+1.693		2.338		−2.11
Mean Place	24^{s}.734		47″.43		1^{s}.771		58″.02		57^{s}.451		81″.17		58^{s}.688		39″.35
$D'_\psi\alpha$, $D_\omega\alpha$	−0.01		−0.03		+0.01		+0.02		+0.02		+0.09		−0.03		−0.12
$D_\psi\delta$, $D_\omega\delta$	−0.3		+0.6		−0.3		+0.6		−0.3		+0.6		−0.3		+0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**6 Sextantis.** Mag. 6.0				**μ Leonis.** Mag. 4.1				**Groombridge 1586.** Mag. 6.0				**19 Leonis Minoris.** Mag. 5.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	9 46		− 3 50		9 47		+26 24		9 50		+73 16		9 52		+41 27	
	s		″		s		″		s		″		s		″	
an. 0.6	58.53	26	39.4	22	57.76	30	21.2	7	54.22	74	49.5	14	31.25	35	29.3	0
10.6	58.79	22	41.6	20	58.06	25	20.5	4	54.96	61	50.9	19	31.60	29	29.3	4
20.6	59.01	18	43.6	19	58.31	20	20.1	1	55.57	48	52.8	22	31.89	24	29.7	7
30.6	59.19	12	45.5	17	58.51	15	20.0	1	56.05	33	55.0	26	32.13	17	30.4	11
eb. 9.5	59.31	8	47.2	14	58.66	9	20.1	5	56.38	17	57.6	27	32.30	11	31.5	13
19.5	59.39	3	48.6	12	58.75	4	20.6	7	56.55	2	60.3	28	32.41	5	32.8	15
ar. 1.5	59.42	2	49.8	9	58.79	1	21.3	8	56.57	14	63.1	28	32.46	2	34.3	16
11.4	59.40	5	50.7	7	58.78	5	22.1	9	56.43	27	65.9	26	32.44	7	35.9	16
21.4	59.35	8	51.4	4	58.73	9	23.0	9	56.16	39	68.5	23	32.37	11	37.5	15
31.4	59.27	10	51.8	3	58.64	12	23.9	10	55.77	49	70.8	19	32.26	15	39.0	15
pr. 10.4	59.17	11	52.1	0	58.52	13	24.9	8	55.28	56	72.7	15	32.11	17	40.5	12
20.3	59.06	13	52.1	1	58.39	14	25.7	8	54.72	60	74.2	11	31.94	18	41.7	10
30.3	58.93	12	52.0	3	58.25	15	26.5	6	54.12	63	75.3	5	31.76	19	42.7	7
ay 10.3	58.81	12	51.7	4	58.10	14	27.1	5	53.49	61	75.8	0	31.57	18	43.4	4
20.2	58.69	11	51.3	6	57.96	12	27.6	2	52.88	59	75.8	6	31.39	16	43.8	1
30.2	58.58	9	50.7	6	57.84	11	27.8	1	52.29	54	75.2	11	31.23	15	43.9	2
une 9.2	58.49	8	50.1	8	57.73	8	27.9	0	51.75	47	74.1	15	31.08	12	43.7	5
19.2	58.41	5	49.3	8	57.65	7	27.9	3	51.28	40	72.6	20	30.96	9	43.2	9
29.1	58.36	4	48.5	8	57.58	3	27.6	4	50.88	31	70.6	23	30.87	6	42.3	11
uly 9.1	58.32	1	47.7	9	57.55	1	27.2	6	50.57	21	68.3	27	30.81	3	41.2	13
19.1	58.31	2	46.8	9	57.54	2	26.6	8	50.36	11	65.6	29	30.78	0	39.9	15
29.1	58.33	4	45.9	8	57.56	5	25.8	9	50.25	0	62.7	32	30.78	4	38.4	18
ug. 8.0	58.37	6	45.1	7	57.61	8	24.9	11	50.25	10	59.5	33	30.82	8	36.6	19
18.0	58.43	10	44.4	5	57.69	11	23.8	12	50.35	21	56.2	34	30.90	12	34.7	21
28.0	58.53	12	43.9	4	57.80	14	22.6	14	50.56	31	52.8	34	31.02	16	32.6	22
ept. 6.9	58.65	16	43.5	1	57.94	17	21.2	15	50.87	42	49.4	34	31.18	19	30.4	23
16.9	58.81	18	43.4	2	58.11	20	19.7	17	51.29	52	46.0	32	31.37	23	28.1	23
26.9	58.99	22	43.6	4	58.31	24	18.0	18	51.81	62	42.8	30	31.60	27	25.8	24
ct. 6.9	59.21	25	44.0	7	58.55	27	16.2	19	52.43	70	39.8	28	31.87	31	23.4	23
16.8	59.46	27	44.7	11	58.82	31	14.3	19	53.13	78	37.0	25	32.18	34	21.1	23
26.8	59.73	30	45.8	14	59.13	32	12.4	19	53.91	84	34.5	21	32.52	37	18.8	21
ov. 5.8	60.03	32	47.2	17	59.45	35	10.5	19	54.75	89	32.4	17	32.89	40	16.7	19
15.8	60.35	33	48.9	19	59.80	36	8.6	18	55.64	92	30.7	11	33.29	42	14.8	17
25.7	60.68	33	50.8	21	60.16	36	6.8	17	56.56	93	29.6	6	33.71	42	13.1	14
Dec. 5.7	61.01	33	52.9	22	60.52	36	5.1	15	57.49	91	29.0	1	34.13	41	11.7	11
15.7	61.34	31	55.1	22	60.88	34	3.6	12	58.40	86	28.9	5	34.54	39	10.6	7
25.6	61.65	27	57.3	23	61.22	32	2.4	9	59.26	78	29.4	11	34.93	37	9.9	2
35.6	61.92		59.6		61.54		1.5		60.04		30.5		35.30		9.7	
c δ, Tan δ	1.002		−0.067		1.117		+0.497		3.476		+3.329		1.334		+0.884	
ean Place	57ˢ.087		40″.00		55ˢ.921		28″.24		48ˢ.739		63″.77		29ˢ.029		39″.74	
ψa, $D_\omega a$	0.00		0.00		+0.01		+0.03		+0.05		+0.19		+0.01		+0.05	
$\psi \delta$, $D_\omega \delta$	−0.3		+0.5		−0.3		+0.5		−0.3		+0.5		−0.3		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*φ* **Argûs.** Mag. 3.7				*π* **Leonis.** Mag. 4.9				*η* **Leonis.** Mag. 3.6				*α* **Leonis.** (*Regulus.*) Mag. 1.3		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	9 53		−54 9		9 55		+ 8 26		10 2		+17 10		10 3		+12 2
	s		″		s		″		s		″		s		″
Jan. 0.6	53.87		34.4		44.90		66.1		43.56		33.9		52.36		54.6
10.6	54.21	34	37.9	35	45.17	27	64.5	16	43.85	29	32.6	13	52.65	29	53.1
20.6	54.47	26	41.5	36	45.41	24	63.0	15	44.10	25	31.6	10	52.89	24	51.9
30.6	54.67	20	45.3	38	45.60	19	61.8	12	44.31	21	30.9	7	53.09	20	50.9
Feb. 9.5	54.80	13	49.1	38	45.74	14	60.9	9	44.46	15	30.5	4	53.24	15	50.2
19.5	54.85	5	52.8	37	45.83	9	60.2	7	44.57	11	30.3	2	53.35	11	49.7
Mar. 1.5	54.83	2	56.3	35	45.88	5	59.8	4	44.62	5	30.4	1	53.40	5	49.5
11.4	54.75	8	59.6	33	45.88	0	59.6	2	44.63	1	30.7	3	53.41	1	49.5
21.4	54.61	14	62.6	30	45.84	4	59.5	1	44.59	4	31.2	5	53.37	4	49.7
31.4	54.42	19	65.2	26	45.77	7	59.7	2	44.52	7	31.8	6	53.31	6	50.1
Apr. 10.4	54.20	22	67.5	23	45.67	10	59.9	2	44.42	10	32.4	6	53.21	10	50.5
20.3	53.94	26	69.2	17	45.56	11	60.3	4	44.31	11	33.1	7	53.10	11	51.0
30.3	53.67	27	70.5	13	45.44	12	60.7	4	44.19	12	33.7	6	52.98	12	51.5
May 10.3	53.39	28	71.4	9	45.32	12	61.2	5	44.06	13	34.3	6	52.86	12	52.1
20.3	53.11	28	71.7	3	45.20	12	61.6	4	43.94	12	34.8	5	52.74	12	52.6
30.2	52.83	28	71.5	2	45.09	11	62.1	5	43.82	12	35.3	5	52.63	11	53.1
June 9.2	52.57	26	70.9	6	45.00	9	62.6	5	43.72	10	35.7	4	52.53	10	53.5
19.2	52.33	24	69.8	11	44.92	8	63.1	5	43.64	8	35.9	2	52.45	8	53.9
29.1	52.12	21	68.2	16	44.86	6	63.5	4	43.58	6	36.0	1	52.39	6	54.2
July 9.1	51.94	18	66.3	19	44.83	3	63.9	4	43.54	4	36.0	0	52.35	4	54.4
19.1	51.80	14	64.1	22	44.82	1	64.2	3	43.52	2	35.9	1	52.33	2	54.5
29.1	51.71	9	61.6	25	44.83	1	64.4	2	43.53	1	35.7	2	52.34	1	54.5
Aug. 8.0	51.66	5	58.9	27	44.86	3	64.5	1	43.56	3	35.3	4	52.37	3	54.4
18.0	51.67	1	56.1	28	44.93	7	64.4	1	43.62	6	34.7	6	52.42	5	54.1
28.0	51.74	7	53.4	27	45.02	9	64.2	2	43.71	9	34.0	7	52.51	9	53.7
Sept. 7.0	51.86	12	50.7	27	45.14	12	63.9	3	43.83	12	33.1	9	52.62	11	53.1
16.9	52.05	19	48.3	24	45.29	15	63.3	6	43.98	15	32.0	11	52.77	15	52.3
26.9	52.30	25	46.3	20	45.48	19	62.5	8	44.16	18	30.8	12	52.95	18	51.2
Oct. 6.9	52.60	30	44.6	17	45.69	21	61.5	10	44.37	21	29.3	15	53.16	21	50.0
16.8	52.96	36	43.5	11	45.93	24	60.3	12	44.62	25	27.7	16	53.40	24	48.6
26.8	53.36	40	42.9	6	46.21	28	58.8	15	44.89	27	25.9	18	53.67	27	46.9
Nov. 5.8	53.80	44	42.9	0	46.51	30	57.1	17	45.20	31	24.1	18	53.96	29	45.2
15.8	54.27	47	43.5	6	46.83	32	55.3	18	45.52	32	22.1	20	54.28	32	43.3
25.7	54.74	47	44.8	13	47.16	33	53.4	19	45.86	34	20.2	19	54.62	34	41.4
Dec. 5.7	55.21	47	46.7	19	47.49	33	51.4	20	46.21	35	18.3	19	54.96	34	39.4
15.7	55.66	45	49.1	24	47.82	33	49.4	20	46.56	35	16.5	18	55.30	34	37.5
25.7	56.08	42	52.0	29	48.14	32	47.5	19	46.89	33	14.8	17	55.62	32	35.7
35.6	56.44	36	55.3	33	48.44	30	45.8	17	47.20	31	13.4	14	55.92	30	34.0
Sec δ, Tan δ	1.708		−1.385		1.011		+0.149		1.047		+0.309		1.024		+0.220
Mean Place	$52^{\mathrm{s}}.556$		$46''.90$		$43^{\mathrm{s}}.375$		$69''.09$		$41^{\mathrm{s}}.951$		$39''.51$		$50^{\mathrm{s}}.825$		$59''.05$
$D'_\psi \alpha$, $D_\omega \alpha$	−0.02		−0.08		0.00		+0.01		0.00		+0.02		0.00		+0.01
$D_\psi \delta$, $D_\omega \delta$	−0.3		+0.5		−0.3		+0.5		−0.3		+0.5		−0.3		+0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**λ Hydræ.** Mag. 3.8				**q Velorum.** Mag. 4.1				**32 Ursæ Majoris.** Mag. 5.7				**ζ Leonis.** Mag. 3.6			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	10 6		−11 55		10 11		−41 41		10 11		+65 31		10 11		+23 50	
	s		″		s		″		s		″		s		″	
an. 0.6	27.94		58.2		11.01		51.7		56.34		43.1		59.63		21.0	
10.6	28.22	28	60.7	25	11.32	31	54.9	32	56.91	57	44.0	9	59.93	30	20.0	10
20.6	28.45	23	63.1	24	11.58	26	58.3	34	57.40	49	45.3	13	60.20	27	19.3	7
30.6	28.64	19	65.4	23	11.79	21	61.8	35	57.80	40	47.1	18	60.43	23	19.0	3
eb. 9.5	28.79	15	67.6	22	11.94	15	65.2	34	58.10	30	49.3	22	60.60	17	19.0	0
19.5	28.88	9	69.5	19	12.03	9	68.5	33	58.29	19	51.7	24	60.71	11	19.2	2
ar. 1.5	28.92	4	71.2	17	12.06	3	71.7	32	58.37	8	54.3	26	60.78	7	19.7	5
11.5	28.93	1	72.6	14	12.03	3	74.6	29	58.34	3	56.9	26	60.79	1	20.4	7
21.4	28.89	4	73.8	12	11.97	6	77.3	27	58.21	13	59.4	25	60.76	3	21.2	8
31.4	28.82	7	74.7	9	11.86	11	79.6	23	57.99	22	61.7	23	60.70	6	22.1	9
pr. 10.4	28.73	9	75.3	6	11.71	15	81.5	19	57.70	29	63.8	21	60.60	10	23.1	10
20.3	28.62	11	75.7	4	11.55	16	83.1	16	57.36	34	65.5	17	60.49	11	24.0	9
30.3	28.50	12	75.8	1	11.37	18	84.2	11	56.98	38	66.8	13	60.36	13	24.8	8
ay 10.3	28.37	13	75.8	0	11.18	19	84.9	7	56.58	40	67.7	9	60.22	14	25.5	7
20.3	28.25	12	75.5	3	10.99	19	85.1	2	56.18	40	68.1	4	60.09	13	26.1	6
30.2	28.14	11	75.0	5	10.80	19	85.0	1	55.79	39	67.9	2	59.97	12	26.5	4
une 9.2	28.04	10	74.3	7	10.62	18	84.4	6	55.43	36	67.3	6	59.86	11	26.8	3
19.2	27.95	9	73.5	8	10.46	16	83.4	10	55.11	32	66.2	11	59.77	9	26.9	1
29.2	27.88	7	72.5	10	10.31	15	82.1	13	54.83	28	64.7	15	59.70	7	26.8	1
uly 9.1	27.82	6	71.5	10	10.19	12	80.4	17	54.61	22	62.8	19	59.65	5	26.6	2
19.1	27.79	3	70.3	12	10.09	10	78.4	20	54.44	17	60.5	23	59.62	3	26.2	4
29.1	27.78	1	69.1	12	10.03	6	76.3	21	54.35	9	57.9	26	59.61	1	25.6	6
ug. 8.0	27.80	2	68.0	11	10.00	3	74.0	23	54.32	3	55.1	28	59.64	3	24.8	8
18.0	27.84	4	66.9	11	10.01	1	71.6	24	54.36	4	52.0	31	59.69	5	23.8	10
28.0	27.92	8	65.9	10	10.06	5	69.2	24	54.47	11	48.8	32	59.77	8	22.7	11
ept. 7.0	28.02	10	65.1	8	10.16	10	67.0	22	54.65	18	45.6	32	59.88	11	21.4	13
16.9	28.16	14	64.5	6	10.30	14	65.0	20	54.91	26	42.3	33	60.03	15	19.9	15
26.9	28.33	17	64.2	3	10.49	19	63.3	17	55.24	33	39.1	32	60.21	18	18.3	16
Oct. 6.9	28.53	20	64.3	1	10.73	24	62.0	13	55.64	40	35.9	32	60.42	21	16.5	18
16.9	28.76	23	64.7	4	11.01	28	61.1	9	56.10	46	33.0	29	60.66	24	14.6	19
26.8	29.03	27	65.5	8	11.34	33	60.7	4	56.63	53	30.3	27	60.94	28	12.6	20
Nov. 5.8	29.33	30	66.6	11	11.69	35	60.9	2	57.21	58	27.9	24	61.26	32	10.6	20
15.8	29.65	32	68.1	15	12.07	38	61.7	8	57.84	63	25.8	21	61.59	33	8.5	21
25.7	29.98	33	69.9	18	12.47	40	63.0	13	58.50	66	24.2	16	61.94	35	6.5	20
Dec. 5.7	30.31	33	72.0	21	12.87	40	64.9	19	59.17	67	23.1	11	62.30	36	4.7	18
15.7	30.64	33	74.3	23	13.26	39	67.3	24	59.84	67	22.6	5	62.66	36	3.0	17
25.7	30.96	32	76.8	25	13.63	37	70.0	27	60.49	65	22.5	1	63.00	34	1.5	15
35.6	31.25	29	79.3	25	13.97	34	73.1	31	61.08	59	23.0	5	63.33	33	0.3	12
ec δ, Tan δ	1.022		−0.211		1.339		−0.891		2.414		+2.197		1.093		+0.442	
ean Place	26ˢ.654		60″.44		9ˢ.860		61″.69		52ˢ.653		58″.59		57ˢ.954		28″.88	
$D_\psi\alpha$, $D_\omega\alpha$	0.00		−0.01		−0.01		−0.05		+0.03		+0.13		+0.01		+0.03	
$D_\psi\delta$, $D_\omega\delta$	−0.3		+0.5		−0.4		+0.5		−0.4		+0.5		−0.4		+0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Ursæ Majoris. Mag. 3.5				γ Leonis *pr.* Mag. 2.6				μ Ursæ Majoris. Mag. 3.2				30 H. Ursæ Majoris. Mag. 4.9		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.
	h m 10 11		° ′ +43 19		h m 10 15		° ′ +20 15		h m 10 17		° ′ +41 55		h m 10 18		° ′ +65 5
	s		″		s		″		s		″		s		″
Jan. 0.7	60.81		69.5		18.91		71.9		18.36		26.5		5.12		32.4
10.6	61.17	36	69.4	1	19.21	30	70.7	12	18.73	37	26.3	2	5.70	58	33.2
20.6	61.49	32	69.8	4	19.48	27	69.8	9	19.05	32	26.5	2	6.21	51	34.5
30.6	61.75	26	70.5	7	19.70	22	69.2	6	19.31	26	27.1	6	6.63	42	36.3
Feb. 9.5	61.95	20	71.6	11	19.87	17	69.0	2	19.52	21	28.1	10	6.95	32	38.4
19.5	62.09	14	73.0	14	19.99	12	69.0	0	19.66	14	29.4	13	7.15	20	40.8
Mar. 1.5	62.16	7	74.6	16	20.06	7	69.3	3	19.73	7	30.9	15	7.24	9	43.4
11.5	62.17	1	76.3	17	20.08	2	69.7	4	19.75	2	32.6	17	7.22	2	46.1
21.4	62.12	5	78.0	17	20.05	3	70.3	6	19.71	4	34.3	17	7.10	12	48.6
31.4	62.02	10	79.8	18	19.99	6	71.1	8	19.62	9	36.0	17	6.89	21	51.0
Apr. 10.4	61.89	13	81.4	16	19.90	9	71.9	8	19.49	13	37.6	16	6.61	28	53.2
20.4	61.72	17	82.8	14	19.80	10	72.7	8	19.34	15	39.0	14	6.26	35	55.0
30.3	61.54	18	83.9	11	19.68	12	73.5	8	19.17	17	40.2	12	5.88	38	56.3
May 10.3	61.35	19	84.8	9	19.55	13	74.2	7	18.98	19	41.2	10	5.48	40	57.2
20.3	61.16	19	85.4	6	19.42	13	74.8	6	18.80	18	41.8	6	5.07	41	57.7
30.2	60.98	18	85.6	2	19.31	11	75.2	4	18.63	17	42.1	3	4.67	40	57.6
June 9.2	60.82	16	85.5	1	19.20	11	75.6	4	18.47	16	42.1	0	4.30	37	57.0
19.2	60.68	14	85.1	4	19.11	9	75.8	2	18.33	14	41.7	4	3.96	34	56.0
29.2	60.57	11	84.3	8	19.04	7	75.8	0	18.22	11	41.0	7	3.66	30	54.5
July 9.1	60.48	9	83.3	10	18.99	5	75.7	1	18.13	9	40.0	10	3.42	24	52.6
19.1	60.43	5	81.9	14	18.96	3	75.5	2	18.08	5	38.8	12	3.24	18	50.4
29.1	60.41	2	80.3	16	18.96	0	75.1	4	18.05	3	37.3	15	3.13	11	47.8
Aug. 8.0	60.42	1	78.5	18	18.98	2	74.5	6	18.06	1	35.5	18	3.08	5	45.0
18.0	60.47	5	76.5	20	19.02	4	73.7	8	18.11	5	33.6	19	3.11	3	41.9
28.0	60.56	9	74.3	22	19.10	8	72.8	9	18.19	8	31.4	22	3.20	9	38.7
Sept. 7.0	60.69	13	71.9	24	19.21	11	71.7	11	18.31	12	29.1	23	3.37	17	35.4
16.9	60.87	18	69.4	25	19.35	14	70.4	13	18.47	16	26.7	24	3.62	25	32.1
26.9	61.08	21	66.9	25	19.52	17	68.9	15	18.67	20	24.2	25	3.94	32	28.9
Oct. 6.9	61.33	25	64.3	26	19.73	21	67.3	16	18.91	24	21.7	25	4.33	39	25.7
16.9	61.62	29	61.8	25	19.97	24	65.5	18	19.20	29	19.2	25	4.79	46	22.6
26.8	61.95	33	59.3	25	20.24	27	63.6	19	19.52	32	16.7	25	5.31	52	19.8
Nov. 5.8	62.32	37	57.0	23	20.54	30	61.6	20	19.87	35	14.3	24	5.89	58	17.4
15.8	62.72	40	54.9	21	20.87	33	59.6	20	20.26	39	12.1	22	6.52	63	15.3
25.7	63.14	42	53.0	19	21.21	34	57.5	21	20.67	41	10.2	19	7.18	66	13.6
Dec. 5.7	63.56	42	51.4	16	21.57	36	55.6	19	21.09	42	8.6	16	7.86	68	12.4
15.7	63.99	43	50.2	12	21.92	35	53.8	18	21.51	42	7.3	13	8.54	68	11.7
25.7	64.40	41	49.4	8	22.26	34	52.2	16	21.91	40	6.4	9	9.20	66	11.7
35.6	64.79	39	49.1	3	22.58	32	50.8	14	22.30	39	5.9	5	9.82	62	12.1
Sec δ, Tan δ	1.375		+0.943		1.066		+0.369		1.344		+0.898		2.458		+2.245
Mean Place	58ˢ.636		81″.76		17ˢ.315		78″.99		16ˢ.275		38″.82		1ˢ.440		48″.46
$D'_\psi \alpha$, $D_\omega \alpha$	+0.01		+0.06		0.00		+0.02		+0.01		+0.05		+0.03		+0.14
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.5		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**μ Hydræ.** Mag. 4.1				**31 Leonis Minoris.** Mag. 4.4				**α Antliæ.** Mag. 4.4				**36 Ursæ Majoris.** Mag. 4.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	10 21		−16 24		10 22		+37 8		10 23		−30 37		10 25		+56 24	
	s		″		s		″		s		″		s		″	
an. 0.7	59.92	28	3.8	26	60.33	35	23.5	5	16.73	30	58.7	30	14.56	46	45.1	4
10.6	60.20	25	6.4	27	60.68	30	23.0	1	17.03	26	61.7	31	15.02	41	45.5	8
20.6	60.45	21	9.1	25	60.98	26	22.9	3	17.29	21	64.8	31	15.43	34	46.3	13
30.6	60.66	16	11.6	24	61.24	20	23.2	7	17.50	16	67.9	31	15.77	26	47.6	17
eb. 9.5	60.82	11	14.0	22	61.44	14	23.9	11	17.66	11	71.0	29	16.03	18	49.3	20
19.5	60.93	6	16.2	20	61.58	8	25.0	12	17.77	6	73.9	27	16.21	10	51.3	22
ar. 1.5	60.99	1	18.2	17	61.66	3	26.2	14	17.83	1	76.6	24	16.31	1	53.5	23
11.5	61.00	2	19.9	14	61.69	3	27.6	16	17.84	4	79.0	22	16.32	6	55.8	23
21.4	60.98	6	21.3	12	61.66	7	29.2	15	17.80	7	81.2	19	16.26	13	58.1	22
31.4	60.92	8	22.5	9	61.59	11	30.7	15	17.73	10	83.1	15	16.13	18	60.3	20
pr. 10.4	60.84	10	23.4	6	61.48	14	32.2	13	17.63	12	84.6	12	15.95	23	62.3	18
20.4	60.74	12	24.0	3	61.34	15	33.5	12	17.51	14	85.8	9	15.72	26	64.1	14
30.3	60.62	12	24.3	1	61.19	16	34.7	9	17.37	14	86.7	5	15.46	27	65.5	11
ay 10.3	60.50	12	24.4	2	61.03	17	35.6	7	17.23	15	87.2	1	15.19	27	66.6	6
20.3	60.38	12	24.2	4	60.86	15	36.3	4	17.08	15	87.3	2	14.92	27	67.2	1
30.2	60.26	11	23.8	6	60.71	14	36.7	1	16.93	14	87.1	6	14.65	25	67.3	2
une 9.2	60.15	10	23.2	8	60.57	13	36.8	2	16.79	12	86.5	8	14.40	23	67.1	7
19.2	60.05	8	22.4	10	60.44	10	36.6	5	16.67	11	85.7	12	14.17	19	66.4	11
29.2	59.97	7	21.4	11	60.34	9	36.1	7	16.56	10	84.5	15	13.98	16	65.3	15
uly 9.1	59.90	5	20.3	13	60.25	5	35.4	10	16.46	7	83.0	16	13.82	12	63.8	18
19.1	59.85	2	19.0	13	60.20	2	34.4	13	16.39	5	81.4	18	13.70	7	62.0	22
29.1	59.83	0	17.7	13	60.18	1	33.1	15	16.34	2	79.6	19	13.63	3	59.8	24
ug. 8.1	59.83	2	16.4	13	60.19	3	31.6	17	16.32	2	77.7	19	13.60	3	57.4	27
18.0	59.85	6	15.1	12	60.22	7	29.9	19	16.34	4	75.8	19	13.63	7	54.7	28
28.0	59.91	9	13.9	10	60.29	11	28.0	21	16.38	9	73.9	18	13.70	13	51.9	30
ept. 7.0	60.00	12	12.9	8	60.40	15	25.9	22	16.47	12	72.1	15	13.83	18	48.9	30
16.9	60.12	16	12.1	5	60.55	18	23.7	23	16.59	17	70.6	13	14.01	23	45.9	31
26.9	60.28	19	11.6	2	60.73	23	21.4	24	16.76	20	69.3	9	14.24	29	42.8	30
ct. 6.9	60.47	23	11.4	1	60.96	26	19.0	24	16.96	25	68.4	5	14.53	35	39.8	29
16.9	60.70	26	11.5	6	61.22	30	16.6	24	17.21	28	67.9	0	14.88	39	36.9	28
26.8	60.96	29	12.1	9	61.52	34	14.2	24	17.49	31	67.9	5	15.27	44	34.1	26
Nov. 5.8	61.25	32	13.0	14	61.86	36	11.8	22	17.80	34	68.4	10	15.71	48	31.5	22
15.8	61.57	33	14.4	17	62.22	39	9.6	20	18.14	36	69.4	14	16.19	51	29.3	19
25.8	61.90	35	16.1	21	62.61	39	7.6	18	18.50	37	70.8	19	16.70	53	27.4	15
Dec. 5.7	62.25	34	18.2	23	63.00	40	5.8	15	18.87	36	72.7	23	17.23	53	25.9	10
15.7	62.59	32	20.5	24	63.40	39	4.3	11	19.23	35	75.0	27	17.76	51	24.9	5
25.7	62.91	31	22.9	26	63.79	36	3.2	7	19.58	32	77.7	28	18.27	48	24.4	0
35.6	63.22		25.5		64.15		2.5		19.90		80.5		18.75		24.4	
ec δ, Tan δ	1.042		−0.294		1.254		+0.757		1.162		−0.592		1.808		+1.506	
ean Place	58ˢ.735		7″.03		58ˢ.420		35″.19		15ˢ.630		65″.93		11ˢ.852		60″.55	
$_\psi \alpha$, $D_\omega \alpha$	0.00		−0.02		+0.01		+0.05		−0.01		−0.04		+0.02		+0.09	
$_\psi \delta$, $D_\omega \delta$	−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**9 H. Draconis.** Mag. 5.0				**ρ Leonis.** Mag. 3.8				**33 Sextantis.** Mag. 6.4				**41 Leonis Min** Mag. 5.0		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		De
	h m 10 27		° ′ +76 8		h m 10 28		° ′ + 9 44		h m 10 37		° ′ − 1 17		h m 10 38		+
	s		″		s		″		s		″		s		
Jan. 0.7	60.17		47.4		21.62		35.1		5.96		40.9		49.37		52
10.6	61.10	93	48.4	10	21.92	30	33.4	17	6.25	29	43.0	21	49.69	32	51
20.6	61.92	82	50.0	16	22.18	26	31.9	15	6.51	26	45.0	20	49.98	29	50
30.6	62.60	68	52.1	21	22.40	22	30.7	12	6.73	22	46.8	18	50.22	24	49
Feb. 9.6	63.11	51	54.5	24	22.57	17	29.7	10	6.91	18	48.4	16	50.42	20	49
19.5	63.44	33	57.2	27	22.69	12	29.1	6	7.04	13	49.8	14	50.56	14	49
Mar. 1.5	63.58	14	60.1	29	22.77	8	28.7	4	7.12	8	50.9	11	50.66	10	50
11.5	63.54	4	63.0	29	22.81	4	28.5	2	7.16	4	51.7	8	50.70	4	50
21.4	63.33	21	65.8	28	22.80	1	28.6	1	7.16	0	52.3	6	50.69	1	51
31.4	62.96	37	68.4	26	22.75	5	28.8	2	7.12	4	52.7	4	50.65	4	52
Apr. 10.4	62.46	50	70.7	23	22.68	7	29.2	4	7.06	6	52.8	1	50.58	7	53
20.4	61.85	61	72.7	20	22.59	9	29.7	5	6.97	9	52.8	0	50.48	10	54
30.3	61.16	69	74.1	14	22.48	11	30.2	5	6.87	10	52.7	1	50.37	11	55
May 10.3	60.42	74	75.1	10	22.37	11	30.7	5	6.77	10	52.4	3	50.24	13	56
20.3	59.66	76	75.5	4	22.26	11	31.3	6	6.66	11	52.0	4	50.12	12	57
30.3	58.90	76	75.4	1	22.15	11	31.8	5	6.56	10	51.5	5	50.00	12	57
June 9.2	58.18	72	74.7	7	22.05	10	32.3	5	6.46	10	50.9	6	49.88	12	58
19.2	57.51	67	73.5	12	21.96	9	32.8	5	6.37	9	50.3	6	49.78	10	58
29.2	56.91	60	71.8	17	21.89	7	33.2	4	6.29	8	49.7	6	49.69	9	58
July 9.1	56.40	51	69.7	21	21.83	6	33.5	3	6.23	6	49.0	7	49.62	7	58
19.1	55.99	41	67.2	25	21.80	3	33.7	2	6.18	5	48.3	7	49.57	5	58
29.1	55.69	30	64.3	29	21.78	2	33.9	2	6.16	2	47.7	6	49.54	3	57
Aug. 8.1	55.51	18	61.2	31	21.79	1	33.9	0	6.15	1	47.1	6	49.54	0	56
18.0	55.45	6	57.8	34	21.82	3	33.7	2	6.17	2	46.6	5	49.56	2	55
28.0	55.52	7	54.3	35	21.88	6	33.4	3	6.22	5	46.3	3	49.61	5	54
Sept. 7.0	55.72	20	50.7	36	21.97	9	32.9	5	6.30	8	46.2	1	49.69	8	53
17.0	56.04	32	47.1	36	22.09	12	32.2	7	6.41	11	46.2	0	49.81	12	51
26.9	56.50	46	43.5	36	22.24	15	31.3	9	6.55	14	46.5	3	49.96	15	50
Oct. 6.9	57.08	58	40.1	34	22.43	19	30.1	12	6.72	17	47.1	6	50.14	18	48
16.9	57.77	69	36.9	32	22.65	22	28.7	14	6.93	21	48.0	9	50.37	23	46
26.8	58.58	81	34.0	29	22.90	25	27.2	15	7.18	25	49.1	11	50.63	26	44
Nov. 5.8	59.48	90	31.5	25	23.19	29	25.4	18	7.46	28	50.6	15	50.92	29	42
15.8	60.46	98	29.3	22	23.50	31	23.5	19	7.76	30	52.3	17	51.24	32	39
25.8	61.50	104	27.7	16	23.82	32	21.4	21	8.08	32	54.2	19	51.58	34	37
Dec. 5.7	62.57	107	26.6	11	24.16	34	19.4	20	8.42	34	56.3	21	51.94	36	35
15.7	63.65	108	26.1	5	24.50	34	17.4	20	8.75	33	58.5	22	52.30	36	33
25.7	64.69	104	26.2	1	24.83	33	15.4	20	9.08	33	60.7	22	52.65	35	32.
35.7	65.68	99	26.9	7	25.15	32	13.6	18	9.39	31	62.9	22	52.99	34	30.
Sec δ, Tan δ	4.177		+4.055		1.015		+0.172		1.000		−0.023		1.092		+0.
Mean Place	$54^{s}.385$		64″.96		$20^{s}.236$		39″.87		$4^{s}.733$		39″.07		$47^{s}.842$		61″.
D′ψ α, Dω α	+0.04		+0.25		0.00		+0.01		0.00		0.00		0.00		+0.
δ, Dω δ	−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*θ* Argûs. Mag. 3.0				42 Leonis Minoris. Mag. 5.4				*η* Argûs. Var. 1.6–6.6				*μ* Argûs. Mag. 2.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	10 39		−63 56		10 41		+31 7		10 41		−59 14		10 43		−48 58	
	s		″		s		″		s		″		s		″	
Jan. 0.7	56.18		43.5		10.18		37.8		46.52		1.1		7.53		4.3	
10.6	56.66	48	46.6	31	10.52	34	36.9	9	46.95	43	4.2	31	7.90	37	7.4	31
20.6	57.08	42	50.0	34	10.83	31	36.4	5	47.33	38	7.6	34	8.23	33	10.7	33
30.6	57.41	33	53.7	37	11.09	26	36.3	1	47.63	30	11.3	37	8.49	26	14.2	35
Feb. 9.6	57.65	24	57.5	38	11.30	21	36.6	3	47.86	23	15.0	37	8.69	20	17.8	36
19.5	57.80	15	61.4	39	11.45	15	37.2	6	48.01	15	18.8	38	8.83	14	21.4	36
Mar. 1.5	57.86	6	65.3	39	11.55	10	38.1	9	48.08	7	22.6	38	8.91	8	24.9	35
11.5	57.84	2	69.0	37	11.59	4	39.2	11	48.08	0	26.2	36	8.93	2	28.2	33
21.4	57.74	10	72.5	35	11.59	0	40.5	13	48.00	8	29.6	34	8.89	4	31.3	31
31.4	57.58	16	75.8	33	11.54	5	41.8	13	47.87	13	32.7	31	8.81	8	34.0	27
Apr. 10.4	57.35	23	78.7	29	11.46	8	43.1	13	47.69	18	35.5	28	8.68	13	36.5	25
20.4	57.07	28	81.2	25	11.36	10	44.4	13	47.46	23	37.9	24	8.52	16	38.5	20
30.3	56.75	32	83.3	21	11.23	13	45.6	12	47.20	26	39.9	20	8.34	18	40.1	16
May 10.3	56.40	35	84.9	16	11.09	14	46.6	10	46.91	29	41.4	15	8.13	21	41.4	13
20.3	56.03	37	86.0	11	10.95	14	47.4	8	46.61	30	42.4	10	7.92	21	42.1	7
30.3	55.64	39	86.6	6	10.81	14	47.9	5	46.30	31	42.9	5	7.70	22	42.4	3
June 9.2	55.26	38	86.6	0	10.68	13	48.3	4	45.99	31	42.9	0	7.49	21	42.2	2
19.2	54.89	37	86.2	4	10.57	11	48.4	1	45.69	30	42.4	5	7.28	21	41.6	6
29.2	54.54	35	85.3	9	10.47	10	48.2	2	45.40	29	41.4	10	7.09	19	40.6	10
July 9.1	54.22	32	83.8	15	10.39	8	47.8	4	45.14	26	40.0	14	6.91	18	39.2	14
19.1	53.93	29	82.0	18	10.33	6	47.1	7	44.91	23	38.2	18	6.76	15	37.4	18
29.1	53.70	23	79.8	22	10.29	4	46.2	9	44.73	18	36.0	22	6.64	12	35.3	21
Aug. 8.1	53.53	17	77.3	25	10.28	1	45.0	12	44.59	14	33.5	25	6.55	9	33.0	23
18.0	53.42	11	74.6	27	10.30	2	43.6	14	44.51	8	30.8	27	6.51	4	30.6	24
28.0	53.38	4	71.7	29	10.35	5	42.1	15	44.49	2	28.1	27	6.51	0	28.1	25
Sept. 7.0	53.43	5	68.8	29	10.43	8	40.3	18	44.54	5	25.3	28	6.57	6	25.6	25
17.0	53.56	13	66.1	27	10.54	11	38.4	19	44.66	12	22.6	27	6.68	11	23.2	24
26.9	53.78	22	63.5	26	10.70	16	36.3	21	44.85	19	20.2	24	6.84	16	21.1	21
Oct. 6.9	54.09	31	61.2	23	10.89	19	34.1	22	45.12	27	18.1	21	7.07	23	19.4	17
16.9	54.48	39	59.4	18	11.12	23	31.8	23	45.47	35	16.4	17	7.35	28	18.0	14
26.8	54.94	46	58.1	13	11.39	27	29.4	24	45.87	40	15.2	12	7.68	33	17.2	8
Nov. 5.8	55.46	52	57.3	8	11.69	30	27.0	24	46.33	46	14.5	7	8.05	37	16.8	4
15.8	56.03	57	57.2	1	12.03	34	24.7	23	46.83	50	14.5	0	8.46	41	17.1	3
25.8	56.63	60	57.7	5	12.39	36	22.5	22	47.36	53	15.1	6	8.90	44	17.9	8
Dec. 5.7	57.24	61	58.8	11	12.76	37	20.5	20	47.90	54	16.3	12	9.35	45	19.4	15
15.7	57.84	60	60.6	18	13.14	38	18.8	17	48.44	54	18.1	18	9.79	44	21.4	20
25.7	58.42	58	62.9	23	13.51	37	17.3	15	48.95	51	20.5	24	10.22	43	23.8	24
35.7	58.94	52	65.8	29	13.87	36	16.2	11	49.42	47	23.4	29	10.62	40	26.7	29
Sec *δ*, Tan *δ*	2.277		−2.046		1.168		+0.604		1.955		−1.680		1.524		−1.149	
Mean Place	$55^{s}.223$		$57''.98$		$8^{s}.529$		$49''.16$		$45^{s}.592$		$14''.78$		$6^{s}.611$		$15''.91$	
$D'_{\phi}\alpha$, $D_{\infty}\alpha$	−0.02		−0.13		+0.01		+0.04		−0.01		−0.11		−0.01		−0.07	
$D_{\phi}\delta$, $D_{\infty}\delta$	−0.4		+0.3		−0.4		+0.3		−0.4		+0.3		−0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*l* Leonis. Mag. 5.3				δ² Chamæleon. Mag. 4.6				ν Hydræ. Mag. 3.3				46 Leonis Mi Mag. 3.9		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Decl tio
	h m 10 44		° ′ +10 59		h m 10 44		° ′ −80 5		h m 10 45		° ′ −15 44		h m 10 48		+3
	s		″		s		″		s		″		s		″
Jan. 0.7	48.78		36.8		60.99		14.2		26.84		51.6		35.43		71.
10.6	49.09	31	35.1	17	62.06	107	17.0	28	27.14	30	54.2	26	35.78	35	70.
20.6	49.37	28	33.6	15	62.95	89	20.3	33	27.41	27	56.8	26	36.10	32	70.
30.6	49.60	23	32.4	12	63.65	70	23.9	36	27.64	23	59.3	25	36.38	28	70.
Feb. 9.6	49.79	19	31.5	9	64.15	50	27.7	38	27.82	18	61.6	23	36.60	22	71.
19.5	49.93	14	30.9	6	64.43	28	31.7	40	27.95	13	63.8	22	36.77	17	71.
Mar. 1.5	50.03	10	30.6	3	64.51	8	35.7	40	28.04	9	65.7	19	36.88	11	72.
11.5	50.08	5	30.5	1	64.37	14	39.6	39	28.08	4	67.4	17	36.93	5	74.
21.5	50.08	0	30.6	1	64.04	33	43.4	38	28.08	0	68.9	15	36.94	1	75.
31.4	50.05	3	30.9	3	63.54	50	47.0	36	28.05	3	70.0	11	36.90	4	77.
Apr. 10.4	49.99	6	31.4	5	62.87	67	50.3	33	27.99	6	70.9	9	36.82	8	78.
20.4	49.91	8	31.9	5	62.07	80	53.3	30	27.91	8	71.6	7	36.71	11	80.
30.3	49.82	9	32.5	6	61.15	92	55.8	25	27.81	10	72.0	4	36.57	14	81.
May 10.3	49.71	11	33.1	6	60.13	102	57.9	21	27.70	11	72.1	1	36.43	14	82.
20.3	49.60	11	33.7	6	59.04	109	59.4	15	27.59	11	72.0	1	36.28	15	83.
30.3	49.49	11	34.3	6	57.91	113	60.4	10	27.47	12	71.7	3	36.14	14	83.
June 9.2	49.39	10	34.8	5	56.77	114	60.9	5	27.37	10	71.2	5	36.00	14	84.
19.2	49.30	9	35.3	5	55.64	113	60.8	1	27.27	10	70.5	7	35.87	13	84.
29.2	49.22	8	35.7	4	54.55	109	60.2	6	27.18	9	69.6	9	35.75	12	84.
July 9.2	49.15	7	36.0	3	53.53	102	59.1	11	27.10	8	68.6	10	35.66	9	83.
19.1	49.11	4	36.2	2	52.61	92	57.4	17	27.04	6	67.4	12	35.59	7	82.
29.1	49.08	3	36.2	0	51.83	78	55.4	20	27.00	4	66.2	12	35.54	5	81.
Aug. 8.1	49.07	1	36.1	1	51.21	62	52.9	25	26.98	2	65.0	12	35.52	2	80.
18.0	49.09	2	35.9	2	50.77	44	50.2	27	26.98	0	63.8	12	35.53	1	78.
28.0	49.13	4	35.5	4	50.53	24	47.2	30	27.02	4	62.7	11	35.57	4	77.
Sept. 7.0	49.20	7	34.9	6	50.51	2	44.2	30	27.08	6	61.7	10	35.64	7	75.
17.0	49.31	11	34.1	8	50.71	20	41.2	30	27.18	10	60.9	8	35.75	11	72.
26.9	49.44	13	33.1	10	51.15	44	38.3	29	27.32	14	60.4	5	35.90	15	70.
Oct. 6.9	49.62	18	31.9	12	51.81	66	35.7	26	27.49	17	60.1	3	36.09	19	68.
16.9	49.82	20	30.4	15	52.67	86	33.5	22	27.70	21	60.3	2	36.32	23	65.
26.9	50.07	25	28.8	16	53.71	104	31.7	18	27.94	24	60.8	5	36.59	27	63.
Nov. 5.8	50.34	27	26.9	19	54.90	119	30.5	12	28.22	28	61.7	9	36.90	31	60.
15.8	50.64	30	24.9	20	56.21	131	29.9	6	28.53	31	62.9	12	37.24	34	58.
25.8	50.97	33	22.9	20	57.58	137	29.9	0	28.86	33	64.6	17	37.60	36	56.
Dec. 5.7	51.31	34	20.8	21	58.97	139	30.6	7	29.20	34	66.5	19	37.99	39	54.
15.7	51.65	34	18.7	21	60.32	135	32.0	14	29.55	35	68.7	22	38.38	39	52.
25.7	51.99	34	16.7	20	61.60	128	33.9	19	29.89	34	71.1	24	38.76	38	50.
35.7	52.31	32	14.8	19	62.77	117	36.5	26	30.20	31	73.7	26	39.13	37	49.
Sec δ, Tan δ	1.019		+0.194		5.813		−5.726		1.039		−0.282		1.216		+0.
Mean Place	47^s.473		42″.68		59^s.830		30″.67		25^s.774		54″.10		33^s.747		84″.
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		+0.01		−0.05		−0.36		0.00		−0.02		+0.01		+0.0
$D'_\psi \delta$, $D_\omega \delta$	−0.4		+0.3		−0.4		+0.3		−0.4		+0.3		−0.4		+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**54 Leonis.** Mag. 4.5				**ι Antliæ.** Mag. 4.7				**Groombridge 1706.** Mag. 6.3				**α Crateris.** Mag. 4.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	10 51		+25 11		10 52		−36 40		10 53		+78 12		10 55		−17 50	
	s		″		s		″		s		″		s		″	
Jan. 0.7	2.29	33	61.9	12	46.41	34	41.7	30	17.51	112	73.4	8	38.89	31	43.1	26
10.6	2.62	30	60.7	8	46.75	30	44.7	31	18.63	101	74.2	13	39.20	27	45.7	26
20.6	2.92	26	59.9	5	47.05	25	47.8	32	19.64	86	75.5	19	39.47	24	48.3	25
30.6	3.18	21	59.4	1	47.30	20	51.0	32	20.50	68	77.4	23	39.71	19	50.8	25
Feb. 9.6	3.39	16	59.3	2	47.50	15	54.2	32	21.18	48	79.7	27	39.90	14	53.3	23
19.5	3.55	10	59.5	5	47.65	9	57.4	30	21.66	27	82.4	29	40.04	10	55.6	20
Mar. 1.5	3.65	6	60.0	8	47.74	4	60.4	28	21.93	6	85.3	29	40.14	6	57.6	19
11.5	3.71	1	60.8	10	47.78	0	63.2	26	21.99	15	88.2	30	40.20	1	59.5	16
21.5	3.72	3	61.8	10	47.78	4	65.8	22	21.84	35	91.2	28	40.21	3	61.1	13
31.4	3.69	7	62.8	12	47.74	8	68.0	20	21.49	52	94.0	25	40.18	5	62.4	10
Apr. 10.4	3.62	9	64.0	11	47.66	11	70.0	16	20.97	65	96.5	22	40.13	8	63.4	8
20.4	3.53	11	65.1	11	47.55	13	71.6	13	20.32	77	98.7	17	40.05	10	64.2	5
30.3	3.42	12	66.2	9	47.42	14	72.9	9	19.55	86	100.4	13	39.95	10	64.7	2
May 10.3	3.30	12	67.1	8	47.28	15	73.8	5	18.69	90	101.7	7	39.85	11	64.9	0
20.3	3.18	12	67.9	7	47.13	15	74.3	1	17.79	91	102.4	1	39.74	12	64.9	2
30.3	3.06	12	68.6	4	46.98	16	74.4	3	16.88	89	102.5	4	39.62	11	64.7	4
June 9.2	2.94	11	69.0	3	46.82	15	74.1	6	15.99	86	102.1	9	39.51	10	64.3	7
19.2	2.83	10	69.3	0	46.67	13	73.5	9	15.13	79	101.2	14	39.41	10	63.6	9
29.2	2.73	8	69.3	1	46.54	13	72.6	13	14.34	70	99.8	20	39.31	8	62.7	10
July 9.2	2.65	6	69.2	4	46.41	10	71.3	16	13.64	60	97.8	23	39.23	7	61.7	12
19.1	2.59	4	68.8	6	46.31	8	69.7	18	13.04	48	95.5	28	39.16	5	60.5	12
29.1	2.55	1	68.2	8	46.23	6	67.9	19	12.56	36	92.7	31	39.11	3	59.3	13
Aug. 8.1	2.54	1	67.4	10	46.17	3	66.0	20	12.20	21	89.6	33	39.08	1	58.0	12
18.0	2.55	3	66.4	13	46.14	1	64.0	21	11.99	7	86.3	36	39.07	2	56.8	12
28.0	2.58	7	65.1	14	46.15	5	61.9	20	11.92	9	82.7	37	39.09	5	55.6	11
Sept. 7.0	2.65	10	63.7	17	46.20	9	59.9	18	12.01	24	79.0	37	39.14	9	54.5	9
17.0	2.75	14	62.0	18	46.29	14	58.1	16	12.25	39	75.3	37	39.23	12	53.6	7
26.9	2.89	17	60.2	19	46.43	19	56.5	13	12.64	54	71.6	36	39.35	17	52.9	3
Oct. 6.9	3.06	22	58.3	21	46.62	23	55.2	9	13.18	68	68.0	34	39.52	20	52.6	1
16.9	3.28	25	56.2	23	46.85	27	54.3	5	13.86	83	64.6	32	39.72	24	52.5	4
26.9	3.53	28	53.9	22	47.12	32	53.8	1	14.69	95	61.4	28	39.96	28	52.9	8
Nov. 5.8	3.81	32	51.7	23	47.44	35	53.9	5	15.64	105	58.6	25	40.24	30	53.7	12
15.8	4.13	34	49.4	23	47.79	37	54.4	11	16.69	115	56.1	19	40.54	33	54.9	15
25.8	4.47	35	47.1	21	48.16	39	55.5	16	17.84	121	54.2	14	40.87	34	56.4	19
Dec. 5.7	4.82	37	45.0	19	48.55	39	57.1	21	19.05	123	52.8	8	41.21	35	58.3	22
15.7	5.19	36	43.1	17	48.94	38	59.2	24	20.28	121	52.0	3	41.56	34	60.5	24
25.7	5.55	34	41.4	14	49.32	36	61.6	28	21.49	116	51.7	5	41.90	33	62.9	25
35.7	5.89		40.0		49.68		64.4		22.65		52.2		42.23		65.4	
Sec δ, Tan δ	1.105		+0.471		1.247		−0.745		4.899		+4.796		1.051		−0.322	
Mean Place	0ˢ.813		72″.25		45ˢ.515		50″.23		11ˢ.477		93″.02		37ˢ.895		45″.95	
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		+0.03		−0.01		−0.05		+0.04		+0.31		0.00		−0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.3		−0.4		+0.3		−0.4		+0.3		−0.4		+0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*d* Leonis. Mag. 5.0				*β* Ursæ Majoris. Mag. 2.4				*α* Ursæ Majoris. Mag. 2.0				*χ* Leonis. Mag. 4.7		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declina- tion N.
	h m 10 56		° ' + 4 4		h m 10 56		° ' +56 49		h m 10 58		° ' +62 11		h m 11 0		° + 7
	s		″		s		″		s		″		s		″
Jan. 0.7	11.45		22.5		45.74		60.1		32.46		77.9		39.20		39.7
10.7	11.76	31	20.5	20	46.23	49	60.1	0	33.02	56	78.0	1	39.51	31	37.8
20.6	12.04	28	18.7	18	46.68	45	60.7	6	33.52	50	78.8	8	39.80	29	36.1
30.6	12.28	24	17.1	16	47.06	38	61.7	10	33.96	44	80.0	12	40.04	24	34.7
Feb. 9.6	12.48	20	15.8	13	47.37	31	63.2	15	34.31	35	81.7	17	40.24	20	33.6
19.5	12.63	15	14.8	10	47.60	23	65.1	19	34.57	26	83.8	21	40.40	16	32.8
Mar. 1.5	12.73	10	14.0	8	47.75	15	67.3	22	34.74	17	86.2	24	40.51	11	32.2
11.5	12.79	6	13.5	5	47.82	7	69.6	23	34.81	7	88.8	26	40.57	6	31.9
21.5	12.81	2	13.2	3	47.81	1	72.1	25	34.79	2	91.4	26	40.59	2	31.9
31.4	12.79	2	13.1	1	47.73	8	74.5	24	34.69	10	93.9	25	40.58	1	32.0
Apr. 10.4	12.74	5	13.2	1	47.58	15	76.7	22	34.51	18	96.3	24	40.53	5	32.3
20.4	12.67	7	13.5	3	47.39	19	78.8	21	34.27	24	98.4	21	40.46	7	32.7
30.4	12.58	9	13.8	3	47.16	23	80.5	17	33.98	29	100.2	18	40.37	9	33.2
May 10.3	12.49	9	14.3	5	46.90	26	81.9	14	33.67	31	101.6	14	40.28	9	33.8
20.3	12.39	10	14.8	5	46.63	27	82.8	9	33.33	34	102.6	10	40.17	11	34.4
30.3	12.28	11	15.3	5	46.36	27	83.3	5	32.99	34	103.0	4	40.07	10	35.0
June 9.2	12.18	10	15.9	6	46.09	27	83.4	1	32.66	33	103.0	0	39.97	10	35.6
19.2	12.09	9	16.5	6	45.84	25	83.0	4	32.34	32	102.6	4	39.88	9	36.1
29.2	12.01	8	17.0	5	45.61	23	82.2	8	32.05	29	101.6	10	39.79	9	36.6
July 9.2	11.94	7	17.5	5	45.41	20	81.0	12	31.80	25	100.2	14	39.72	7	37.0
19.1	11.89	5	18.0	5	45.25	16	79.4	16	31.59	21	98.4	18	39.66	6	37.3
29.1	11.85	4	18.3	3	45.12	13	77.4	20	31.42	17	96.2	22	39.62	4	37.5
Aug. 8.1	11.83	2	18.6	3	45.04	8	75.1	23	31.30	12	93.7	25	39.60	2	37.6
18.1	11.84	1	18.8	2	45.00	4	72.5	26	31.24	6	90.9	28	39.60	0	37.5
28.0	11.87	3	18.8	0	45.02	2	69.7	28	31.24	0	87.8	31	39.63	3	37.3
Sept. 7.0	11.93	6	18.6	2	45.08	6	66.7	30	31.30	6	84.6	32	39.68	5	36.9
17.0	12.02	9	18.2	4	45.20	12	63.5	32	31.43	13	81.3	33	39.77	9	36.3
26.9	12.14	12	17.6	6	45.38	18	60.3	32	31.62	19	77.9	34	39.89	12	35.4
Oct. 6.9	12.30	16	16.7	9	45.61	23	57.1	32	31.88	26	74.5	34	40.04	15	34.4
16.9	12.49	19	15.6	11	45.91	30	53.9	32	32.21	33	71.2	33	40.23	19	33.1
26.9	12.73	24	14.2	14	46.26	35	50.8	31	32.61	40	68.1	31	40.46	23	31.5
Nov. 5.8	12.99	26	12.5	17	46.67	41	47.9	29	33.06	45	65.1	30	40.72	26	29.7
15.8	13.28	29	10.7	18	47.12	45	45.3	26	33.57	51	62.5	26	41.01	29	27.8
25.8	13.60	32	8.7	20	47.61	49	43.0	23	34.13	56	60.3	22	41.33	32	25.7
Dec. 5.8	13.94	34	6.6	21	48.13	52	41.2	18	34.71	58	58.5	18	41.67	34	23.6
15.7	14.28	34	4.4	22	48.66	53	39.8	14	35.31	60	57.2	13	42.01	34	21.4
25.7	14.61	33	2.3	21	49.18	52	38.9	9	35.91	60	56.4	8	42.35	34	19.3
35.7	14.93	32	0.2	21	49.69	51	38.6	3	36.49	58	56.3	1	42.67	32	17.4
Sec δ, Tan δ	1.003		+0.071		1.828		+1.530		2.145		+1.897		1.009		+0.137
Mean Place	10ˢ.282		26″.68		43ˢ.315		77″.88		29ˢ.677		96″.50		38ˢ.013		45″.22
D′ψ α, Dω α	0.00		0.00		+0.01		+0.10		+0.01		+0.12		0.00		+0.01
Dψ δ, Dω δ	−0.4		+0.3		−0.4		+0.3		−0.4		+0.3		−0.4		+0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**p^4 Leonis.** Mag. 5.7				**ψ Ursæ Majoris.** Mag. 3.2				**β Crateris.** Mag. 4.5				**δ Leonis.** Mag. 2.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	11 2		+ 2 24		11 4		+44 56		11 7		−22 21		11 9		+20 58	
	s		″		s		″		s		″		s		″	
an. 0.7	35.25		58.4		55.31		79.8		29.43		38.1		36.73		72.4	
10.7	35.56	31	56.3	21	55.71	40	79.2	6	29.75	32	40.8	27	37.07	34	70.9	15
20.6	35.84	28	54.4	19	56.08	37	79.2	0	30.04	29	43.5	27	37.37	30	69.8	11
30.6	36.08	24	52.8	16	56.40	32	79.6	4	30.29	25	46.2	27	37.63	26	69.0	8
eb. 9.6	36.28	20	51.4	14	56.67	27	80.5	9	30.49	20	48.9	27	37.86	23	68.6	4
19.5	36.43	15	50.2	12	56.87	20	81.8	13	30.65	16	51.4	25	38.03	17	68.5	1
ar. 1.5	36.54	11	49.3	9	57.01	14	83.4	16	30.76	11	53.7	23	38.15	12	68.7	2
11.5	36.61	7	48.7	6	57.09	8	85.2	18	30.83	7	55.8	21	38.23	8	69.2	5
21.5	36.63	2	48.3	4	57.11	2	87.2	20	30.85	2	57.7	19	38.26	3	70.0	8
31.4	36.62	1	48.1	2	57.07	4	89.2	20	30.84	1	59.2	15	38.25	1	70.8	8
pr. 10.4	36.57	5	48.1	0	56.98	9	91.1	19	30.80	4	60.5	13	38.21	4	71.8	10
20.4	36.51	6	48.3	2	56.85	13	93.0	19	30.73	7	61.6	11	38.14	7	72.9	11
30.4	36.43	8	48.6	3	56.70	15	94.6	16	30.64	9	62.3	7	38.05	9	73.9	10
May 10.3	36.33	10	49.0	4	56.53	17	96.0	14	30.53	11	62.8	5	37.94	11	74.8	9
20.3	36.23	10	49.5	5	56.35	18	97.0	10	30.42	11	63.0	2	37.83	11	75.7	9
30.3	36.13	10	50.0	5	56.16	19	97.7	7	30.31	11	62.9	1	37.72	11	76.4	7
June 9.2	36.03	10	50.6	6	55.97	19	98.1	4	30.19	12	62.5	4	37.61	11	77.0	6
19.2	35.94	9	51.2	6	55.80	17	98.1	0	30.08	11	61.9	6	37.50	11	77.4	4
29.2	35.86	8	51.8	6	55.64	16	97.7	4	29.97	11	61.1	8	37.40	10	77.6	2
July 9.2	35.78	8	52.3	5	55.51	13	96.9	8	29.88	9	60.1	10	37.32	8	77.7	1
19.1	35.72	6	52.8	5	55.39	12	95.8	11	29.80	8	58.9	12	37.25	7	77.5	2
29.1	35.68	4	53.2	4	55.31	8	94.4	14	29.73	7	57.6	13	37.20	5	77.1	4
Aug. 8.1	35.66	2	53.6	4	55.25	6	92.6	18	29.69	4	56.2	14	37.17	3	76.6	5
18.1	35.66	0	53.8	2	55.22	3	90.6	20	29.67	2	54.7	15	37.16	1	75.8	8
28.0	35.68	2	53.9	1	55.23	1	88.3	23	29.68	1	53.3	14	37.18	2	74.8	10
Sept. 7.0	35.73	5	53.8	1	55.29	6	85.8	25	29.72	4	52.0	13	37.22	4	73.6	12
17.0	35.81	8	53.5	3	55.38	9	83.1	27	29.79	7	50.9	11	37.30	8	72.2	14
26.9	35.93	12	53.0	5	55.52	14	80.3	28	29.91	12	50.0	9	37.42	12	70.6	16
Oct. 6.9	36.08	15	52.2	8	55.71	19	77.4	29	30.06	15	49.4	6	37.57	15	68.8	18
16.9	36.27	19	51.2	10	55.94	23	74.5	29	30.26	20	49.1	3	37.76	19	66.8	20
26.9	36.50	23	49.9	13	56.22	28	71.6	29	30.50	24	49.2	1	37.99	23	64.7	21
Nov. 5.8	36.76	26	48.3	16	56.55	33	68.8	28	30.77	27	49.7	5	38.26	27	62.4	23
15.8	37.05	29	46.5	18	56.91	36	66.2	26	31.08	31	50.7	10	38.56	30	60.1	23
25.8	37.36	31	44.5	20	57.31	40	63.8	24	31.41	33	52.1	14	38.88	32	57.8	23
Dec. 5.8	37.69	33	42.4	21	57.73	42	61.7	21	31.76	35	53.9	18	39.23	35	55.6	22
15.7	38.03	34	40.2	22	58.16	43	60.0	17	32.12	36	55.9	20	39.58	35	53.5	21
25.7	38.37	34	38.0	22	58.59	43	58.7	13	32.47	35	58.3	24	39.94	36	51.6	19
35.7	38.69	32	35.9	21	59.01	42	57.8	9	32.81	34	60.9	26	40.28	34	50.0	16
Sec δ, Tan δ	1.001		+0.042		1.413		+0.998		1.081		−0.411		1.071		+0.384	
ean Place	34ˢ.123		62″.26		53ˢ.468		95″.81		28ˢ.530		42″.15		35ˢ.433		82″.42	
Dψ a, Dω a	0.00		0.00		+0.01		+0.06		0.00		−0.03		0.00		+0.02	
Dψ δ, Dω δ	−0.4		+0.2		−0.4		+0.2		−0.4		+0.2		−0.4		+0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*θ* **Leonis.** Mag. 3.4				*ν* **Ursæ Majoris.** Mag. 3.7				*δ* **Crateris.** Mag. 3.8				*σ* **Leonis.** Mag. 4.1		
	Right Ascension.		**Declination N.**		**Right Ascension.**		**Declination N.**		**Right Ascension.**		**Declination S.**		**Right Ascension.**		**Declina- tion N.**
	h m		° ′		h m		° ′		h m		° ′		h m		°
	11 9		+15 53		11 13		+33 32		11 15		−14 19		11 16		+ 6
	s		″		s		″		s		″		s		″
Jan. 0.7	48.09		31.1		54.99		76.1		6.29		5.0		46.35		37.7
10.7	48.41	32	29.5	16	55.35	36	75.1	10	6.61	32	7.5	25	46.67	32	35.8
20.6	48.71	30	28.1	14	55.68	33	74.5	6	6.90	29	10.0	25	46.96	29	34.0
30.6	48.97	26	27.1	10	55.97	29	74.3	2	7.15	25	12.4	24	47.22	26	32.5
Feb. 9.6	49.19	22	26.4	7	56.22	25	74.6	3	7.36	21	14.6	22	47.44	22	31.3
19.6	49.36	17	26.0	4	56.41	19	75.2	6	7.53	17	16.7	21	47.61	17	30.4
Mar. 1.5	49.48	12	26.0	0	56.55	14	76.2	10	7.65	12	18.6	19	47.73	12	29.7
11.5	49.55	7	26.2	2	56.64	9	77.4	12	7.72	7	20.2	16	47.81	8	29.3
21.5	49.58	3	26.6	4	56.67	3	78.8	14	7.75	3	21.6	14	47.85	4	29.2
31.4	49.58	0	27.2	6	56.65	2	80.4	16	7.75	0	22.8	12	47.85	0	29.3
Apr. 10.4	49.54	4	27.9	7	56.60	5	82.0	16	7.72	3	23.7	9	47.82	3	29.5
20.4	49.47	7	28.7	8	56.51	9	83.5	15	7.66	6	24.3	6	47.76	6	29.9
30.4	49.38	9	29.6	9	56.40	11	84.9	14	7.59	7	24.7	4	47.69	7	30.4
May 10.3	49.28	10	30.4	8	56.28	12	86.2	13	7.50	9	24.9	2	47.60	9	31.0
20.3	49.18	10	31.2	8	56.14	14	87.3	11	7.40	10	24.8	1	47.51	9	31.5
30.3	49.07	11	31.9	7	56.00	14	88.1	8	7.29	11	24.6	2	47.41	10	32.1
June 9.3	48.96	11	32.5	6	55.86	14	88.6	5	7.19	10	24.2	4	47.31	10	32.7
19.2	48.86	10	32.9	4	55.73	13	88.9	3	7.09	10	23.6	6	47.22	9	33.3
29.2	48.77	9	33.2	3	55.61	12	88.8	1	6.99	10	22.8	8	47.13	9	33.8
July 9.2	48.69	8	33.4	2	55.50	11	88.5	3	6.91	8	21.9	9	47.05	8	34.3
19.1	48.63	6	33.5	1	55.41	9	87.9	6	6.83	8	20.9	10	46.99	6	34.6
29.1	48.58	5	33.3	2	55.34	7	87.0	9	6.77	6	19.9	10	46.94	5	34.9
Aug. 8.1	48.55	3	33.0	3	55.29	5	85.8	12	6.73	4	18.8	11	46.90	4	35.1
18.1	48.54	1	32.5	5	55.27	2	84.4	14	6.71	2	17.8	10	46.89	1	35.1
28.0	48.56	2	31.8	7	55.28	1	82.7	17	6.72	1	16.8	10	46.90	1	34.9
Sept. 7.0	48.61	5	30.9	9	55.32	4	80.8	19	6.75	3	15.9	9	46.94	4	34.6
17.0	48.69	8	29.8	11	55.40	8	78.7	21	6.82	7	15.2	7	47.01	7	34.0
27.0	48.80	11	28.5	13	55.51	11	76.4	23	6.93	11	14.8	4	47.11	10	33.2
Oct. 6.9	48.95	15	27.0	15	55.67	16	74.0	24	7.07	14	14.6	2	47.25	14	32.2
16.9	49.13	18	25.2	18	55.87	20	71.4	26	7.25	18	14.7	1	47.43	18	31.0
26.9	49.36	23	23.3	19	56.11	24	68.8	26	7.48	23	15.2	5	47.64	21	29.5
Nov. 5.8	49.62	26	21.2	21	56.39	28	66.2	26	7.74	26	16.0	8	47.89	25	27.8
15.8	49.91	29	19.1	21	56.71	32	63.6	26	8.03	29	17.2	12	48.18	29	25.8
25.8	50.23	32	16.8	23	57.06	35	61.2	24	8.35	32	18.8	16	48.49	31	23.8
Dec. 5.8	50.57	34	14.6	22	57.43	37	59.0	22	8.69	34	20.7	19	48.82	33	21.6
15.7	50.92	35	12.5	21	57.81	38	57.0	20	9.03	34	22.8	21	49.16	34	19.4
25.7	51.27	35	10.5	20	58.20	39	55.3	17	9.37	34	25.1	23	49.50	34	17.3
35.7	51.60	33	8.7	18	58.57	37	54.0	13	9.71	34	27.5	24	49.83	33	15.2
Sec δ, Tan δ	1.040		+0.285		1.200		+0.663		1.032		−0.255		1.006		+0.114
Mean Place	$46^s.859$		39″.62		$53^s.502$		89″.97		$5^s.381$		6″.26		$45^s.270$		43″.50
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		+0.02		0.00		+0.04		0.00		−0.02		0.00		+0.01
$D'_\psi \delta$, $D_\omega \delta$	−0.4		+0.2		−0.4		+0.2		−0.4		+0.2		−0.4		+0.2

an Solar Date.	**π Centauri.** Mag. 4.3				**ι Leonis.** Mag. 4.0				**τ Leonis.** Mag. 5.2				**λ Draconis.** Mag. 4.1			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 11 17		° ′ −54 1		h m 11 19		° ′ +10 59		h m 11 23		° ′ + 3 19		h m 11 26		° ′ +69 47	
	s		″		s		″		s		″		s		″	
n. 0.7	8.17	43	17.7	28	30.75	32	44.0	19	35.00	32	23.3	20	25.59	74	40.0	1
10.7	8.60	39	20.5	31	31.07	30	42.1	16	35.32	29	21.3	19	26.33	68	40.1	7
20.6	8.99	34	23.6	34	31.37	26	40.5	13	35.61	26	19.4	17	27.01	60	40.8	12
30.6	9.33	28	27.0	36	31.63	22	39.2	10	35.87	22	17.7	14	27.61	51	42.0	18
b. 9.6	9.61	20	30.6	36	31.85	18	38.2	7	36.09	18	16.3	11	28.12	39	43.8	22
19.6	9.81	14	34.2	36	32.03	13	37.5	3	36.27	13	15.2	9	28.51	27	46.0	25
ar. 1.5	9.95	8	37.8	35	32.16	8	37.2	1	36.40	8	14.3	6	28.78	15	48.5	28
11.5	10.03	1	41.3	33	32.24	5	37.1	1	36.48	5	13.7	3	28.93	3	51.3	28
21.5	10.04	4	44.6	31	32.29	0	37.2	3	36.53	1	13.4	1	28.96	10	54.1	28
31.4	10.00	9	47.7	28	32.29	3	37.5	5	36.54	2	13.3	1	28.86	20	56.9	27
pr. 10.4	9.91	14	50.5	25	32.26	5	38.0	6	36.52	5	13.4	2	28.66	29	59.6	25
20.4	9.77	17	53.0	21	32.21	8	38.6	7	36.47	7	13.6	4	28.37	37	62.1	21
30.4	9.60	19	55.1	17	32.13	9	39.3	7	36.40	8	14.0	5	28.00	43	64.2	17
lay 10.3	9.41	22	56.8	13	32.04	10	40.0	7	36.32	9	14.5	5	27.57	47	65.9	12
20.3	9.19	24	58.1	7	31.94	10	40.7	7	36.23	10	15.0	6	27.10	49	67.1	7
30.3	8.95	24	58.8	3	31.84	10	41.4	6	36.13	10	15.6	6	26.61	50	67.8	2
une 9.3	8.71	24	59.1	1	31.74	9	42.0	6	36.03	9	16.2	5	26.11	49	68.0	3
19.2	8.47	24	59.0	6	31.65	9	42.6	4	35.94	9	16.7	6	25.62	46	67.7	8
29.2	8.23	23	58.4	11	31.56	8	43.0	3	35.85	8	17.3	5	25.16	43	66.9	13
uly 9.2	8.00	20	57.3	15	31.48	7	43.3	3	35.77	7	17.8	5	24.73	38	65.6	18
19.1	7.80	18	55.8	18	31.41	6	43.6	1	35.70	5	18.3	4	24.35	32	63.8	23
29.1	7.62	15	54.0	22	31.35	3	43.7	1	35.65	4	18.7	3	24.03	26	61.5	26
ug. 8.1	7.47	10	51.8	24	31.32	2	43.6	2	35.61	2	19.0	2	23.77	19	58.9	29
18.1	7.37	6	49.4	25	31.30	1	43.4	5	35.59	0	19.2	0	23.58	11	56.0	32
28.0	7.31	0	46.9	25	31.31	4	42.9	6	35.59	3	19.2	2	23.47	3	52.8	35
ept. 7.0	7.31	6	44.4	25	31.35	7	42.3	8	35.62	6	19.0	3	23.44	6	49.3	35
17.0	7.37	13	41.9	24	31.42	10	41.5	10	35.68	10	18.7	6	23.50	15	45.8	37
27.0	7.50	19	39.5	22	31.52	14	40.5	13	35.78	13	18.1	9	23.65	24	42.1	37
ct. 6.9	7.69	26	37.3	17	31.66	17	39.2	15	35.91	18	17.2	11	23.89	34	38.4	36
16.9	7.95	32	35.6	14	31.83	22	37.7	17	36.09	21	16.1	13	24.23	43	34.8	34
26.9	8.27	38	34.2	8	32.05	25	36.0	19	36.30	24	14.8	16	24.66	52	31.4	32
Nov. 5.8	8.65	43	33.4	2	32.30	28	34.1	21	36.54	28	13.2	18	25.18	59	28.2	29
15.8	9.08	47	33.2	3	32.58	31	32.0	22	36.82	31	11.4	20	25.77	67	25.3	25
25.8	9.55	49	33.5	9	32.89	34	29.8	22	37.13	33	9.4	22	26.44	72	22.8	20
Dec. 5.8	10.04	49	34.4	15	33.23	34	27.6	22	37.46	34	7.2	22	27.16	75	20.8	15
15.7	10.53	48	35.9	21	33.57	34	25.4	21	37.80	34	5.0	22	27.91	77	19.3	9
25.7	11.01	47	38.0	25	33.91	34	23.3	19	38.14	32	2.8	21	28.68	75	18.4	3
35.7	11.48		40.5		34.25		21.4		38.46		0.7		29.43		18.1	
ec δ, Tan δ	1.702		−1.377		1.019		+0.194		1.002		+0.058		2.895		+2.717	
ean Place	7ˢ.546		30″.24		29ˢ.634		51″.30		33ˢ.984		28″.29		22ˢ.439		61″.25	
$_{\psi}\alpha$, $D_{\omega}\alpha$	−0.01		+0.09		0.00		+0.01		0.00		0.00		+0.01		+0.18	
$_{\psi}\delta$, $D_{\omega}\delta$	−0.4		+0.2		−0.4		+0.2		−0.4		+0.2		−0.4		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ξ Hydræ. Mag. 3.7				λ Centauri. Mag. 3.3				υ Leonis. Mag. 4.5				π Chamæleontis Mag. 5.7		
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.
	h m 11 28		° ′ −31 23		h m 11 31		° ′ −62 32		h m 11 32		° ′ − 0 21		h m 11 33		° −75
	s		″		s		″		s		″		s		″
Jan. 0.7	49.82		7.8		51.53		44.0		36.73		19.6		44.87		17.7
10.7	50.17	35	10.5	27	52.07	54	46.6	26	37.05	32	21.8	22	45.77	90	20.0
20.6	50.49	32	13.3	28	52.56	49	49.6	30	37.35	30	23.8	20	46.58	81	22.9
30.6	50.77	28	16.2	29	52.99	43	52.9	33	37.61	26	25.6	18	47.27	69	26.2
Feb. 9.6	51.00	23	19.1	29	53.34	35	56.4	35	37.84	23	27.2	16	47.84	57	29.7
19.6	51.19	19	22.0	29	53.61	27	60.1	37	38.02	18	28.6	14	48.28	44	33.5
Mar. 1.5	51.33	14	24.8	28	53.80	19	63.9	38	38.16	14	29.7	11	48.57	29	37.4
11.5	51.42	9	27.4	26	53.92	12	67.6	37	38.26	10	30.5	8	48.72	15	41.3
21.5	51.46	4	29.7	23	53.95	3	71.2	36	38.31	5	31.1	6	48.74	2	45.2
31.5	51.47	1	31.8	21	53.91	4	74.7	35	38.33	2	31.4	3	48.62	12	48.9
Apr. 10.4	51.44	3	33.7	19	53.81	10	77.9	32	38.31	2	31.5	1	48.39	23	52.5
20.4	51.38	6	35.2	15	53.65	16	80.7	28	38.27	4	31.4	1	48.05	34	55.7
30.4	51.30	8	36.4	12	53.44	21	83.2	25	38.21	6	31.2	2	47.61	44	58.6
May 10.3	51.20	10	37.3	9	53.19	25	85.3	21	38.14	7	30.9	3	47.08	53	61.1
20.3	51.08	12	37.9	6	52.91	28	87.0	17	38.05	9	30.5	4	46.49	59	63.1
30.3	50.96	12	38.2	3	52.60	31	88.1	11	37.96	9	29.9	6	45.84	65	64.7
June 9.3	50.83	13	38.1	1	52.27	33	88.8	7	37.87	9	29.4	5	45.15	69	65.7
19.2	50.70	13	37.7	4	51.94	33	89.0	2	37.77	10	28.8	6	44.44	71	66.2
29.2	50.57	13	37.0	7	51.60	34	88.7	3	37.68	9	28.2	6	43.72	72	66.1
July 9.2	50.45	12	36.0	10	51.27	33	87.9	8	37.60	8	27.6	6	43.03	69	65.5
19.2	50.34	11	34.8	12	50.97	30	86.6	13	37.52	8	27.0	6	42.37	66	64.4
29.1	50.25	9	33.4	14	50.69	28	84.8	18	37.46	6	26.5	5	41.77	60	62.8
Aug. 8.1	50.17	8	31.8	16	50.46	23	82.8	20	37.41	5	26.0	5	41.26	51	60.7
18.1	50.12	5	30.1	17	50.28	18	80.4	24	37.39	2	25.7	3	40.84	42	58.3
28.0	50.10	2	28.3	18	50.16	12	77.8	26	37.38	1	25.4	3	40.55	29	55.6
Sept. 7.0	50.11	1	26.6	17	50.11	5	75.1	27	37.40	2	25.4	0	40.39	16	52.7
17.0	50.16	5	25.0	16	50.14	3	72.3	28	37.46	6	25.5	1	40.38	1	49.7
27.0	50.26	10	23.6	14	50.25	11	69.6	27	37.55	9	25.9	4	40.53	15	46.8
Oct. 6.9	50.40	14	22.5	11	50.45	20	67.1	25	37.67	12	26.5	6	40.83	30	44.0
16.9	50.58	18	21.7	8	50.74	29	65.0	21	37.83	16	27.4	9	41.30	47	41.5
26.9	50.82	24	21.3	4	51.11	37	63.2	18	38.04	21	28.6	12	41.92	62	39.3
Nov. 5.9	51.10	28	21.3	0	51.56	45	62.0	12	38.28	24	30.0	14	42.66	74	37.7
15.8	51.41	31	21.8	5	52.07	51	61.2	8	38.55	27	31.7	17	43.52	86	36.5
25.8	51.75	34	22.8	10	52.63	56	61.1	1	38.85	30	33.6	19	44.46	94	36.0
Dec. 5.8	52.12	37	24.2	14	53.22	59	61.6	5	39.18	33	35.7	21	45.45	99	36.2
15.7	52.50	38	26.0	18	53.82	60	62.8	12	39.52	34	37.9	22	46.45	100	37.0
25.7	52.87	37	28.2	22	54.41	59	64.5	17	39.86	34	40.1	22	47.44	99	38.4
35.7	53.23	36	30.7	25	54.98	57	66.8	23	40.19	33	42.3	22	48.39	95	40.4
Sec δ, Tan δ	1.172		−0.610		2.169		−1.925		1.000		−0.006		3.975		−3.847
Mean Place	49^s.112		14″.19		51^s.141		58″.03		35^s.798		15″.61		44^s.826		33″.58
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		−0.04		−0.01		−0.13		0.00		0.00		−0.01		−0.25
$D_\psi \delta$, $D_\omega \delta$	−0.4		+0.1		−0.4		+0.1		−0.4		+0.1		−0.4		+0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	**3 Draconis.** Mag. 5.5				**ζ Crateris.** Mag. 4.9				**χ Ursæ Majoris.** Mag. 3.8				**β Leonis.** (*Denebola.*) Mag. 2.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	11 37		+67 12		11 40		−17 52		11 41		+48 14		11 44		+15 2	
	s		″		s		″		s		″		s		″	
n. 0.7	47.31		33.8		27.89		39.5		35.70		43.9		44.54		40.5	
10.7	47.98	67	33.6	2	28.23	34	42.0	25	36.14	44	43.1	8	44.87	33	38.7	18
20.7	48.61	63	34.1	5	28.54	31	44.5	25	36.55	41	42.8	3	45.19	32	37.2	15
30.6	49.18	57	35.2	11	28.81	27	47.0	25	36.92	37	43.1	3	45.47	28	36.0	12
b. 9.6	49.66	48	36.8	16	29.05	24	49.3	23	37.24	32	43.9	8	45.71	24	35.1	9
19.6	50.04	38	38.8	20	29.24	19	51.6	23	37.50	26	45.2	13	45.91	20	34.6	5
ar. 1.5	50.32	28	41.2	24	29.38	14	53.7	21	37.69	19	46.8	16	46.07	16	34.4	2
11.5	50.48	16	43.9	27	29.49	11	55.5	18	37.82	13	48.7	19	46.18	11	34.5	1
21.5	50.53	5	46.7	28	29.55	6	57.1	16	37.88	6	50.9	22	46.24	6	34.9	4
31.5	50.48	5	49.5	28	29.58	3	58.5	14	37.89	1	53.1	22	46.27	3	35.5	6
pr. 10.4	50.33	15	52.2	27	29.57	1	59.6	11	37.84	5	55.4	23	46.26	1	36.2	7
20.4	50.10	23	54.7	25	29.53	4	60.5	9	37.74	10	57.5	21	46.22	4	37.1	9
30.4	49.80	30	56.9	22	29.47	6	61.1	6	37.60	14	59.5	20	46.16	6	38.0	9
ay 10.4	49.44	36	58.7	18	29.40	7	61.5	4	37.44	16	61.2	17	46.09	7	38.9	9
20.3	49.04	40	60.1	14	29.31	9	61.7	2	37.25	19	62.6	14	46.00	9	39.8	9
30.3	48.62	42	61.0	9	29.21	10	61.6	1	37.05	20	63.7	11	45.90	10	40.6	8
ne 9.3	48.19	43	61.4	4	29.11	10	61.3	3	36.85	20	64.4	7	45.80	10	41.4	8
19.2	47.76	43	61.3	1	29.01	10	60.9	4	36.65	20	64.7	3	45.69	11	42.0	6
29.2	47.35	41	60.6	7	28.91	10	60.2	7	36.46	19	64.5	2	45.59	10	42.4	4
ly 9.2	46.97	38	59.5	11	28.81	10	59.4	8	36.28	18	64.0	5	45.50	9	42.7	3
19.2	46.62	35	57.9	16	28.72	9	58.4	10	36.11	17	63.0	10	45.41	9	42.9	2
29.1	46.32	30	55.9	20	28.64	8	57.4	10	35.97	14	61.7	13	45.34	7	42.8	1
ug. 8.1	46.07	25	53.4	25	28.58	6	56.3	11	35.86	11	60.0	17	45.28	6	42.6	2
18.1	45.88	19	50.6	28	28.54	4	55.1	12	35.78	8	58.0	20	45.24	4	42.2	4
28.1	45.76	12	47.5	31	28.52	2	54.0	11	35.73	5	55.6	24	45.22	2	41.6	6
ept. 7.0	45.71	5	44.2	33	28.53	1	53.0	10	35.72	1	53.0	26	45.23	1	40.7	9
17.0	45.74	3	40.7	35	28.57	4	52.1	9	35.76	4	50.2	28	45.27	4	39.7	10
27.0	45.85	11	37.1	36	28.65	8	51.4	7	35.84	8	47.2	30	45.35	8	38.4	13
ct. 6.9	46.04	19	33.5	36	28.77	12	51.0	4	35.97	13	44.1	31	45.46	11	36.8	16
16.9	46.32	28	29.8	37	28.93	16	50.9	1	36.16	19	40.9	32	45.61	15	35.1	17
26.9	46.68	36	26.3	35	29.14	21	51.2	3	36.40	24	37.7	32	45.80	19	33.1	20
ov. 5.9	47.12	44	23.0	33	29.39	25	51.8	6	36.69	29	34.6	31	46.03	23	31.0	21
15.8	47.64	52	20.0	30	29.67	28	52.7	9	37.04	35	31.6	30	46.30	27	28.8	22
25.8	48.23	59	17.4	26	29.98	31	54.1	14	37.42	38	28.9	27	46.60	30	26.5	23
ec. 5.8	48.87	64	15.2	22	30.32	34	55.8	17	37.84	42	26.5	24	46.93	33	24.2	23
15.8	49.55	68	13.5	17	30.67	35	57.7	19	38.28	44	24.4	21	47.27	34	21.9	23
25.7	50.24	69	12.3	12	31.02	35	59.9	22	38.73	45	22.8	16	47.62	35	19.8	21
35.7	50.92	68	11.8	5	31.37	35	62.3	24	39.18	45	21.7	11	47.96	34	17.8	20
c δ, Tan δ	2.582		+2.380		1.051		−0.323		1.502		+1.120		1.035		+0.269	
ean Place	44ˢ.648		55″.43		27ˢ.154		41″.26		34ˢ.089		62″.66		43ˢ.528		50″.16	
ϕa, D∞ a	+0.01		+0.16		0.00		−0.02		0.00		+0.07		0.00		+0.02	
ϕδ, D∞ δ	−0.4		+0.1		−0.4		+0.1		−0.4		+0.1		−0.4		+0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Virginis. Mag. 3.8 Right Ascension.		β Virginis. Declination N.		Groombridge 1830. Mag. 6.5 Right Ascension.		Groombridge 1830. Declination N.		γ Ursæ Majoris. Mag. 2.5 Right Ascension.		γ Ursæ Majoris. Declination N.		π Virginis. Mag. 4.6 Right Ascension.		π Virginis. Decli- tion N.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	11 46		+ 2 14		11 48		+38 18		11 49		+54 9		11 56		+ 7
	s		″		s		″		s		″		s		″
Jan. 0.7	16.93		32.4		6.39		87.0		23.74		42.2		31.89		70.5
10.7	17.26	33	30.2	22	6.79	40	85.6	14	24.23	49	41.5	7	32.22	33	68.4
20.7	17.57	31	28.3	19	7.17	38	84.8	8	24.68	45	41.4	1	32.53	31	66.6
30.6	17.85	28	26.5	18	7.51	34	84.4	4	25.10	42	41.8	4	32.82	29	65.1
Feb. 9.6	18.08	23	25.0	15	7.81	30	84.6	2	25.46	36	42.8	10	33.07	25	63.8
19.6	18.28	20	23.8	12	8.06	25	85.1	5	25.76	30	44.3	15	33.27	20	62.8
Mar. 1.6	18.44	16	22.9	9	8.25	19	86.1	10	25.98	22	46.1	18	33.44	17	62.1
11.5	18.55	11	22.2	7	8.38	13	87.4	13	26.13	15	48.3	22	33.56	12	61.8
21.5	18.62	7	21.8	4	8.46	8	88.9	15	26.20	7	50.7	24	33.64	8	61.7
31.5	18.65	3	21.6	2	8.49	3	90.6	17	26.21	1	53.1	24	33.68	4	61.8
Apr. 10.4	18.65	0	21.6	0	8.48	1	92.3	17	26.16	5	55.6	25	33.68	0	62.1
20.4	18.62	3	21.8	2	8.42	6	94.0	17	26.05	11	58.0	24	33.66	2	62.6
30.4	18.57	5	22.2	4	8.34	8	95.6	16	25.89	16	60.1	21	33.62	4	63.2
May 10.4	18.51	6	22.6	4	8.23	11	97.1	15	25.69	20	62.0	19	33.55	7	63.8
20.3	18.43	8	23.1	5	8.10	13	98.3	12	25.47	22	63.5	15	33.48	7	64.5
30.3	18.34	9	23.7	6	7.96	14	99.3	10	25.24	23	64.7	12	33.39	9	65.2
June 9.3	18.25	9	24.3	6	7.82	14	99.9	6	24.99	25	65.4	7	33.30	9	65.9
19.3	18.16	9	24.9	6	7.68	14	100.2	3	24.75	24	65.6	2	33.20	10	66.6
29.2	18.07	9	25.5	6	7.54	14	100.2	0	24.51	24	65.4	2	33.11	9	67.1
July 9.2	17.98	9	26.0	5	7.41	13	99.8	4	24.29	22	64.8	6	33.02	9	67.6
19.2	17.91	7	26.5	5	7.29	12	99.1	7	24.08	21	63.7	11	32.94	8	68.0
29.1	17.84	7	26.9	4	7.19	10	98.0	11	23.90	18	62.3	14	32.86	8	68.3
Aug. 8.1	17.78	6	27.2	3	7.11	8	96.6	14	23.75	15	60.4	19	32.80	6	68.4
18.1	17.75	3	27.4	2	7.05	6	94.9	17	23.63	12	58.1	23	32.75	5	68.4
28.1	17.73	2	27.5	1	7.02	3	92.9	20	23.55	8	55.6	25	32.72	3	68.2
Sept. 7.0	17.74	1	27.4	1	7.02	0	90.6	23	23.52	3	52.7	29	32.73	1	67.8
17.0	17.78	4	27.1	3	7.07	5	88.1	25	23.54	2	49.7	30	32.75	2	67.2
27.0	17.86	8	26.6	5	7.15	8	85.4	27	23.61	7	46.5	32	32.82	7	66.4
Oct. 7.0	17.97	11	25.8	8	7.27	12	82.5	29	23.74	13	43.1	34	32.92	10	65.3
16.9	18.12	15	24.8	10	7.44	17	79.5	30	23.93	19	39.7	34	33.06	14	64.0
26.9	18.31	19	23.5	13	7.66	22	76.4	31	24.18	25	36.4	33	33.24	18	62.5
Nov. 5.9	18.54	23	21.9	16	7.93	27	73.4	30	24.49	31	33.1	33	33.46	22	60.7
15.8	18.81	27	20.1	18	8.24	31	70.3	31	24.85	36	30.0	31	33.72	26	58.8
25.8	19.11	30	18.2	19	8.58	34	67.4	29	25.27	42	27.2	28	34.01	29	56.7
Dec. 5.8	19.43	32	16.0	22	8.96	38	64.8	26	25.72	45	24.7	25	34.33	32	54.4
15.8	19.77	34	13.8	22	9.36	40	62.4	24	26.20	48	22.6	21	34.66	33	52.2
25.7	20.11	34	11.6	22	9.77	41	60.4	20	26.69	49	21.1	15	35.00	34	50.0
35.7	20.45	34	9.4	22	10.18	41	58.8	16	27.19	50	20.0	11	35.34	34	47.9
Sec δ, Tan δ	1.001		+0.039		1.275		+0.790		1.708		+1.385		1.008		+0.124
Mean Place	$16^{s}.060$		37″.73		$5^{s}.075$		103″.70		$22^{s}.014$		62″.51		$31^{s}.032$		77″.87
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		0.00		0.00		+0.05		0.00		+0.09		0.00		+0.01
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.4		+0.1		−0.4		+0.1		−0.4		0.0		−0.4		0.0

ean Solar Date.	**ο Virginis.** Mag. 4.2				**δ Centauri.** Mag. 2.9				**ε Corvi.** Mag. 3.2				**4 H. Draconis.** Mag. 5.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ʹ		h m		° ʹ		h m		° ʹ		h m		° ʹ	
	12 0		+ 9 11		12 3		−50 14		12 5		−22 8		12 8		+78 4	
	s		″		s		″		s		″		s		″	
an. 0.7	53.64	34	69.7	20	57.07	45	46.2	23	45.60	35	47.0	24	17.60	117	54.7	2
10.7	53.98	31	67.7	18	57.52	42	48.5	27	45.95	33	49.4	25	18.77	113	54.5	4
20.7	54.29	29	65.9	15	57.94	38	51.2	30	46.28	30	51.9	25	19.90	104	54.9	10
30.6	54.58	25	64.4	11	58.32	33	54.2	32	46.58	26	54.4	25	20.94	91	55.9	17
eb. 9.6	54.83	21	63.3	9	58.65	27	57.4	33	46.84	22	56.9	24	21.85	76	57.6	21
19.6	55.04	17	62.4	5	58.92	22	60.7	34	47.06	17	59.3	22	22.61	58	59.7	25
ar. 1.6	55.21	13	61.9	3	59.14	15	64.1	33	47.23	13	61.5	21	23.19	38	62.2	28
11.5	55.34	8	61.6	0	59.29	10	67.4	32	47.36	9	63.6	19	23.57	17	65.0	30
21.5	55.42	4	61.6	3	59.39	5	70.6	30	47.45	6	65.5	16	23.74	2	68.0	30
31.5	55.46	2	61.9	4	59.44	0	73.6	29	47.51	2	67.1	14	23.72	22	71.0	30
pr. 10.5	55.48	2	62.3	6	59.44	5	76.5	25	47.53	1	68.5	11	23.50	39	74.0	28
20.4	55.46	5	62.9	7	59.39	8	79.0	22	47.52	4	69.6	9	23.11	54	76.8	25
30.4	55.41	6	63.6	8	59.31	12	81.2	19	47.48	6	70.5	6	22.57	68	79.3	21
ay 10.4	55.35	7	64.4	8	59.19	14	83.1	16	47.42	8	71.1	4	21.89	78	81.4	16
20.3	55.28	9	65.2	7	59.05	17	84.7	11	47.34	8	71.5	2	21.11	85	83.0	12
30.3	55.19	9	65.9	7	58.88	18	85.8	6	47.26	10	71.7	1	20.26	90	84.2	6
une 9.3	55.10	10	66.6	7	58.70	20	86.4	3	47.16	11	71.6	3	19.36	92	84.8	0
19.3	55.00	10	67.3	6	58.50	21	86.7	2	47.05	10	71.3	5	18.44	91	84.8	5
29.2	54.90	9	67.9	4	58.29	21	86.5	6	46.95	11	70.8	8	17.53	88	84.3	10
uly 9.2	54.81	9	68.3	4	58.08	20	85.9	10	46.84	11	70.0	9	16.65	83	83.3	15
19.2	54.72	8	68.7	2	57.88	18	84.9	14	46.73	9	69.1	10	15.82	76	81.8	21
29.2	54.64	6	68.9	0	57.70	17	83.5	17	46.64	9	68.1	12	15.06	67	79.7	25
ug. 8.1	54.58	5	68.9	1	57.53	14	81.8	20	46.55	7	66.9	12	14.39	56	77.2	28
18.1	54.53	3	68.8	3	57.39	10	79.8	22	46.48	4	65.7	12	13.83	45	74.4	32
28.1	54.50	1	68.5	5	57.29	6	77.6	23	46.44	2	64.5	12	13.38	31	71.2	35
ept. 7.0	54.49	2	68.0	7	57.23	0	75.3	23	46.42	2	63.3	11	13.07	17	67.7	37
17.0	54.51	6	67.3	9	57.23	5	73.0	23	46.44	5	62.2	9	12.90	2	64.0	38
27.0	54.57	10	66.4	12	57.28	12	70.7	21	46.49	10	61.3	7	12.88	14	60.2	39
ct. 7.0	54.67	13	65.2	14	57.40	18	68.6	18	46.59	14	60.6	4	13.02	29	56.3	38
16.9	54.80	18	63.8	17	57.58	25	66.8	15	46.73	19	60.2	1	13.31	46	52.5	38
26.9	54.98	22	62.1	18	57.83	31	65.3	11	46.92	23	60.1	3	13.77	62	48.7	35
ov. 5.9	55.20	25	60.3	21	58.14	37	64.2	6	47.15	27	60.4	7	14.39	77	45.2	32
15.9	55.45	29	58.2	22	58.51	41	63.6	0	47.42	31	61.1	10	15.16	90	42.0	29
25.8	55.74	32	56.0	22	58.92	45	63.6	5	47.73	34	62.1	14	16.06	102	39.1	24
Dec. 5.8	56.06	33	53.8	23	59.37	46	64.1	10	48.07	35	63.5	18	17.08	111	36.7	19
15.8	56.39	34	51.5	22	59.83	47	65.1	16	48.42	36	65.3	20	18.19	115	34.8	13
25.7	56.73	34	49.3	21	60.30	47	66.7	21	48.78	36	67.3	23	19.34	118	33.5	6
35.7	57.07		47.2		60.77		68.8		49.14		69.6		20.52		32.9	
ec δ, Tan δ	1.013		+0.162		1.564		−1.202		1.080		−0.407		4.843		+4.738	
ean Place	$52^{s}.794$		$77''.97$		$56^{s}.796$		$57''.05$		$45^{s}.044$		$49''.52$		$13^{s}.957$		$78''.74$	
$'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		+0.01		0.00		−0.08		0.00		−0.03		0.00		+0.32	
$_{\psi}\delta$, $D_{\omega}\delta$	−0.4		0.0		−0.4		0.0		−0.4		0.0		−0.4		0.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Crucis. Mag. 3.1				δ Ursæ Majoris. Mag. 3.4				γ Corvi. Mag. 2.8				2 Canum Venat Mag. 5.8		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decl tion N
	h m		° ′		h m		° ′		h m		° ′		h m		°
	12 10		−58 16		12 11		+57 29		12 11		−17 4		12 11		+41
	s		″		s		″		s		″		s		″
Jan. 0.7	37.79		22.7		15.23		55.7		26.51		11.2		53.49		41.0
10.7	38.32	53	24.8	21	15.76	53	54.8	9	26.85	34	13.5	23	53.90	41	39.7
20.7	38.81	49	27.4	26	16.26	50	54.6	2	27.18	33	15.9	24	54.29	39	38.9
30.6	39.26	45	30.4	30	16.72	46	54.9	3	27.47	29	18.3	24	54.64	35	38.6
Feb. 9.6	39.65	39	33.6	32	17.13	41	55.9	10	27.73	26	20.6	23	54.96	32	38.8
19.6	39.97	32	37.1	35	17.47	34	57.3	14	27.95	22	22.7	21	55.23	27	39.6
Mar. 1.6	40.23	26	40.6	35	17.74	27	59.2	19	28.13	18	24.7	20	55.44	21	40.7
11.5	40.42	19	44.1	35	17.94	20	61.4	22	28.27	14	26.5	18	55.60	16	42.2
21.5	40.54	12	47.6	35	18.05	11	63.9	25	28.37	10	28.1	16	55.70	10	44.0
31.5	40.60	6	50.9	33	18.09	4	66.5	26	28.43	6	29.4	13	55.75	5	46.0
Apr. 10.5	40.60	0	54.1	32	18.06	3	69.1	26	28.45	2	30.5	11	55.75	0	48.1
20.4	40.55	5	57.0	29	17.96	10	71.7	26	28.45	0	31.4	9	55.71	4	50.2
30.4	40.44	11	59.6	26	17.81	15	74.1	24	28.42	3	32.0	6	55.63	8	52.2
May 10.4	40.29	15	61.8	22	17.62	19	76.1	20	28.36	6	32.4	4	55.52	11	54.0
20.3	40.11	18	63.7	19	17.39	23	77.9	18	28.30	6	32.6	2	55.39	13	55.6
30.3	39.89	22	65.1	14	17.13	26	79.3	14	28.22	8	32.6	0	55.24	15	57.0
June 9.3	39.65	24	66.1	10	16.86	27	80.2	9	28.13	9	32.4	2	55.08	16	58.0
19.3	39.39	26	66.6	5	16.58	28	80.7	5	28.03	10	32.0	4	54.91	17	58.6
29.2	39.12	27	66.7	1	16.30	28	80.7	0	27.93	10	31.5	5	54.75	16	58.9
July 9.2	38.84	28	66.3	4	16.03	27	80.2	5	27.83	10	30.8	7	54.59	16	58.8
19.2	38.57	27	65.4	9	15.77	26	79.2	10	27.73	10	30.0	8	54.44	15	58.3
29.2	38.32	25	64.0	14	15.54	23	77.8	14	27.63	10	29.1	9	54.30	14	57.5
Aug. 8.1	38.09	23	62.3	17	15.33	21	76.0	18	27.55	8	28.1	10	54.18	12	56.3
18.1	37.89	20	60.3	20	15.16	17	73.8	22	27.49	6	27.1	10	54.08	10	54.7
28.1	37.74	15	58.0	23	15.03	13	71.2	26	27.44	5	26.1	10	54.00	8	52.9
Sept. 7.0	37.65	9	55.5	25	14.95	8	68.3	29	27.42	2	25.2	9	53.96	4	50.7
17.0	37.61	4	52.9	26	14.92	3	65.2	31	27.43	1	24.4	8	53.96	0	48.2
27.0	37.65	4	50.4	25	14.95	3	61.9	33	27.48	5	23.7	7	54.00	4	45.5
Oct. 7.0	37.77	12	47.9	25	15.04	9	58.4	35	27.57	9	23.3	4	54.08	8	42.7
16.9	37.97	20	45.7	22	15.19	15	54.9	35	27.70	13	23.2	1	54.21	13	39.7
26.9	38.25	28	43.9	18	15.41	22	51.3	36	27.88	18	23.4	2	54.39	18	36.6
Nov. 5.9	38.60	35	42.4	15	15.70	29	47.9	34	28.10	22	23.9	5	54.63	24	33.5
15.9	39.02	42	41.4	10	16.06	36	44.6	33	28.36	26	24.8	9	54.91	28	30.4
25.8	39.50	48	41.0	4	16.47	41	41.6	30	28.66	30	26.0	12	55.24	33	27.5
Dec. 5.8	40.02	52	41.2	2	16.93	46	38.9	27	28.98	32	27.5	15	55.60	36	24.8
15.8	40.56	54	41.9	7	17.43	50	36.6	23	29.33	35	29.4	19	55.99	39	22.4
25.7	41.11	55	43.3	14	17.95	52	34.9	17	29.68	35	31.5	21	56.40	41	20.3
35.7	41.66	55	45.1	18	18.47	52	33.6	13	30.03	35	33.7	22	56.81	41	18.7
Sec δ, Tan δ	1.902		−1.618		1.861		+1.570		1.046		−0.307		1.328		+0.87
Mean Place	37ˢ.713		35″.20		13ˢ.649		77″.54		25ˢ.941		11″.83		52ˢ.324		59″.40
D′ψ α, Dω α	0.00		−0.11		0.00		+0.10		0.00		−0.02		0.00		+0.06
δ, Dω δ	−0.4		0.0		−0.4		0.0		−0.4		0.0		−0.4		−0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	**β Chamæleontis.** Mag. 4.4				**η Virginis.** Mag. 4.0				**α¹ Crucis.** Mag. 1.6				**20 Comæ.** Mag. 5.7			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	12 13		−78 50		12 15		− 0 11		12 21		−62 37		12 25		+21 21	
	s		″		s		″		s		″		s		″	
an. 0.7	18.80	123	9.3	18	34.11	34	45.7	22	51.41	60	28.3	20	27.99	35	46.9	18
10.7	20.03	116	11.1	23	34.45	31	47.9	20	52.01	56	30.3	24	28.34	34	45.1	15
20.7	21.19	104	13.4	28	34.76	29	49.9	19	52.57	51	32.7	29	28.68	31	43.6	12
30.7	22.23	90	16.2	32	35.05	26	51.8	16	53.08	45	35.6	31	28.99	28	42.4	7
eb. 9.6	23.13	74	19.4	35	35.31	22	53.4	14	53.53	38	38.7	34	29.27	24	41.7	3
19.6	23.87	58	22.9	37	35.53	18	54.8	11	53.91	31	42.1	35	29.51	20	41.4	1
lar. 1.6	24.45	41	26.6	39	35.71	14	55.9	8	54.22	23	45.6	36	29.71	16	41.5	4
11.5	24.86	24	30.5	39	35.85	10	56.7	5	54.45	16	49.2	36	29.87	11	41.9	7
21.5	25.10	7	34.4	38	35.95	6	57.2	3	54.61	9	52.8	35	29.98	6	42.6	10
31.5	25.17	10	38.2	38	36.01	3	57.5	1	54.70	1	56.3	33	30.04	3	43.6	12
pr. 10.5	25.07	25	42.0	35	36.04	0	57.6	1	54.71	4	59.6	31	30.07	0	44.8	13
20.4	24.82	40	45.5	32	36.04	3	57.5	2	54.67	11	62.7	28	30.07	3	46.1	13
30.4	24.42	53	48.7	30	36.01	4	57.3	4	54.56	16	65.5	25	30.04	6	47.4	13
lay 10.4	23.89	65	51.7	25	35.97	6	56.9	5	54.40	20	68.0	21	29.98	7	48.7	13
20.4	23.24	75	54.2	21	35.91	8	56.4	5	54.20	25	70.1	17	29.91	9	50.0	11
30.3	22.49	83	56.3	16	35.83	8	55.9	6	53.95	28	71.8	12	29.82	10	51.1	10
une 9.3	21.66	90	57.9	10	35.75	9	55.3	6	53.67	30	73.0	8	29.72	11	52.1	8
19.3	20.76	93	58.9	5	35.66	9	54.7	6	53.37	32	73.8	2	29.61	11	52.9	6
29.2	19.83	94	59.4	0	35.57	10	54.1	6	53.05	33	74.0	2	29.50	11	53.5	4
uly 9.2	18.89	93	59.4	6	35.47	9	53.5	6	52.72	33	73.8	7	29.39	11	53.9	1
19.2	17.96	88	58.8	11	35.38	8	52.9	5	52.39	32	73.1	12	29.28	10	54.0	1
29.2	17.08	79	57.7	16	35.30	8	52.4	4	52.07	28	71.9	16	29.18	9	53.9	4
ug. 8.1	16.29	69	56.1	20	35.22	6	52.0	3	51.79	25	70.3	20	29.09	7	53.5	6
18.1	15.60	55	54.1	25	35.16	4	51.7	2	51.54	20	68.3	23	29.02	6	52.9	9
28.1	15.05	40	51.6	27	35.12	2	51.5	0	51.34	14	66.0	25	28.96	3	52.0	11
Sept. 7.1	14.65	21	48.9	29	35.10	1	51.5	1	51.20	7	63.5	26	28.93	1	50.9	14
17.0	14.44	1	46.0	30	35.11	4	51.6	4	51.13	2	60.9	27	28.92	3	49.5	16
27.0	14.43	20	43.0	30	35.15	9	52.0	6	51.15	10	58.2	26	28.95	7	47.9	19
Oct. 7.0	14.63	42	40.0	28	35.24	12	52.6	9	51.25	20	55.6	24	29.02	10	46.0	21
16.9	15.05	63	37.2	25	35.36	16	53.5	12	51.45	29	53.2	21	29.12	16	43.9	23
26.9	15.68	82	34.7	21	35.52	21	54.7	14	51.74	38	51.1	17	29.28	20	41.6	24
Nov. 5.9	16.50	98	32.6	17	35.73	24	56.1	16	52.12	45	49.4	12	29.48	24	39.2	26
15.9	17.48	112	30.9	11	35.97	28	57.7	19	52.57	52	48.2	7	29.72	28	36.6	26
25.8	18.60	122	29.8	5	36.25	31	59.6	20	53.09	57	47.5	1	30.00	31	34.0	25
Dec. 5.8	19.82	128	29.3	1	36.56	33	61.6	22	53.66	60	47.4	4	30.31	34	31.5	25
15.8	21.10	130	29.4	8	36.89	34	63.8	22	54.26	62	47.8	11	30.65	35	29.0	22
25.8	22.40	128	30.2	14	37.23	34	66.0	22	54.88	61	48.9	16	31.00	35	26.8	21
35.7	23.68		31.6		37.57		68.2		55.49		50.5		31.35		24.7	
ec δ, Tan δ	5.168		−5.070		1.000		−0.003		2.175		−1.932		1.074		+0.391	
lean Place	19ˢ.926		24″.94		33ˢ.429		40″.25		51ˢ.556		41″.44		27ˢ.180		60″.10	
$D_\psi\alpha$, $D_\omega\alpha$	+0.01		−0.34		0.00		0.00		0.00		−0.13		0.00		+0.03	
$\psi\delta$, $D_\omega\delta$	−0.4		−0.1		−0.4		−0.1		−0.4		−0.1		−0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Corvi. Mag. 3.1				γ Crucis. Mag. 1.6				8 Canum Venat. Mag. 4.3				κ Draconis. Mag. 3.9		
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	12 25		−16 2		12 26		−56 38		12 29		+41 48		12 29		+70
	s		″		s		″		s		″		s		″
Jan. 0.7	28.36	34	32.5	23	26.39	53	2.1	20	43.64	41	49.8	14	53.71	76	59.7
10.7	28.70	33	34.8	23	26.92	49	4.1	25	44.05	40	48.4	10	54.47	74	59.0
20.7	29.03	31	37.1	23	27.41	45	6.6	28	44.45	37	47.4	4	55.21	70	58.9
30.7	29.34	27	39.4	22	27.86	40	9.4	31	44.82	33	47.0	2	55.91	62	59.4
Feb. 9.6	29.61	23	41.6	21	28.26	34	12.5	32	45.15	28	47.2	6	56.53	54	60.6
19.6	29.84	19	43.7	19	28.60	28	15.7	34	45.43	23	47.8	11	57.07	43	62.3
Mar. 1.6	30.03	15	45.6	17	28.88	21	19.1	35	45.66	18	48.9	15	57.50	31	64.5
11.6	30.18	11	47.3	15	29.09	15	22.6	34	45.84	13	50.4	18	57.81	19	67.0
21.5	30.29	8	48.8	13	29.24	9	26.0	33	45.97	7	52.2	21	58.00	7	69.8
31.5	30.37	4	50.1	10	29.33	4	29.3	31	46.04	2	54.3	22	58.07	4	72.8
Apr. 10.5	30.41	1	51.1	8	29.37	2	32.4	29	46.06	3	56.5	21	58.03	16	75.7
20.4	30.42	2	51.9	6	29.35	7	35.3	26	46.03	7	58.6	21	57.87	26	78.6
30.4	30.40	4	52.5	4	29.28	11	37.9	23	45.96	10	60.7	20	57.61	34	81.2
May 10.4	30.36	5	52.9	2	29.17	15	40.2	19	45.86	12	62.7	18	57.27	40	83.5
20.4	30.31	8	53.1	0	29.02	19	42.1	15	45.74	14	64.5	15	56.87	46	85.5
30.3	30.23	8	53.1	2	28.83	21	43.6	11	45.60	16	66.0	12	56.41	49	87.0
June 9.3	30.15	9	52.9	4	28.62	23	44.7	7	45.44	17	67.2	8	55.92	52	88.0
19.3	30.06	10	52.5	4	28.39	25	45.4	1	45.27	17	68.0	5	55.40	52	88.5
29.3	29.96	10	52.1	7	28.14	26	45.5	2	45.10	17	68.5	0	54.88	52	88.5
July 9.2	29.86	11	51.4	7	27.88	25	45.3	7	44.93	17	68.5	3	54.36	50	87.9
19.2	29.75	9	50.7	9	27.63	25	44.6	12	44.76	16	68.2	7	53.86	46	86.9
29.2	29.66	9	49.8	9	27.38	23	43.4	15	44.60	14	67.5	11	53.40	42	85.3
Aug. 8.1	29.57	8	48.9	9	27.15	20	41.9	19	44.46	12	66.4	15	52.98	37	83.2
18.1	29.49	5	48.0	9	26.95	16	40.0	22	44.34	10	64.9	18	52.61	30	80.8
28.1	29.44	3	47.1	8	26.79	11	37.8	23	44.24	7	63.1	21	52.31	23	77.9
Sept. 7.1	29.41	1	46.3	8	26.68	5	35.5	25	44.17	3	61.0	24	52.08	15	74.7
17.0	29.40	4	45.5	5	26.63	2	33.0	25	44.14	1	58.6	27	51.93	6	71.3
27.0	29.44	7	45.0	4	26.65	9	30.5	24	44.15	6	55.9	29	51.87	4	67.7
Oct. 7.0	29.51	12	44.6	1	26.74	16	28.1	22	44.21	10	53.0	31	51.91	14	63.9
17.0	29.63	16	44.5	2	26.90	25	25.9	19	44.31	16	49.9	31	52.05	24	60.1
26.9	29.79	21	44.7	6	27.15	32	24.0	15	44.47	21	46.8	32	52.29	35	56.3
Nov. 5.9	30.00	25	45.3	9	27.47	39	22.5	10	44.68	26	43.6	31	52.64	45	52.6
15.9	30.25	29	46.2	12	27.86	44	21.5	5	44.94	31	40.5	31	53.09	54	49.1
25.8	30.54	32	47.4	15	28.30	49	21.0	0	45.25	35	37.4	28	53.63	63	46.0
Dec. 5.8	30.86	34	48.9	18	28.79	52	21.0	6	45.60	38	34.6	26	54.26	69	43.2
15.8	31.20	35	50.7	20	29.31	54	21.6	12	45.98	40	32.0	22	54.95	73	40.9
25.8	31.55	35	52.7	22	29.85	53	22.8	17	46.38	41	29.8	17	55.68	76	39.2
35.7	31.90		54.9		30.38		24.5		46.79		28.1		56.44		38.0
Sec δ, Tan δ	1.040		−0.288		1.818		−1.519		1.342		+0.894		2.959		+2.785
Mean Place	$27^{\mathrm{s}}.862$		32″.34		$26^{\mathrm{s}}.420$		13″.90		$42^{\mathrm{s}}.626$		69″.01		$51^{\mathrm{s}}.770$		83″.08
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		−0.02		0.00		−0.10		0.00		+0.06		−0.01		+0.18
$D'_\psi \delta$, $D_\omega \delta$	−0.4		−0.1		−0.4		−0.1		−0.4		−0.1		−0.4		−0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**β Corvi.** Mag. 2.8				**24 Comæ *seq*.** Mag. 5.2				**α Muscæ.** Mag. 2.9				**χ Virginis.** Mag. 4.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	12 29		−22 55		12 30		+18 50		12 32		−68 39		12 34		− 7 31	
	s		″		s		″		s		″		s		″	
an. 0.7	55.52		34.4		52.76		28.7		5.47		48.5		51.96		44.1	
10.7	55.88	36	36.7	23	53.11	35	26.8	19	6.20	73	50.3	18	52.30	34	46.3	22
20.7	56.22	34	39.1	24	53.44	33	25.2	16	6.90	70	52.5	22	52.63	33	48.5	22
30.7	56.54	32	41.5	24	53.76	32	23.9	13	7.54	64	55.2	27	52.93	30	50.5	20
eb. 9.6	56.82	28	43.9	24	54.04	28	23.1	8	8.10	56	58.3	31	53.20	27	52.4	19
19.6	57.06	24	46.3	24	54.28	24	22.6	5	8.59	49	61.6	33	53.44	24	54.1	16
Mar. 1.6	57.27	21	48.5	22	54.48	20	22.6	0	8.99	40	65.2	36	53.64	20	55.6	15
11.6	57.43	16	50.6	21	54.64	16	22.9	3	9.30	31	68.8	36	53.79	15	56.8	12
21.5	57.54	11	52.4	18	54.75	11	23.5	6	9.51	21	72.5	37	53.91	12	57.8	10
31.5	57.62	8	54.1	17	54.83	8	24.3	8	9.63	12	76.1	36	54.00	9	58.6	8
Apr. 10.5	57.67	5	55.5	14	54.86	3	25.3	10	9.67	4	79.6	35	54.04	4	59.1	5
20.4	57.68	1	56.7	12	54.87	1	26.5	12	9.62	5	82.9	33	54.06	2	59.4	3
30.4	57.67	1	57.7	10	54.84	3	27.7	12	9.50	12	86.0	31	54.05	1	59.5	1
May 10.4	57.63	4	58.4	7	54.79	5	29.0	13	9.30	20	88.8	28	54.03	2	59.4	1
20.4	57.58	5	58.9	5	54.73	6	30.2	12	9.04	26	91.2	24	53.98	5	59.3	1
30.3	57.50	8	59.2	3	54.64	9	31.3	11	8.73	31	93.2	20	53.91	7	59.0	3
June 9.3	57.41	9	59.2	0	54.55	9	32.3	10	8.36	37	94.7	15	53.84	7	58.6	4
19.3	57.31	10	59.0	2	54.45	10	33.1	8	7.96	40	95.7	10	53.75	9	58.1	5
29.3	57.21	10	58.6	4	54.34	11	33.7	6	7.53	43	96.2	5	53.66	9	57.5	6
July 9.2	57.10	11	58.1	5	54.23	11	34.1	4	7.09	44	96.2	0	53.57	9	56.9	6
19.2	56.99	11	57.3	8	54.13	10	34.3	2	6.64	45	95.7	5	53.47	10	56.3	6
29.2	56.88	11	56.3	10	54.03	10	34.3	0	6.21	43	94.7	10	53.38	9	55.6	7
Aug. 8.1	56.78	10	55.3	10	53.94	9	34.1	2	5.81	40	93.2	15	53.29	9	55.0	6
18.1	56.70	8	54.1	12	53.86	8	33.6	5	5.46	35	91.3	19	53.21	8	54.4	6
28.1	56.63	7	53.0	11	53.80	6	32.8	8	5.17	29	89.1	22	53.15	6	53.9	5
Sept. 7.1	56.59	4	51.8	12	53.76	4	31.8	10	4.95	22	86.5	26	53.12	3	53.4	5
17.0	56.58	1	50.7	11	53.75	1	30.6	12	4.82	13	83.8	27	53.11	1	53.2	2
27.0	56.61	3	49.7	10	53.77	2	29.1	15	4.80	2	81.0	28	53.13	2	53.1	1
Oct. 7.0	56.68	7	49.0	7	53.83	6	27.4	17	4.90	10	78.2	28	53.20	7	53.3	2
17.0	56.80	12	48.5	5	53.94	11	25.4	20	5.10	20	75.6	26	53.30	10	53.7	4
26.9	56.97	17	48.3	2	54.08	14	23.2	22	5.43	33	73.2	24	53.45	15	54.4	7
Nov. 5.9	57.18	21	48.4	1	54.27	19	20.9	23	5.86	43	71.2	20	53.64	19	55.3	9
15.9	57.44	26	48.9	5	54.51	24	18.5	24	6.39	53	69.6	16	53.88	24	56.6	13
25.8	57.73	29	49.8	9	54.78	27	16.0	25	7.01	62	68.6	10	54.15	27	58.1	15
Dec. 5.8	58.06	33	51.1	13	55.09	31	13.5	25	7.70	69	68.2	4	54.45	30	59.9	18
15.8	58.41	35	52.7	16	55.42	33	11.0	25	8.43	73	68.3	1	54.78	33	61.9	20
25.8	58.77	36	54.5	18	55.77	35	8.7	23	9.18	75	69.1	8	55.12	34	64.0	21
35.7	59.13	36	56.7	22	56.12	35	6.6	21	9.93	75	70.5	14	55.47	35	66.2	22
ec δ, Tan δ	1.086		−0.423		1.057		+0.341		2.749		−2.561		1.009		−0.132	
ean Place	55ˢ.114		36″.53		52ˢ.010		41″.21		5ˢ.988		62″.42		51ˢ.448		40″.65	
$y_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		−0.03		0.00		+0.02		+0.01		−0.17		0.00		−0.01	
$\psi\delta$, $D_{\omega}\delta$	−0.4		−0.1		−0.4		−0.1		−0.4		−0.1		−0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*γ* **Centauri.** Mag. 2.4				*γ* **Virginis** (*mean*). Mag. 2.9				*ρ* **Virginis.** Mag. 5.0				**78 Ursæ Majoris.** Mag. 5.9		
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.
	h m 12 36		° ′ −48 29		h m 12 37		° ′ − 0 59		h m 12 37		° ′ +10 41		h m 12 37		° +63 1
	s		″		s		″		s		″		s		″
Jan. 0.7	49.42		25.9		21.76		5.9		35.61		63.7		52.81		22.8
10.7	49.87	45	27.9	20	22.09	33	8.1	22	35.95	34	61.6	21	53.41	60	21.8
20.7	50.31	44	30.3	24	22.42	33	10.1	20	36.28	33	59.8	18	53.99	58	21.4
30.7	50.71	40	33.0	27	22.72	30	12.0	19	36.59	31	58.3	15	54.54	55	21.6
Feb. 9.6	51.07	36	35.9	29	22.99	27	13.7	17	36.87	28	57.0	13	55.04	50	22.5
19.6	51.38	31	38.9	30	23.23	24	15.1	14	37.11	24	56.2	8	55.48	44	23.9
Mar. 1.6	51.64	26	42.0	31	23.43	20	16.2	11	37.31	20	55.7	5	55.83	35	25.8
11.6	51.85	21	45.2	32	23.59	16	17.1	9	37.47	16	55.5	2	56.10	27	28.1
21.5	52.00	15	48.3	31	23.71	12	17.7	6	37.59	12	55.6	1	56.27	17	30.7
31.5	52.10	10	51.2	29	23.79	8	18.0	3	37.67	8	56.0	4	56.36	9	33.5
Apr. 10.5	52.16	6	54.0	28	23.84	5	18.1	1	37.72	5	56.5	5	56.36	0	36.3
20.4	52.17	1	56.5	25	23.86	2	18.0	1	37.74	2	57.3	8	56.27	9	39.1
30.4	52.14	3	58.8	23	23.85	1	17.8	2	37.72	2	58.2	9	56.12	15	41.7
May 10.4	52.07	7	60.8	20	23.82	3	17.4	4	37.69	3	59.1	9	55.91	21	44.1
20.4	51.97	10	62.5	17	23.77	5	16.9	5	37.64	5	60.0	9	55.64	27	46.2
30.3	51.85	12	63.8	13	23.71	6	16.4	5	37.57	7	60.9	9	55.33	31	47.8
June 9.3	51.70	15	64.7	9	23.63	8	15.8	6	37.48	9	61.8	9	54.99	34	49.0
19.3	51.53	17	65.2	5	23.55	8	15.2	6	37.39	9	62.5	7	54.64	35	49.7
29.3	51.34	19	65.3	1	23.46	9	14.6	6	37.30	9	63.2	7	54.27	37	49.9
July 9.2	51.15	19	65.0	3	23.36	10	14.0	6	37.20	10	63.7	5	53.91	36	49.6
19.2	50.95	20	64.3	7	23.26	10	13.4	6	37.10	10	64.1	4	53.56	35	48.8
29.2	50.76	19	63.3	10	23.17	9	12.9	5	37.00	10	64.3	2	53.23	33	47.5
Aug. 8.1	50.58	18	61.8	15	23.08	9	12.5	4	36.91	9	64.4	1	52.93	30	45.8
18.1	50.42	16	60.1	17	23.00	8	12.2	3	36.84	7	64.2	2	52.66	27	43.6
28.1	50.29	13	58.2	19	22.94	6	11.9	3	36.77	7	63.9	3	52.43	23	41.0
Sept. 7.1	50.20	9	56.1	21	22.90	4	11.9	0	36.73	4	63.4	5	52.26	17	38.1
17.0	50.15	5	53.9	22	22.89	1	12.0	1	36.72	1	62.6	8	52.15	11	34.9
27.0	50.16	1	51.7	22	22.91	2	12.3	3	36.74	2	61.6	10	52.10	5	31.4
Oct. 7.0	50.23	7	49.7	20	22.97	6	12.8	5	36.80	6	60.3	13	52.13	3	27.8
17.0	50.36	13	47.8	19	23.07	10	13.6	8	36.89	9	58.8	15	52.23	10	24.1
26.9	50.56	20	46.2	16	23.21	14	14.7	11	37.03	14	57.1	17	52.41	18	20.4
Nov. 5.9	50.83	27	44.9	13	23.40	19	16.0	13	37.22	19	55.1	20	52.68	27	16.7
15.9	51.15	32	44.2	7	23.63	23	17.6	16	37.45	23	53.0	21	53.03	35	13.2
25.8	51.53	38	43.9	3	23.90	27	19.4	18	37.71	26	50.8	22	53.45	42	10.0
Dec. 5.8	51.95	42	44.1	2	24.20	30	21.4	20	38.01	30	48.4	24	53.93	48	7.1
15.8	52.39	44	44.8	7	24.52	32	23.5	21	38.33	32	46.1	23	54.47	54	4.6
25.8	52.85	46	46.1	13	24.86	34	25.7	22	38.67	34	43.8	23	55.04	57	2.6
35.7	53.32	47	47.8	17	25.19	33	27.9	22	39.02	35	41.6	22	55.64	60	1.2
Sec δ, Tan δ	1.509		−1.131		1.000		−0.017		1.018		+0.189		2.216		+1.977
Mean Place	49s.362		35″.47		21s.210		0″.07		34s.974		73″.65		51s.390		46″.47
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		−0.07		0.00		0.00		0.00		+0.01		−0.01		+0.13
$D'_\psi \delta$, $D_\omega \delta$	−0.4		−0.2		−0.4		−0.2		−0.4		−0.2		−0.4		−0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

n Solar ate.	**β Crucis.** Mag. 1.5				**31 Comæ.** Mag. 5.1				**32 H. Camelop.** *seq.* Mag. 5.3				**η Centauri.** Mag. 4.3			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	12 42		−59 13		12 47		+27 59		12 48		+83 51		12 48		−39 42	
	s		″		s		″		s		″		s		″	
i. 0.8	44.44	56	15.8	18	34.27	37	54.9	19	33.41	214	64.1	7	43.55	41	53.7	20
10.7	45.00	53	17.6	22	34.64	35	53.0	14	35.55	212	63.4	1	43.96	40	55.7	23
20.7	45.53	50	19.8	26	34.99	34	51.6	10	37.67	203	63.5	6	44.36	37	58.0	25
30.7	46.03	45	22.4	30	35.33	30	50.6	6	39.70	186	64.1	13	44.73	33	60.5	27
). 9.6	46.48	39	25.4	31	35.63	27	50.0	1	41.56	162	65.4	19	45.06	29	63.2	27
19.6	46.87	33	28.5	34	35.90	23	49.9	4	43.18	133	67.3	23	45.35	26	65.9	28
r. 1.6	47.20	26	31.9	34	36.13	18	50.3	7	44.51	98	69.6	27	45.61	20	68.7	28
11.6	47.46	19	35.3	34	36.31	13	51.0	11	45.49	62	72.3	29	45.81	15	71.5	27
21.5	47.65	13	38.7	33	36.44	9	52.1	14	46.11	23	75.2	31	45.96	12	74.2	25
31.5	47.78	6	42.0	32	36.53	5	53.5	15	46.34	15	78.3	31	46.08	7	76.7	24
r. 10.5	47.84	1	45.2	30	36.58	2	55.0	17	46.19	52	81.4	30	46.15	3	79.1	21
20.5	47.85	4	48.2	28	36.60	2	56.7	17	45.67	86	84.4	27	46.18	0	81.2	19
30.4	47.81	10	51.0	25	36.58	5	58.4	16	44.81	116	87.1	24	46.18	3	83.1	16
y 10.4	47.71	14	53.5	21	36.53	7	60.0	16	43.65	142	89.5	21	46.15	6	84.7	14
20.4	47.57	18	55.6	18	36.46	9	61.6	14	42.23	162	91.6	15	46.09	9	86.1	10
30.3	47.39	22	57.4	13	36.37	11	63.0	12	40.61	177	93.1	11	46.00	10	87.1	7
ne 9.3	47.17	24	58.7	9	36.26	11	64.2	10	38.84	188	94.2	5	45.90	13	87.8	3
19.3	46.93	27	59.6	4	36.15	12	65.2	7	36.96	193	94.7	1	45.77	14	88.1	1
29.3	46.66	28	60.0	0	36.03	13	65.9	4	35.03	192	94.6	6	45.63	15	88.2	4
ly 9.2	46.38	29	60.0	6	35.90	13	66.3	1	33.11	188	94.0	12	45.48	15	87.8	6
19.2	46.09	28	59.4	9	35.77	13	66.4	2	31.23	179	92.8	17	45.33	16	87.2	10
29.2	45.81	26	58.5	14	35.64	12	66.2	5	29.44	165	91.1	21	45.17	15	86.2	12
ug. 8.2	45.55	24	57.1	18	35.52	10	65.7	8	27.79	149	89.0	26	45.02	13	85.0	14
18.1	45.31	20	55.3	21	35.42	9	64.9	11	26.30	129	86.4	30	44.89	11	83.6	17
28.1	45.11	15	53.2	23	35.33	6	63.8	14	25.01	106	83.4	34	44.78	8	81.9	18
pt. 7.1	44.96	9	50.9	25	35.27	3	62.4	17	23.95	80	80.0	35	44.70	4	80.1	18
17.0	44.87	1	48.4	25	35.24	0	60.7	20	23.15	52	76.5	38	44.66	0	78.3	18
27.0	44.86	6	45.9	25	35.24	4	58.7	22	22.63	23	72.7	39	44.66	5	76.5	16
ct. 7.0	44.92	15	43.4	23	35.28	8	56.5	24	22.40	9	68.8	39	44.71	11	74.9	15
17.0	45.07	23	41.1	21	35.36	13	54.1	26	22.49	41	64.9	38	44.82	17	73.4	12
26.9	45.30	31	39.0	18	35.49	18	51.5	28	22.90	73	61.1	38	44.99	22	72.2	9
ov. 5.9	45.61	39	37.2	13	35.67	22	48.7	28	23.63	104	57.3	35	45.21	28	71.3	4
15.9	46.00	46	35.9	8	35.89	27	45.9	28	24.67	133	53.8	31	45.49	33	70.9	1
25.9	46.46	51	35.1	2	36.16	31	43.1	28	26.00	160	50.7	28	45.82	36	70.8	5
ec. 5.8	46.97	55	34.9	3	36.47	33	40.3	26	27.60	182	47.9	22	46.18	40	71.3	9
15.8	47.52	56	35.2	9	36.80	35	37.7	24	29.42	199	45.7	17	46.58	41	72.2	14
25.8	48.08	57	36.1	14	37.15	37	35.3	21	31.41	209	44.0	11	46.99	42	73.6	17
35.7	48.65		37.5		37.52		33.2		33.50		42.9		47.41		75.3	
δ, Tan δ	1.955		−1.679		1.133		+0.532		9.364		+9.310		1.300		−0.831	
an Place	44ˢ.680		27″.68		33ˢ.559		70″.80		29ˢ.536		89″.63		43ˢ.435		60″.51	
α, D α	+0.01		−0.11		0.00		+0.03		−0.05		+0.61		0.00		−0.05	
δ, D δ	−0.4		−0.2		−0.4		−0.2		−0.4		−0.2		−0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ε Ursæ Majoris.** (*Alioth.*) Mag. 1.7				**δ Virginis.** Mag. 3.7				**α Can. Ven.** *seq.* Mag. 2.9				**δ Muscæ.** Mag. 3.6		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declin tion S
	h m 12 50		° ′ +56 24		h m 12 51		° ′ + 3 51		h m 12 52		° ′ +38 45		h m 12 56		° −71
	s		″		s		″		s		″		s		″
Jan. 0.8	18.69		52.7		19.77		25.1		4.02		78.9		23.09		12.8
10.7	19.20	51	51.4	13	20.11	34	22.9	22	4.41	39	77.2	17	23.93	84	14.1
20.7	19.70	50	50.6	8	20.44	33	20.9	20	4.80	39	76.0	12	24.73	80	15.9
30.7	20.18	48	50.5	1	20.75	31	19.2	17	5.16	36	75.3	7	25.48	75	18.3
Feb. 9.6	20.61	43	51.0	5	21.03	28	17.7	15	5.50	34	75.1	2	26.17	69	21.1
19.6	20.99	38	52.1	11	21.27	24	16.5	12	5.80	30	75.5	4	26.77	60	24.2
Mar. 1.6	21.31	32	53.7	16	21.48	21	15.6	9	6.05	25	76.3	8	27.29	52	27.6
11.6	21.56	25	55.7	20	21.66	18	15.0	6	6.25	20	77.6	13	27.71	42	31.1
21.5	21.74	18	58.0	23	21.79	13	14.7	3	6.39	14	79.2	16	28.03	32	34.7
31.5	21.84	10	60.6	26	21.89	10	14.7	0	6.49	10	81.1	19	28.24	21	38.4
Apr. 10.5	21.88	4	63.3	27	21.95	6	14.9	2	6.54	5	83.1	20	28.36	12	42.0
20.5	21.85	3	66.0	27	21.98	3	15.2	3	6.55	1	85.3	22	28.38	2	45.4
30.4	21.76	9	68.6	26	21.98	0	15.8	6	6.52	3	87.4	21	28.32	6	48.6
May 10.4	21.62	14	71.0	24	21.96	2	16.4	6	6.45	7	89.4	20	28.16	16	51.6
20.4	21.43	19	73.1	21	21.92	4	17.1	7	6.35	10	91.3	19	27.92	24	54.3
30.3	21.21	22	74.9	18	21.86	6	17.8	7	6.24	11	93.0	17	27.61	31	56.5
June 9.3	20.97	24	76.3	14	21.79	7	18.6	8	6.10	14	94.3	13	27.24	37	58.3
19.3	20.70	27	77.2	9	21.71	8	19.3	7	5.95	15	95.4	11	26.82	42	59.7
29.3	20.43	27	77.7	5	21.62	9	19.9	6	5.79	16	96.1	7	26.35	47	60.6
July 9.2	20.15	28	77.7	0	21.52	10	20.5	6	5.63	16	96.4	3	25.85	50	60.9
19.2	19.88	27	77.2	5	21.42	10	21.0	5	5.46	17	96.3	1	25.34	51	60.8
29.2	19.62	26	76.2	10	21.32	10	21.4	4	5.31	15	95.8	5	24.83	51	60.1
Aug. 8.2	19.37	25	74.8	14	21.22	10	21.7	3	5.16	15	95.0	8	24.35	48	58.9
18.1	19.15	22	73.0	18	21.14	8	21.9	2	5.02	14	93.8	12	23.90	45	57.2
28.1	18.96	19	70.7	23	21.07	7	21.9	0	4.91	11	92.3	15	23.52	38	55.2
Sept. 7.1	18.81	15	68.1	26	21.02	5	21.7	2	4.82	9	90.4	19	23.22	30	52.8
17.0	18.71	10	65.2	29	20.99	3	21.3	4	4.77	5	88.2	22	23.01	21	50.1
27.0	18.66	5	62.0	32	21.00	1	20.7	6	4.75	2	85.7	25	22.92	9	47.3
Oct. 7.0	18.67	1	58.6	34	21.04	4	19.9	8	4.78	3	83.0	27	22.95	3	44.5
17.0	18.74	7	55.0	36	21.13	9	18.8	11	4.85	7	80.0	30	23.11	16	41.8
26.9	18.89	15	51.4	36	21.25	12	17.5	13	4.98	13	76.9	31	23.40	29	39.2
Nov. 5.9	19.10	21	47.8	36	21.42	17	15.9	16	5.16	18	73.8	31	23.82	42	36.9
15.9	19.38	28	44.3	35	21.64	22	14.1	18	5.39	23	70.6	32	24.36	54	35.0
25.9	19.72	34	40.9	34	21.90	26	12.1	20	5.67	28	67.5	31	25.01	65	33.6
Dec. 5.8	20.13	41	37.9	30	22.18	28	10.0	21	5.99	32	64.6	29	25.74	73	32.8
15.8	20.58	45	35.2	27	22.50	32	7.8	22	6.35	36	61.8	28	26.53	79	32.5
25.8	21.06	48	33.0	22	22.83	33	5.5	23	6.73	38	59.4	24	27.36	83	32.9
35.7	21.57	51	31.3	17	23.17	34	3.3	22	7.12	39	57.4	20	28.20	84	33.9
Sec δ, Tan δ	1.808		+1.506		1.002		+0.067		1.283		+0.803		3.086		−2.919
Mean Place	17ˢ.640		75″.62		19ˢ.267		33″.00		3ˢ.235		97″.95		24ˢ.108		26″.22
$D'_{\psi}a$, $D_{\omega}a$	−0.01		+0.10		0.00		0.00		0.00		+0.05		+0.02		−0.19
$D'_{\psi}\delta$, $D_{\omega}\delta$	−0.4		−0.2		−0.4		−0.2		−0.4		−0.2		−0.4		−0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**ε Virginis.** Mag. 3.0				**θ Virginis.** Mag. 4.4				**43 Comæ.** Mag. 4.3				**20 Canum Venat.** Mag. 4.7			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	12 57		+11 24		13 5		− 5 5		13 7		+28 17		13 13		+41 0	
	s		″		s		″		s		″		s		″	
an. 0.8	57.25		46.0		33.18		12.9		55.08		75.2		44.66		51.6	
10.7	57.60	35	43.9	21	33.52	34	15.0	21	55.44	36	73.2	20	45.06	40	49.7	19
20.7	57.93	33	42.0	19	33.86	34	17.1	21	55.80	36	71.6	16	45.46	40	48.3	14
30.7	58.25	32	40.5	15	34.17	31	19.1	20	56.14	34	70.5	11	45.84	38	47.5	8
eb. 9.7	58.54	29	39.3	12	34.46	29	20.9	18	56.45	31	69.9	6	46.20	36	47.2	3
19.6	58.79	25	38.4	9	34.72	26	22.4	15	56.73	28	69.7	2	46.52	32	47.5	3
ar. 1.6	59.01	22	37.9	5	34.95	23	23.7	13	56.97	24	70.0	3	46.80	28	48.3	8
11.6	59.19	18	37.7	2	35.13	18	24.8	11	57.17	20	70.8	8	47.02	22	49.6	13
21.5	59.33	14	37.8	1	35.28	15	25.6	8	57.33	16	71.9	11	47.20	18	51.3	17
31.5	59.43	10	38.2	4	35.39	11	26.2	6	57.44	11	73.2	13	47.32	12	53.2	19
pr. 10.5	59.50	7	38.9	7	35.47	8	26.5	3	57.51	7	74.8	16	47.40	8	55.4	22
20.5	59.53	3	39.7	8	35.52	5	26.7	2	57.54	3	76.6	18	47.43	3	57.7	23
30.4	59.54	1	40.7	10	35.55	3	26.6	1	57.54	0	78.4	18	47.42	1	60.0	23
ay 10.4	59.52	2	41.7	10	35.54	1	26.4	2	57.51	3	80.2	18	47.37	5	62.2	22
20.4	59.48	4	42.7	10	35.52	2	26.1	3	57.45	6	81.9	17	47.28	9	64.3	21
30.4	59.42	6	43.7	10	35.47	5	25.7	4	57.37	8	83.5	16	47.17	11	66.2	19
June 9.3	59.34	8	44.7	10	35.41	6	25.2	5	57.28	9	84.9	14	47.04	13	67.8	16
19.3	59.26	8	45.5	8	35.34	7	24.7	5	57.16	12	86.0	11	46.88	16	69.0	12
29.3	59.16	10	46.3	8	35.25	9	24.1	6	57.04	12	86.9	9	46.72	16	69.9	9
July 9.2	59.06	10	46.9	6	35.15	10	23.5	6	56.91	13	87.5	6	46.54	18	70.4	5
19.2	58.95	11	47.3	4	35.05	10	22.9	6	56.77	14	87.7	2	46.36	18	70.5	1
29.2	58.85	10	47.6	3	34.95	10	22.4	5	56.64	13	87.7	0	46.18	18	70.1	4
Aug. 8.2	58.75	10	47.7	1	34.85	10	21.8	6	56.51	13	87.3	4	46.01	17	69.4	7
18.1	58.65	10	47.5	2	34.76	9	21.4	4	56.38	13	86.6	7	45.85	16	68.3	11
28.1	58.57	8	47.2	3	34.68	8	21.0	4	56.28	10	85.6	10	45.71	14	66.8	15
Sept. 7.1	58.51	6	46.7	5	34.62	6	20.7	3	56.19	9	84.3	13	45.59	12	64.9	19
17.1	58.48	3	45.9	8	34.58	4	20.6	1	56.13	6	82.7	16	45.50	9	62.7	22
27.0	58.48	0	44.9	10	34.57	1	20.7	1	56.11	2	80.8	19	45.46	4	60.2	25
Oct. 7.0	58.51	3	43.6	13	34.61	4	20.9	2	56.12	1	78.6	22	45.45	1	57.4	28
17.0	58.59	8	42.1	15	34.68	7	21.4	5	56.18	6	76.2	24	45.49	4	54.4	30
26.9	58.71	12	40.3	18	34.80	12	22.2	8	56.28	10	73.6	26	45.59	10	51.2	32
Nov. 5.9	58.87	16	38.3	20	34.96	16	23.3	11	56.43	15	70.9	27	45.74	15	48.0	32
15.9	59.08	21	36.2	21	35.17	21	24.6	13	56.63	20	68.0	29	45.95	21	44.7	33
25.9	59.33	25	33.9	23	35.42	25	26.1	15	56.88	25	65.2	28	46.21	26	41.4	33
Dec. 5.8	59.62	29	31.5	24	35.71	29	27.9	18	57.17	29	62.3	29	46.52	31	38.3	31
15.8	59.93	31	29.1	24	36.02	31	29.9	20	57.49	32	59.7	26	46.86	34	35.5	28
25.8	60.26	33	26.8	23	36.35	33	32.0	21	57.84	35	57.2	25	47.24	38	32.9	26
35.8	60.60	34	24.6	22	36.69	34	34.1	21	58.20	36	55.0	22	47.63	39	30.8	21
ec δ, Tan δ	1.020		+0.202		1.004		−0.089		1.136		+0.538		1.325		+0.870	
ean Place	56ˢ.741		56″.75		32ˢ.829		7″.72		54ˢ.514		91″.63		44ˢ.057		71″.61	
$D_\psi a$, $D_\omega a$	0.00		+0.01		0.00		−0.01		0.00		+0.03		−0.01		+0.06	
$D_\psi \delta$, $D_\omega \delta$	−0.4		−0.2		−0.4		−0.3		−0.4		−0.3		−0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**γ Hydræ.** Mag. 3.3				**ι Centauri.** Mag. 2.9				**ζ¹ Ursæ Majoris.** (*Mizar.*) Mag. 2.4				**α Virginis.** (*Spica.*) Mag. 1.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 13 14		° ′ −22 43		h m 13 15		° ′ −36 15		h m 13 20		° ′ +55 21		h m 13 20		° ′ −10 43	
	s		″		s		″		s		″		s		″	
Jan. 0.8	17.98	37	23.4	20	48.73	40	46.3	18	31.05	49	45.2	18	43.00	35	8.1	21
10.7	18.35	36	25.4	21	49.13	40	48.1	21	31.54	49	43.4	11	43.35	34	10.2	21
20.7	18.71	33	27.5	22	49.53	37	50.2	23	32.03	48	42.3	5	43.69	32	12.3	20
30.7	19.04	31	29.7	22	49.90	35	52.5	24	32.51	44	41.8	2	44.01	30	14.3	19
Feb. 9.7	19.35	28	31.9	22	50.25	31	54.9	25	32.95	40	42.0	7	44.31	27	16.2	17
19.6	19.63	25	34.1	21	50.56	27	57.4	25	33.35	35	42.7	13	44.58	24	17.9	16
Mar. 1.6	19.88	21	36.2	19	50.83	22	59.9	25	33.70	29	44.0	18	44.82	20	19.5	13
11.6	20.09	16	38.1	17	51.05	19	62.4	25	33.99	22	45.8	22	45.02	17	20.8	11
21.6	20.25	13	39.8	16	51.24	15	64.9	23	34.21	15	48.0	25	45.19	13	21.9	9
31.5	20.38	10	41.4	14	51.39	10	67.2	21	34.36	9	50.5	27	45.32	10	22.8	6
Apr. 10.5	20.48	7	42.8	12	51.49	7	69.3	19	34.45	2	53.2	28	45.42	7	23.4	5
20.5	20.55	3	44.0	9	51.56	4	71.2	18	34.47	4	56.0	27	45.49	3	23.9	3
30.4	20.58	1	44.9	8	51.60	0	73.0	15	34.43	10	58.7	26	45.52	1	24.2	1
May 10.4	20.59	2	45.7	6	51.60	3	74.5	12	34.33	14	61.3	24	45.53	1	24.3	1
20.4	20.57	4	46.3	4	51.57	5	75.7	10	34.19	18	63.7	20	45.52	3	24.2	2
30.4	20.53	6	46.7	1	51.52	8	76.7	8	34.01	22	65.7	17	45.49	5	24.0	2
June 9.3	20.47	8	46.8	0	51.44	10	77.5	4	33.79	24	67.4	13	45.44	7	23.8	4
19.3	20.39	9	46.8	2	51.34	12	77.9	1	33.55	26	68.7	9	45.37	8	23.4	5
29.3	20.30	11	46.6	4	51.22	13	78.0	2	33.29	28	69.6	4	45.29	10	22.9	5
July 9.3	20.19	11	46.2	6	51.09	15	77.8	4	33.01	27	70.0	1	45.19	10	22.4	6
19.2	20.08	12	45.6	7	50.94	15	77.4	7	32.74	28	69.9	6	45.09	11	21.8	6
29.2	19.96	12	44.9	8	50.79	15	76.7	10	32.46	27	69.3	11	44.98	11	21.2	6
Aug. 8.2	19.84	11	44.1	10	50.64	14	75.7	12	32.19	25	68.2	15	44.87	10	20.6	6
18.1	19.73	10	43.1	10	50.50	12	74.5	14	31.94	22	66.7	20	44.77	9	20.0	6
28.1	19.63	8	42.1	10	50.38	10	73.1	15	31.72	19	64.7	23	44.68	8	19.4	5
Sept. 7.1	19.55	5	41.1	10	50.28	7	71.6	16	31.53	15	62.4	27	44.60	5	18.9	4
17.1	19.50	1	40.1	9	50.21	2	70.0	16	31.38	10	59.7	31	44.55	2	18.5	3
27.0	19.49	2	39.2	8	50.19	2	68.4	15	31.28	5	56.6	33	44.53	2	18.2	1
Oct. 7.0	19.51	7	38.4	6	50.21	7	66.9	13	31.23	2	53.3	35	44.55	6	18.1	2
17.0	19.58	12	37.8	3	50.28	13	65.6	11	31.25	8	49.8	36	44.61	11	18.3	4
27.0	19.70	17	37.5	0	50.41	19	64.5	8	31.33	15	46.2	36	44.72	15	18.7	7
Nov. 5.9	19.87	22	37.5	3	50.60	24	63.7	5	31.48	23	42.6	37	44.87	20	19.4	9
15.9	20.09	27	37.8	6	50.84	29	63.2	0	31.71	29	38.9	35	45.07	25	20.3	13
25.9	20.36	30	38.4	10	51.13	34	63.2	3	32.00	35	35.4	32	45.32	28	21.6	15
Dec. 5.8	20.66	33	39.4	14	51.47	37	63.5	8	32.35	41	32.2	30	45.60	31	23.1	17
15.8	20.99	36	40.8	16	51.84	39	64.3	12	32.76	45	29.2	25	45.91	33	24.8	19
25.8	21.35	36	42.4	18	52.23	40	65.5	16	33.21	48	26.7	21	46.24	34	26.7	20
35.8	21.71		44.2		52.63		67.1		33.69		24.6		46.58		28.7	
Sec δ, Tan δ	1.084		−0.419		1.240		−0.734		1.759		+1.448		1.018		−0.189	
Mean Place	17ˢ.827		24″.10		48ˢ.741		51″.30		30ˢ.405		68″.38		42ˢ.776		4″.50	
D′ψ α, Dω α	0.00		−0.03		+0.01		−0.05		−0.01		+0.09		0.00		−0.01	
Dψ δ, Dω δ	−0.4		−0.3		−0.4		−0.3		−0.4		−0.3		−0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	Groombridge 2001. Mag. 6.1				70 Virginis. Mag. 5.2				κ Octantis. Mag. 5.6				ζ Virginis. Mag. 3.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 13 23		° ′ +72 49		h m 13 24		° ′ +14 13		h m 13 26		° ′ −85 20		h m 13 30		° ′ − 0 9	
	s		″		s		″		s		″		s		″	
an. 0.8	58.68		31.8		16.72		44.5		48.86		51.3		21.87		49.4	
10.8	59.50	82	30.4	14	17.06	34	42.3	22	51.91	305	51.8	5	22.21	34	51.5	21
20.7	60.33	83	29.7	7	17.40	34	40.4	19	54.92	301	53.0	12	22.54	33	53.5	20
30.7	61.15	82	29.6	1	17.73	33	38.8	16	57.81	289	54.7	17	22.86	32	55.3	18
eb. 9.7	61.93	78	30.2	6	18.03	30	37.6	12	60.52	271	56.9	22	23.16	30	56.9	16
19.6	62.63	70	31.4	12	18.31	28	36.8	8	62.99	247	59.6	27	23.44	28	58.3	14
ar. 1.6	63.24	61	33.2	18	18.55	24	36.3	5	65.16	217	62.6	30	23.68	24	59.4	11
11.6	63.73	49	35.5	23	18.75	20	36.2	1	67.00	184	66.0	34	23.88	20	60.2	8
21.6	64.10	37	38.1	26	18.92	17	36.5	3	68.47	147	69.6	36	24.05	17	60.7	5
31.5	64.33	23	41.0	29	19.04	12	37.1	6	69.56	109	73.3	37	24.19	14	60.9	2
pr. 10.5	64.43	10	44.0	30	19.14	10	37.9	8	70.26	70	77.1	38	24.29	10	60.9	0
20.5	64.40	3	47.1	31	19.20	6	38.9	10	70.56	30	80.8	37	24.37	8	60.7	2
30.5	64.24	16	50.1	30	19.22	2	40.1	12	70.45	11	84.4	36	24.41	4	60.4	3
ay 10.4	63.97	27	52.8	27	19.22	0	41.3	12	69.95	50	87.9	35	24.42	1	59.9	5
20.4	63.60	37	55.3	25	19.20	2	42.5	12	69.08	87	91.2	33	24.42	0	59.3	6
30.4	63.14	46	57.4	21	19.16	4	43.7	12	67.86	122	94.1	29	24.39	3	58.6	7
une 9.3	62.61	53	59.0	16	19.09	7	44.8	11	66.31	155	96.6	25	24.34	5	58.0	6
19.3	62.03	58	60.2	12	19.01	8	45.8	10	64.49	182	98.7	21	24.27	7	57.3	7
29.3	61.41	62	60.8	6	18.92	9	46.6	8	62.43	206	100.3	16	24.19	8	56.6	7
uly 9.3	60.77	64	61.0	2	18.81	11	47.3	7	60.21	222	101.4	11	24.10	9	56.0	6
19.2	60.13	64	60.5	5	18.70	11	47.8	5	57.88	233	101.9	5	24.00	10	55.4	6
29.2	59.50	63	59.6	9	18.59	11	48.1	3	55.52	236	101.8	1	23.89	11	54.9	5
Aug. 8.2	58.89	61	58.1	15	18.47	12	48.2	1	53.21	231	101.1	7	23.78	11	54.4	5
18.2	58.32	57	56.2	19	18.36	11	48.0	2	51.03	218	99.9	12	23.67	11	54.1	3
28.1	57.80	52	53.8	24	18.26	10	47.6	4	49.06	197	98.2	17	23.58	9	53.9	2
Sept. 7.1	57.35	45	51.0	28	18.18	8	47.0	6	47.38	168	96.1	21	23.50	8	53.9	0
17.1	56.98	37	47.8	32	18.12	6	46.1	9	46.07	131	93.5	26	23.44	6	54.0	1
27.0	56.71	27	44.4	34	18.09	3	44.9	12	45.17	90	90.7	28	23.41	3	54.3	3
Oct. 7.0	56.54	17	40.7	37	18.09	0	43.5	14	44.76	41	87.7	30	23.41	0	54.9	6
17.0	56.48	6	36.9	38	18.14	5	41.9	16	44.86	10	84.6	31	23.46	5	55.7	8
27.0	56.55	7	33.0	39	18.23	9	40.0	19	45.47	61	81.6	30	23.55	9	56.7	10
Nov. 5.9	56.74	19	29.1	39	18.37	14	37.9	21	46.60	113	78.8	28	23.69	14	58.0	13
15.9	57.06	32	25.3	38	18.55	18	35.6	23	48.22	162	76.2	26	23.87	18	59.5	15
25.9	57.50	44	21.8	35	18.78	23	33.1	25	50.27	205	74.1	21	24.10	23	61.3	18
Dec. 5.9	58.06	56	18.5	33	19.05	27	30.6	25	52.69	242	72.4	17	24.36	26	63.2	19
15.8	58.71	65	15.7	28	19.35	30	28.1	25	55.41	272	71.3	11	24.66	30	65.2	20
25.8	59.45	74	13.3	24	19.67	32	25.7	24	58.33	292	70.9	4	24.98	32	67.3	21
35.8	60.25	80	11.6	17	20.01	34	23.4	23	61.37	304	71.0	1	25.32	34	69.5	22
ec δ, Tan δ	3.387		+3.236		1.032		+0.254		12.347		−12.306		1.000		−0.003	
ean Place	57$^{\mathrm{s}}$.867		57″.36		16$^{\mathrm{s}}$.359		56″.80		56$^{\mathrm{s}}$.42*		64″.95		21$^{\mathrm{s}}$.625		41″.83	
$D'_{\phi}\alpha$, $D_{\infty}\alpha$	−0.03		+0.20		0.00		+0.02		+0.12		−0.76		0.00		0.00	
$D_{\phi}\delta$, $D_{\infty}\delta$	−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**17 H. Canum Venat.** Mag. 5.0				**ε Centauri.** Mag. 2.6				***m* Virginis.** Mag. 5.2				**τ Boötis.** Mag. 4.5		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	13 31		+37 36		13 34		−53 1		13 37		− 8 16		13 43		+17
	s		″		s		″		s		″		s		″
Jan. 0.8	0.64		44.1		29.10		56.4		9.06		33.0		13.63		34.0
10.8	1.03	39	42.0	21	29.61	51	57.6	12	9.40	34	35.0	20	13.97	34	31.8
20.7	1.41	38	40.4	16	30.11	50	59.3	17	9.74	34	37.0	20	14.31	34	29.9
30.7	1.78	37	39.4	10	30.59	48	61.3	20	10.07	33	39.0	20	14.64	33	28.3
Feb. 9.7	2.13	35	38.9	5	31.04	45	63.7	24	10.38	31	40.8	18	14.95	31	27.2
19.7	2.46	33	38.9	0	31.45	41	66.3	26	10.66	28	42.4	16	15.24	29	26.4
Mar. 1.6	2.74	28	39.5	6	31.82	37	69.1	28	10.91	25	43.8	14	15.50	26	26.1
11.6	2.97	23	40.5	10	32.14	32	72.0	29	11.13	22	45.0	12	15.72	22	26.2
21.6	3.17	20	41.9	14	32.40	26	75.0	30	11.31	18	45.9	9	15.90	18	26.6
31.5	3.31	14	43.7	18	32.61	21	77.9	29	11.45	14	46.6	7	16.05	15	27.4
Apr. 10.5	3.41	10	45.8	21	32.77	16	80.8	29	11.56	11	47.1	5	16.16	11	28.5
20.5	3.46	5	48.0	22	32.88	11	83.6	28	11.65	9	47.4	3	16.24	8	29.8
30.5	3.47	1	50.2	22	32.94	6	86.2	26	11.70	5	47.5	1	16.28	4	31.2
May 10.4	3.45	2	52.4	22	32.96	2	88.5	23	11.73	3	47.4	1	16.29	1	32.6
20.4	3.39	6	54.5	21	32.92	4	90.7	22	11.73	0	47.2	2	16.28	1	34.1
30.4	3.30	9	56.4	19	32.85	7	92.5	18	11.71	2	46.9	3	16.25	3	35.5
June 9.4	3.19	11	58.1	17	32.74	11	94.0	15	11.66	5	46.6	3	16.19	6	36.8
19.3	3.06	13	59.5	14	32.59	15	95.1	11	11.60	6	46.1	5	16.11	8	38.0
29.3	2.91	15	60.6	11	32.41	18	95.9	8	11.53	7	45.6	5	16.02	9	39.0
July 9.3	2.75	16	61.3	7	32.21	20	96.2	3	11.44	9	45.1	5	15.91	11	39.8
19.2	2.59	16	61.6	3	31.99	22	96.2	0	11.33	11	44.5	6	15.79	12	40.4
29.2	2.42	17	61.5	1	31.76	23	95.7	5	11.22	11	43.9	6	15.67	12	40.7
Aug. 8.2	2.25	17	61.0	5	31.53	23	94.8	9	11.11	11	43.4	5	15.54	13	40.8
18.2	2.09	16	60.1	9	31.30	23	93.6	12	11.00	11	42.8	6	15.41	13	40.6
28.1	1.94	15	58.9	12	31.09	21	92.0	16	10.90	10	42.4	4	15.30	11	40.2
Sept. 7.1	1.81	13	57.3	16	30.92	17	90.2	18	10.81	9	42.0	4	15.19	11	39.4
17.1	1.71	10	55.3	20	30.79	13	88.1	21	10.75	6	41.7	3	15.11	8	38.4
27.1	1.65	6	53.0	23	30.71	8	85.9	22	10.72	3	41.6	1	15.06	5	37.2
Oct. 7.0	1.62	3	50.4	26	30.69	2	83.7	22	10.72	0	41.6	0	15.04	2	35.6
17.0	1.65	3	47.6	28	30.74	5	81.6	21	10.76	4	41.9	3	15.06	2	33.8
27.0	1.72	7	44.6	30	30.87	13	79.6	20	10.85	9	42.4	5	15.13	7	31.8
Nov. 5.9	1.85	13	41.4	32	31.08	21	77.8	18	10.98	13	43.2	8	15.25	12	29.5
15.9	2.03	18	38.2	32	31.36	28	76.4	14	11.17	19	44.3	11	15.41	16	27.1
25.9	2.27	24	35.0	32	31.70	34	75.4	10	11.40	23	45.6	13	15.62	21	24.5
Dec. 5.9	2.55	28	31.8	32	32.11	41	74.8	6	11.66	26	47.1	15	15.88	26	21.9
15.8	2.88	33	28.9	29	32.56	45	74.7	1	11.96	30	48.9	18	16.17	29	19.3
25.8	3.23	35	26.2	27	33.05	49	75.1	4	12.29	33	50.8	19	16.48	31	16.8
35.8	3.60	37	23.9	23	33.56	51	76.0	9	12.63	34	52.8	20	16.82	34	14.4
Sec δ, Tan δ	1.262		+0.770		1.663		−1.329		1.011		−0.145		1.051		+0.322
Mean Place	$0^{s}.209$		63″.52		$29^{s}.567$		65″.10		$8^{s}.910$		28″.09		$13^{s}.369$		47″.83
D′ψ α, Dω α	−0.01		+0.05		+0.01		−0.08		0.00		−0.01		0.00		+0.02
Dψ δ, Dω δ	−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4		−0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	*η* Ursæ Majoris. (*Alkaid.*) Mag. 1.9				89 Virginis. Mag. 5.1				ζ Centauri. Mag. 3.1				*η* Boötis. Mag. 2.8			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 13 44		° ′ +49 43		h m 13 45		° ′ −17 42		h m 13 50		° ′ −46 52		h m 13 50		° ′ +18 48	
	s		″		s		″		s		″		s		″	
n. 0.8	11.95		51.3		15.01		42.0		13.36		7.2		38.47		70.0	
10.8	12.38	43	49.3	20	15.37	36	43.9	19	13.82	46	8.4	12	38.81	34	67.7	23
20.7	12.82	44	47.8	15	15.72	35	45.8	19	14.28	46	9.9	15	39.15	34	65.8	19
30.7	13.26	44	46.9	9	16.06	34	47.8	20	14.72	44	11.8	19	39.49	34	64.2	16
b. 9.7	13.67	41	46.6	3	16.38	32	49.8	20	15.14	42	14.0	22	39.81	32	63.0	12
19.7	14.05	38	47.0	4	16.67	29	51.7	19	15.53	39	16.4	24	40.10	29	62.3	7
ar. 1.6	14.39	34	47.9	9	16.93	26	53.4	17	15.88	35	18.9	25	40.36	26	62.0	3
11.6	14.68	29	49.3	14	17.16	23	55.0	16	16.18	30	21.5	26	40.59	23	62.1	1
21.6	14.91	23	51.2	19	17.36	20	56.4	14	16.44	26	24.2	27	40.78	19	62.6	5
31.6	15.08	17	53.5	23	17.52	16	57.6	12	16.66	22	26.8	26	40.93	15	63.4	8
pr. 10.5	15.20	12	56.0	25	17.65	13	58.6	10	16.83	17	29.4	26	41.05	12	64.5	11
20.5	15.26	6	58.6	26	17.74	9	59.5	9	16.96	13	31.8	24	41.14	9	65.8	13
30.5	15.27	1	61.3	27	17.81	7	60.1	6	17.04	8	34.1	23	41.19	5	67.3	15
ay 10.4	15.23	4	63.9	26	17.84	3	60.6	5	17.09	5	36.2	21	41.21	2	68.8	15
20.4	15.14	9	66.4	25	17.85	1	60.9	3	17.09	0	38.1	19	41.20	1	70.3	15
30.4	15.02	12	68.6	22	17.84	1	61.1	2	17.06	3	39.7	16	41.17	3	71.8	15
une 9.4	14.86	16	70.5	19	17.81	3	61.1	0	16.99	7	41.0	13	41.12	5	73.2	14
19.3	14.68	18	72.1	16	17.75	6	61.0	1	16.88	11	42.0	10	41.04	8	74.4	12
29.3	14.47	21	73.2	11	17.67	8	60.7	3	16.75	13	42.7	7	40.95	9	75.4	10
uly 9.3	14.24	23	74.0	8	17.58	9	60.4	3	16.59	16	43.1	4	40.84	11	76.3	9
19.3	14.00	24	74.3	3	17.47	11	59.9	5	16.41	18	43.0	1	40.72	12	76.9	6
29.2	13.76	24	74.1	2	17.36	11	59.3	6	16.22	19	42.6	4	40.60	12	77.2	3
ug. 8.2	13.52	24	73.4	7	17.24	12	58.6	7	16.02	20	41.9	7	40.47	13	77.3	1
18.2	13.29	23	72.3	11	17.12	12	57.9	7	15.82	20	40.9	10	40.34	13	77.1	2
28.1	13.08	21	70.7	16	17.01	11	57.2	7	15.64	18	39.5	14	40.22	12	76.6	5
ept. 7.1	12.89	19	68.8	19	16.91	10	56.5	7	15.48	16	37.9	16	40.11	11	75.9	7
17.1	12.73	16	66.4	24	16.83	8	55.8	7	15.35	13	36.1	18	40.02	9	74.9	10
27.1	12.61	12	63.7	27	16.79	4	55.1	7	15.27	8	34.2	19	39.96	6	73.6	13
ct. 7.0	12.54	7	60.7	30	16.78	1	54.6	5	15.24	3	32.3	19	39.93	3	72.0	16
17.0	12.52	2	57.5	32	16.82	4	54.3	3	15.27	3	30.4	19	39.95	2	70.1	19
27.0	12.57	5	54.0	35	16.90	8	54.3	0	15.37	10	28.7	17	40.01	6	68.0	21
ov. 6.0	12.68	11	50.5	35	17.04	14	54.5	2	15.54	17	27.2	15	40.12	11	65.7	23
15.9	12.85	17	46.9	36	17.22	18	54.9	4	15.77	23	25.9	13	40.27	15	63.2	25
25.9	13.09	24	43.4	35	17.45	23	55.7	8	16.07	30	25.1	8	40.48	21	60.6	26
Dec. 5.9	13.38	29	40.0	34	17.73	28	56.8	11	16.42	35	24.7	4	40.73	25	57.9	27
15.8	13.73	35	36.9	31	18.04	31	58.1	13	16.82	40	24.7	0	41.01	28	55.3	26
25.8	14.12	39	34.1	28	18.37	33	59.7	16	17.26	44	25.1	4	41.33	32	52.8	25
35.8	14.54	42	31.8	23	18.72	35	61.4	17	17.71	45	26.0	9	41.66	33	50.4	24
ec δ, Tan δ	1.547		+1.181		1.050		−0.319		1.463		−1.068		1.056		+0.341	
ean Place	11s.605		73″.63		14s.978		40″.10		13s.771		13″.73		38s.254		84″.20	
$\psi\alpha$, $D_\omega \alpha$	−0.01		+0.07		0.00		−0.02		+0.01		−0.06		0.00		+0.02	
$\psi\delta$, $D_\omega \delta$	−0.4		−0.4		−0.4		−0.4		−0.4		−0.5		−0.4		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**θ Apodis.** Var. 5.5–6.6				**τ Virginis.** Mag. 4.3				**11 Boötis.** Mag. 6.1				**β Centauri.** Mag. 0.9		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	13 56		−76 23		13 57		+ 1 56		13 57		+27 47		13 57		−59
	s		″		s		″		s		″		s		″
Jan. 0.8	57.52		2.2		19.27		70.7		19.48		31.0		47.91		39.4
10.8	58.65	113	2.5	3	19.60	33	68.6	21	19.83	35	28.7	23	48.50	59	40.2
20.7	59.79	114	3.4	9	19.93	33	66.6	20	20.19	36	26.9	18	49.09	59	41.4
30.7	60.90	111	4.8	14	20.26	33	64.8	18	20.54	35	25.4	15	49.67	58	43.1
Feb. 9.7	61.97	107	6.8	20	20.57	31	63.2	16	20.87	33	24.4	10	50.22	55	45.2
19.7	62.96	99	9.1	23	20.86	29	61.9	13	21.18	31	23.9	5	50.73	51	47.5
Mar. 1.6	63.86	90	11.9	28	21.12	26	61.0	9	21.46	28	24.0	1	51.19	46	50.2
11.6	64.66	80	14.9	30	21.35	23	60.3	7	21.70	24	24.4	4	51.60	41	53.0
21.6	65.33	67	18.2	33	21.55	20	59.9	4	21.90	20	25.4	10	51.95	35	56.0
31.6	65.88	55	21.6	34	21.71	16	59.8	1	22.07	17	26.7	13	52.24	29	59.1
Apr. 10.5	66.30	42	25.1	35	21.84	13	60.0	2	22.19	12	28.2	15	52.47	23	62.1
20.5	66.59	29	28.6	35	21.93	9	60.4	4	22.28	9	30.0	18	52.64	17	65.1
30.5	66.74	15	32.0	34	22.00	7	60.9	5	22.33	5	31.9	19	52.75	11	68.0
May 10.4	66.76	2	35.3	33	22.04	4	61.6	7	22.35	2	33.9	20	52.80	5	70.7
20.4	66.65	11	38.4	31	22.06	2	62.3	7	22.34	1	35.8	19	52.80	0	73.2
30.4	66.41	24	41.3	29	22.05	1	63.2	9	22.30	4	37.6	18	52.73	7	75.4
June 9.4	66.04	37	43.8	25	22.02	3	64.0	8	22.23	7	39.3	17	52.62	11	77.3
19.3	65.58	46	45.9	21	21.96	6	64.8	8	22.14	9	40.8	15	52.45	17	78.9
29.3	65.01	57	47.6	17	21.89	7	65.5	7	22.03	11	42.0	12	52.24	21	80.1
July 9.3	64.37	64	48.8	12	21.80	9	66.2	7	21.91	12	42.9	9	51.99	25	80.8
19.3	63.67	70	49.5	7	21.70	10	66.8	6	21.77	14	43.5	6	51.72	27	81.1
29.2	62.93	74	49.6	1	21.59	11	67.4	6	21.62	15	43.8	3	51.42	30	81.0
Aug. 8.2	62.18	75	49.2	4	21.47	12	67.8	4	21.47	15	43.8	0	51.12	30	80.4
18.2	61.45	73	48.3	9	21.36	11	68.0	2	21.32	15	43.4	4	50.82	30	79.4
28.1	60.77	68	46.9	14	21.24	12	68.2	2	21.18	14	42.7	7	50.54	28	78.0
Sept. 7.1	60.16	61	45.0	19	21.14	10	68.2	0	21.05	13	41.6	11	50.29	25	76.2
17.1	59.66	50	42.7	23	21.06	8	68.0	2	20.95	10	40.2	14	50.08	21	74.2
27.1	59.29	37	40.1	26	21.01	5	67.5	5	20.87	8	38.5	17	49.94	14	71.9
Oct. 7.0	59.08	21	37.3	28	20.99	2	66.9	6	20.83	4	36.5	20	49.87	7	69.5
17.0	59.04	4	34.4	29	21.01	2	66.0	9	20.82	1	34.2	23	49.88	1	67.1
27.0	59.18	14	31.5	29	21.07	6	64.9	11	20.87	5	31.7	25	49.98	10	64.8
Nov. 6.0	59.51	33	28.7	28	21.18	11	63.6	13	20.97	10	29.0	27	50.17	19	62.6
15.9	60.02	51	26.2	25	21.34	16	62.0	16	21.12	15	26.1	29	50.46	29	60.7
25.9	60.71	69	24.1	21	21.54	20	60.2	18	21.32	20	23.1	30	50.82	36	59.1
Dec. 5.9	61.54	83	22.3	18	21.79	25	58.2	20	21.56	24	20.2	29	51.26	44	58.0
15.8	62.49	95	21.1	12	22.07	28	56.2	20	21.85	29	17.3	29	51.77	51	57.4
25.8	63.54	105	20.4	7	22.38	31	54.0	22	22.17	32	14.6	27	52.32	55	57.3
35.8	64.65	111	20.3	1	22.70	32	51.9	21	22.51	34	12.1	25	52.90	58	57.7
Sec δ, Tan δ	4.250		−4.130		1.001		+0.034		1.130		+0.527		1.998		−1.730
Mean Place	$60^{s}.213$		$13''.79$		$19^{s}.165$		$79''.56$		$19^{s}.286$		$47''.97$		$48^{s}.819$		$48''.55$
$D'_{\psi}\,a$, $D_{\omega}\,a$	+0.05		−0.24		0.00		0.00		−0.01		+0.03		+0.02		−0.10
$D'_{\psi}\,\delta$, $D_{\omega}\,\delta$	−0.3		−0.5		−0.3		−0.5		−0.3		−0.5		−0.3		−0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	*π* Hydræ. Mag. 3.5				*θ* Centauri. Mag. 2.3				*α* Draconis. Mag. 3.6				*d* Boötis. Mag. 4.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 14 1		° ′ −26 16		h m 14 1		° ′ −35 57		h m 14 2		° ′ +64 46		h m 14 6		° ′ +25 29	
	s		″		s		″		s		″		s		″	
an. 0.8	31.49		24.0		40.21		5.0		5.33		29.8		31.51		21.2	
10.8	31.86	37	25.6	16	40.61	40	6.4	14	5.91	58	27.8	20	31.86	35	18.9	23
20.8	32.23	37	27.4	18	41.01	40	8.0	16	6.51	60	26.4	14	32.21	35	17.0	19
30.7	32.59	36	29.2	18	41.41	40	9.9	19	7.11	60	25.7	7	32.55	34	15.4	16
eb. 9.7	32.93	34	31.2	20	41.78	37	11.9	20	7.70	59	25.6	1	32.88	33	14.3	11
19.7	33.25	32	33.2	20	42.12	34	14.1	22	8.25	55	26.2	6	33.19	31	13.7	6
ar. 1.6	33.54	29	35.1	19	42.43	31	16.3	22	8.74	49	27.4	12	33.47	28	13.6	1
11.6	33.80	26	37.0	19	42.71	28	18.5	22	9.16	42	29.2	18	33.72	25	14.0	4
21.6	34.02	22	38.8	18	42.95	24	20.7	22	9.51	35	31.4	22	33.93	21	14.8	8
31.6	34.21	19	40.4	16	43.16	21	22.8	21	9.77	26	34.0	26	34.11	18	15.9	11
pr. 10.5	34.36	15	41.8	14	43.32	16	24.8	20	9.94	17	36.9	29	34.24	13	17.4	15
20.5	34.48	12	43.1	13	43.45	13	26.6	18	10.02	8	39.9	30	34.34	10	19.0	16
30.5	34.57	9	44.3	12	43.54	9	28.3	17	10.02	0	42.9	30	34.40	6	20.9	19
May 10.5	34.63	6	45.3	10	43.60	6	29.9	16	9.94	8	45.8	29	34.43	3	22.8	19
20.4	34.65	2	46.1	8	43.63	3	31.2	13	9.78	16	48.6	28	34.43	0	24.6	18
30.4	34.65	0	46.7	6	43.62	1	32.3	11	9.55	23	51.1	25	34.40	3	26.4	18
June 9.4	34.62	3	47.1	4	43.58	4	33.2	9	9.27	28	53.2	21	34.35	5	28.1	17
19.3	34.57	5	47.3	2	43.51	7	33.9	7	8.94	33	55.0	18	34.27	8	29.6	15
29.3	34.49	8	47.4	1	43.42	9	34.3	4	8.56	38	56.2	12	34.17	10	30.8	12
July 9.3	34.40	9	47.3	1	43.30	12	34.4	1	8.15	41	57.0	8	34.05	12	31.8	10
19.3	34.28	12	47.0	3	43.17	13	34.3	1	7.73	42	57.2	2	33.92	13	32.5	7
29.2	34.15	13	46.5	5	43.02	15	33.9	4	7.30	43	57.0	2	33.77	15	32.9	4
Aug. 8.2	34.02	13	45.8	7	42.86	16	33.3	6	6.86	44	56.2	8	33.62	15	33.0	1
18.2	33.88	14	45.1	7	42.70	16	32.4	9	6.44	42	54.9	13	33.48	14	32.7	3
28.2	33.75	13	44.2	9	42.55	15	31.3	11	6.05	39	53.2	17	33.33	15	32.1	6
Sept. 7.1	33.64	11	43.2	10	42.41	14	30.1	12	5.69	36	50.9	23	33.20	13	31.2	9
17.1	33.54	10	42.2	10	42.30	11	28.7	14	5.37	32	48.3	26	33.09	11	30.0	12
27.1	33.48	6	41.2	10	42.23	7	27.3	14	5.11	26	45.3	30	33.01	8	28.4	16
Oct. 7.0	33.46	2	40.2	10	42.20	3	25.9	14	4.92	19	42.0	33	32.96	5	26.5	19
17.0	33.48	2	39.4	8	42.22	2	24.6	13	4.81	11	38.4	36	32.95	1	24.4	21
27.0	33.55	7	38.8	6	42.29	7	23.4	12	4.78	3	34.7	37	32.99	4	22.0	24
Nov. 6.0	33.68	13	38.4	4	42.42	13	22.5	9	4.84	6	30.8	39	33.08	9	19.4	26
15.9	33.86	18	38.3	1	42.62	20	21.8	7	5.01	17	27.0	38	33.22	14	16.6	28
25.9	34.09	23	38.6	3	42.87	25	21.5	3	5.26	25	23.2	38	33.40	18	13.7	29
Dec. 5.9	34.36	27	39.1	5	43.17	30	21.5	0	5.60	34	19.7	35	33.64	24	10.8	29
15.9	34.68	32	39.9	8	43.51	34	21.9	4	6.03	43	16.5	32	33.92	28	7.9	29
25.8	35.02	34	41.1	12	43.88	37	22.7	8	6.52	49	13.6	29	34.23	31	5.2	27
35.8	35.38	36	42.5	14	44.27	39	23.8	11	7.07	55	11.3	23	34.56	33	2.7	25
Sec δ, Tan δ	1.115		−0.494		1.235		−0.725		2.347		+2.123		1.108		+0.477	
Mean Place	31ˢ.624		24″.30		40ˢ.478		8″.22		5ˢ.304		54″.53		31ˢ.390		37″.59	
$D'_\psi \alpha$, $D_\omega \alpha$	+0.01		−0.03		+0.01		−0.04		−0.03		+0.12		−0.01		+0.03	
$D_\psi \delta$, $D_\omega \delta$	−0.3		−0.5		−0.3		−0.5		−0.3		−0.5		−0.3		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*κ* Virginis. Mag. 4.3				4 Ursæ Minoris. Mag. 5.0				*ι* Virginis. Mag. 4.2				*α* Boötis. (*Arcturus.*) Mag. 0.2		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decli- tion
	h m 14 8 s		° ′ − 9 52 ″		h m 14 9 s		° ′ +77 56 ″		h m 14 11 s		° ′ − 5 35 ″		h m 14 11 s		° +19 ″
Jan. 0.8	21.53		48.0		8.94		23.1		33.29		49.9		47.11		73.4
10.8	21.87	34	49.9	19	9.97	103	21.2	19	33.62	33	51.9	20	47.44	33	71.0
20.8	22.21	34	51.8	19	11.07	110	20.0	12	33.96	34	53.8	19	47.78	34	69.0
30.7	22.55	34	53.7	19	12.18	111	19.4	6	34.29	33	55.7	19	48.12	34	67.3
Feb. 9.7	22.87	32	55.4	17	13.28	110	19.5	1	34.61	32	57.4	17	48.44	32	66.0
19.7	23.17	30	57.0	16	14.32	104	20.3	8	34.91	30	58.9	15	48.74	30	65.1
Mar. 1.6	23.44	27	58.4	14	15.26	94	21.7	14	35.18	27	60.1	12	49.02	28	64.8
11.6	23.68	24	59.6	12	16.07	81	23.7	20	35.42	24	61.1	10	49.26	24	64.8
21.6	23.89	21	60.5	9	16.73	66	26.1	24	35.63	21	61.9	8	49.46	20	65.2
31.6	24.07	18	61.2	7	17.21	48	28.9	28	35.81	18	62.4	5	49.64	18	66.0
Apr. 10.5	24.22	15	61.7	5	17.52	31	31.9	30	35.95	14	62.6	2	49.78	14	67.1
20.5	24.33	11	62.0	3	17.63	11	35.0	31	36.07	12	62.7	1	49.88	10	68.4
30.5	24.42	9	62.2	2	17.56	7	38.1	31	36.16	9	62.6	1	49.95	7	69.9
May 10.5	24.48	6	62.2	0	17.31	25	41.1	30	36.22	6	62.3	3	49.99	4	71.5
20.4	24.51	3	62.0	2	16.89	42	43.9	28	36.25	3	61.9	4	50.00	1	73.1
30.4	24.51	0	61.8	2	16.33	56	46.4	25	36.25	0	61.5	4	49.98	2	74.7
June 9.4	24.49	2	61.4	4	15.64	69	48.5	21	36.23	2	61.0	5	49.93	5	76.2
19.3	24.45	4	61.0	4	14.84	80	50.2	17	36.19	4	60.4	6	49.87	6	77.5
29.3	24.38	7	60.6	4	13.96	88	51.4	12	36.13	6	59.8	6	49.78	9	78.6
July 9.3	24.30	8	60.1	5	13.01	95	52.0	6	36.05	8	59.3	5	49.67	11	79.5
19.3	24.20	10	59.6	5	12.02	99	52.1	1	35.95	10	58.7	6	49.55	12	80.2
29.2	24.09	11	59.0	6	11.02	100	51.7	4	35.84	11	58.2	5	49.42	13	80.6
Aug. 8.2	23.97	12	58.5	5	10.03	99	50.8	9	35.72	12	57.7	5	49.28	14	80.8
18.2	23.85	12	58.0	5	9.06	97	49.3	15	35.60	12	57.3	4	49.14	14	80.6
28.2	23.73	12	57.5	5	8.14	92	47.4	19	35.48	12	56.9	4	49.00	14	80.2
Sept. 7.1	23.63	10	57.0	5	7.30	84	45.0	24	35.37	11	56.7	2	48.87	13	79.5
17.1	23.54	9	56.7	3	6.55	75	42.2	28	35.28	9	56.5	2	48.76	11	78.5
27.1	23.48	6	56.5	2	5.92	63	39.0	32	35.22	6	56.6	1	48.68	8	77.1
Oct. 7.0	23.45	3	56.5	0	5.42	50	35.5	35	35.18	4	56.8	2	48.63	5	75.5
17.0	23.46	1	56.6	1	5.07	35	31.9	36	35.19	1	57.2	4	48.62	1	73.6
27.0	23.52	6	57.0	4	4.89	18	28.0	39	35.25	6	57.8	6	48.66	4	71.5
Nov. 6.0	23.62	10	57.6	6	4.89	0	24.1	39	35.35	10	58.7	9	48.74	8	69.2
15.9	23.78	16	58.5	9	5.07	18	20.3	38	35.50	15	59.8	11	48.87	13	66.6
25.9	23.98	20	59.6	11	5.43	36	16.6	37	35.69	19	61.2	14	49.05	18	63.9
Dec. 5.9	24.23	25	60.9	13	5.97	54	13.1	35	35.93	24	62.7	15	49.28	23	61.1
15.9	24.51	28	62.5	16	6.68	71	9.9	32	36.21	28	64.5	18	49.55	27	58.4
25.8	24.82	31	64.2	17	7.53	85	7.2	27	36.51	30	66.4	19	49.85	30	55.8
35.8	25.15	33	66.0	18	8.50	97	5.0	22	36.84	33	68.3	19	50.17	32	53.3
Sec δ, Tan δ	1.015		−0.174		4.787		+4.681		1.005		−0.098		1.062		+0.356
Mean Place	$21^{s}.561$		$42''.89$		$9^{s}.611$		$48''.72$		$33^{s}.307$		$43''.30$		$47^{s}.030$		$88''.04$
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		−0.01		−0.07		+0.26		0.00		−0.01		−0.01		+0.02
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		−0.5		−0.3		−0.5		−0.3		−0.5		−0.3		−0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	λ Boötis. Mag. 4.3				λ Virginis. Mag. 4.6				2 Libræ. Mag. 6.3				θ Boötis. Mag. 4.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	14 13		+46 28		14 14		−12 58		14 18		−11 19		14 22		+52 13	
	s		″		s		″		s		″		s		″	
Jan. 0.8	9.28		19.9		30.35		53.7		50.94		39.7		18.14		73.0	
10.8	9.68	40	17.6	23	30.69	34	55.5	18	51.28	34	41.6	19	18.57	43	70.6	24
20.8	10.10	42	15.8	18	31.04	35	57.3	18	51.62	34	43.4	18	19.02	45	68.8	18
30.7	10.51	41	14.5	13	31.38	34	59.1	18	51.96	34	45.2	18	19.47	45	67.6	12
Feb. 9.7	10.91	40	13.9	6	31.70	32	60.9	18	52.28	32	47.0	18	19.91	44	66.9	7
19.7	11.29	38	13.9	0	32.01	31	62.5	16	52.59	31	48.6	16	20.33	42	67.0	1
Mar. 1.7	11.64	35	14.4	5	32.28	27	64.0	15	52.87	28	50.0	14	20.71	38	67.6	6
11.6	11.94	30	15.6	12	32.53	25	65.3	13	53.12	25	51.2	12	21.05	34	68.8	12
21.6	12.19	25	17.2	16	32.75	22	66.4	11	53.34	22	52.2	10	21.34	29	70.6	18
31.6	12.40	21	19.2	20	32.94	19	67.2	8	53.52	18	52.9	7	21.57	23	72.8	22
Apr. 10.5	12.55	15	21.6	24	33.09	15	67.9	7	53.68	16	53.5	6	21.74	17	75.3	25
20.5	12.66	11	24.1	25	33.21	12	68.4	5	53.81	13	53.9	4	21.86	12	78.0	27
30.5	12.71	5	26.8	27	33.31	10	68.7	3	53.91	10	54.1	2	21.92	6	80.8	28
May 10.5	12.71	0	29.5	27	33.37	6	68.9	2	53.98	7	54.1	0	21.92	0	83.6	28
20.4	12.67	4	32.1	26	33.41	4	68.9	0	54.02	4	54.0	1	21.87	5	86.4	28
30.4	12.59	8	34.5	24	33.42	1	68.8	1	54.03	1	53.9	1	21.78	9	88.9	25
June 9.4	12.48	11	36.6	21	33.41	1	68.6	2	54.02	1	53.6	3	21.64	14	91.2	23
19.4	12.33	15	38.5	19	33.37	4	68.3	3	53.98	4	53.3	3	21.46	18	93.2	20
29.3	12.15	18	40.0	15	33.31	6	68.0	3	53.93	5	52.9	4	21.25	21	94.7	15
July 9.3	11.95	20	41.0	10	33.23	8	67.6	4	53.85	8	52.4	5	21.01	24	95.9	12
19.3	11.73	22	41.7	7	33.13	10	67.1	5	53.75	10	51.9	5	20.75	26	96.6	7
29.2	11.51	22	41.8	1	33.01	12	66.6	5	53.64	11	51.4	5	20.48	27	96.8	2
Aug. 8.2	11.27	24	41.6	2	32.89	12	66.0	6	53.52	12	50.9	5	20.20	28	96.5	3
18.2	11.04	23	40.9	7	32.76	13	65.5	5	53.39	13	50.4	5	19.92	28	95.7	8
28.2	10.82	22	39.7	12	32.64	12	64.9	6	53.27	12	49.9	5	19.65	27	94.5	12
Sept. 7.1	10.61	21	38.1	16	32.53	11	64.4	5	53.15	12	49.4	5	19.40	25	92.8	17
17.1	10.44	17	36.2	19	32.44	9	63.9	5	53.06	9	49.0	4	19.17	23	90.7	21
27.1	10.29	15	33.8	24	32.37	7	63.6	3	52.99	7	48.7	3	18.98	19	88.2	25
Oct. 7.1	10.19	10	31.0	28	32.34	3	63.4	2	52.95	4	48.6	1	18.84	14	85.3	29
17.0	10.13	6	28.0	30	32.34	0	63.4	0	52.95	0	48.7	1	18.76	8	82.2	31
27.0	10.13	0	24.8	32	32.40	6	63.5	1	53.00	5	49.0	3	18.73	3	78.8	34
Nov. 6.0	10.20	7	21.3	35	32.50	10	63.9	4	53.09	9	49.4	4	18.77	4	75.2	36
15.9	10.32	12	17.8	35	32.65	15	64.6	7	53.24	15	50.2	8	18.88	11	71.5	37
25.9	10.51	19	14.3	35	32.85	20	65.5	9	53.43	19	51.2	10	19.06	18	67.8	37
Dec. 5.9	10.76	25	10.8	35	33.10	25	66.6	11	53.67	24	52.4	12	19.31	25	64.2	36
15.9	11.06	30	7.6	32	33.38	28	68.0	14	53.95	28	53.9	15	19.62	31	60.8	34
25.8	11.41	35	4.6	30	33.69	31	69.6	16	54.26	31	55.5	16	19.98	36	57.8	30
35.8	11.80	39	2.0	26	34.02	33	71.3	17	54.59	33	57.3	18	20.39	41	55.1	27
Sec δ, Tan δ	1.452		+1.053		1.026		−0.231		1.020		−0.200		1.633		+1.291	
Mean Place	$9^{s}.239$		$41''.47$		$30^{s}.430$		$49''.37$		$51^{s}.030$		$34''.81$		$18^{s}.243$		$95''.61$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.02		+0.06		0.00		−0.01		0.00		−0.01		−0.02		+0.07	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.3		−0.5		−0.3		−0.6		−0.3		−0.6		−0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	***f* Boötis.** Mag. 5.4				***φ* Virginis.** Mag. 5.0				**5 Ursæ Minoris.** Mag. 4.4				***ρ* Boötis.** Mag. 3.8		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	14 22		+19 35		14 23		− 1 50		14 27		+76 3		14 28		+30 4
	s		″		s		″		s		″		s		″
Jan. 0.8	30.13		76.0		49.22		58.8		40.22		60.9		10.00		20.7
10.8	30.46	33	73.6	24	49.55	33	60.8	20	41.09	87	58.8	21	10.34	34	18.3
20.8	30.80	34	71.6	20	49.88	33	62.7	19	42.03	94	57.3	15	10.70	36	16.2
30.7	31.14	34	69.9	17	50.21	33	64.5	18	43.01	98	56.5	8	11.05	35	14.6
Feb. 9.7	31.47	33	68.6	13	50.53	32	66.1	16	43.98	97	56.3	2	11.40	35	13.5
19.7	31.77	30	67.8	8	50.83	30	67.5	14	44.91	93	56.8	5	11.73	33	13.0
Mar. 1.7	32.06	29	67.4	4	51.11	28	68.6	11	45.76	85	58.0	12	12.03	30	12.9
11.6	32.31	25	67.5	1	51.36	25	69.4	8	46.52	76	59.7	17	12.30	27	13.4
21.6	32.53	22	67.9	4	51.57	21	69.9	5	47.16	64	61.9	22	12.54	24	14.4
31.6	32.71	18	68.8	9	51.76	19	70.2	3	47.65	49	64.6	27	12.74	20	15.7
Apr. 10.6	32.86	15	70.0	12	51.91	15	70.2	0	47.99	34	67.5	29	12.89	15	17.4
20.5	32.98	12	71.4	14	52.04	13	70.0	2	48.17	18	70.6	31	13.01	12	19.4
30.5	33.06	8	72.9	15	52.14	10	69.6	4	48.19	2	73.8	32	13.10	9	21.5
May 10.5	33.11	5	74.6	17	52.20	6	69.1	5	48.05	14	76.9	31	13.14	4	23.6
20.4	33.13	2	76.3	17	52.24	4	68.5	6	47.77	28	79.8	29	13.15	1	25.8
30.4	33.12	1	78.0	17	52.26	2	67.8	7	47.35	42	82.5	27	13.13	2	27.9
June 9.4	33.09	3	79.5	15	52.25	1	67.1	7	46.81	54	84.8	23	13.08	5	29.9
19.4	33.03	6	81.0	15	52.21	4	66.4	7	46.17	64	86.7	19	13.00	8	31.6
29.3	32.95	8	82.2	12	52.15	6	65.7	7	45.44	73	88.2	15	12.90	10	33.1
July 9.3	32.85	10	83.2	10	52.07	8	65.0	7	44.65	79	89.1	9	12.77	13	34.3
19.3	32.73	12	84.1	9	51.98	9	64.4	6	43.81	84	89.6	5	12.63	14	35.2
29.2	32.60	13	84.6	5	51.87	11	63.8	6	42.94	87	89.5	1	12.47	16	35.7
Aug. 8.2	32.46	14	84.8	2	51.75	12	63.3	5	42.07	87	88.8	7	12.30	17	35.8
18.2	32.32	14	84.8	0	51.62	13	63.0	3	41.21	86	87.6	12	12.13	17	35.6
28.2	32.18	14	84.5	3	51.50	12	62.7	3	40.38	83	86.0	16	11.96	17	35.0
Sept. 7.1	32.04	14	83.9	6	51.38	12	62.6	1	39.60	78	83.8	22	11.80	16	34.1
17.1	31.93	11	83.0	9	51.28	10	62.6	0	38.90	70	81.3	25	11.66	14	32.8
27.1	31.84	9	81.8	12	51.21	7	62.8	2	38.29	61	78.3	30	11.55	11	31.1
Oct. 7.1	31.78	6	80.3	15	51.16	5	63.1	3	37.79	50	75.0	33	11.47	8	29.1
17.0	31.76	2	78.5	18	51.16	0	63.7	6	37.42	37	71.4	36	11.43	4	26.7
27.0	31.78	2	76.4	21	51.19	3	64.6	9	37.19	23	67.7	37	11.44	1	24.2
Nov. 6.0	31.86	8	74.1	23	51.28	9	65.6	10	37.12	7	63.8	39	11.50	6	21.4
15.9	31.98	12	71.6	25	51.42	14	66.9	13	37.20	8	60.0	38	11.60	10	18.4
25.9	32.15	17	69.0	26	51.60	18	68.4	15	37.45	25	56.2	38	11.77	17	15.3
Dec. 5.9	32.37	22	66.3	27	51.82	22	70.2	18	37.86	41	52.6	36	11.99	22	12.2
15.9	32.64	27	63.6	27	52.09	27	72.0	18	38.43	57	49.2	34	12.25	26	9.2
25.8	32.93	29	61.0	26	52.38	29	74.0	20	39.13	70	46.3	29	12.55	30	6.3
35.8	33.25	32	58.5	25	52.70	32	76.0	20	39.94	81	43.9	24	12.88	33	3.7
Sec δ, Tan δ	1.062		+0.356		1.001		−0.032		4.153		+4.031		1.163		+0.595
Mean Place	30ˢ.123		90″.67		49ˢ.280		50″.69		41ˢ.302		86″.15		10ˢ.035		38″.50
D′ψ α, Dω α	−0.01		+0.02		0.00		0.00		−0.06		+0.22		−0.01		+0.03
Dψ δ, Dω δ	−0.3		−0.6		−0.3		−0.6		−0.3		−0.6		−0.3		−0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	γ Boötis. Mag. 3.0 Right Ascension.		γ Boötis. Mag. 3.0 Declination N.		η Centauri. Mag. 2.6 Right Ascension.		η Centauri. Mag. 2.6 Declination S.		σ Boötis. Mag. 4.5 Right Ascension.		σ Boötis. Mag. 4.5 Declination N.		α² Centauri. Mag. 0.3 Right Ascension.		α² Centauri. Mag. 0.3 Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	14 28		+38 40		14 30		−41 47		14 30		+30 6		14 33		−60 28	
	s		″		s		″		s		″		s		″	
an. 0.8	39.30		26.9		5.71		2.5		58.76		32.5		48.49		52.7	
10.8	39.66	36	24.4	25	6.13	42	3.4	9	59.10	34	30.0	25	49.07	58	53.0	3
20.8	40.04	38	22.4	20	6.56	43	4.6	12	59.45	35	27.9	21	49.66	59	53.8	8
30.7	40.42	38	20.9	15	6.99	43	6.1	15	59.81	36	26.3	16	50.25	59	55.1	13
eb. 9.7	40.79	37	19.9	10	7.40	41	7.8	17	60.15	34	25.2	11	50.82	57	56.7	16
19.7	41.14	35	19.6	3	7.79	39	9.7	19	60.48	33	24.6	6	51.36	54	58.7	20
ar. 1.7	41.46	32	19.8	2	8.15	36	11.8	21	60.78	30	24.5	1	51.86	50	61.0	23
11.6	41.75	29	20.5	7	8.48	33	13.9	21	61.05	27	25.0	5	52.31	45	63.5	25
21.6	42.00	25	21.8	13	8.77	29	16.1	22	61.29	24	25.9	9	52.71	40	66.2	27
31.6	42.21	21	23.5	17	9.02	25	18.3	22	61.49	20	27.2	13	53.05	34	69.0	28
pr. 10.6	42.37	16	25.5	20	9.24	22	20.4	21	61.65	16	28.8	16	53.33	28	71.8	28
20.5	42.49	12	27.8	23	9.41	17	22.4	20	61.78	13	30.8	20	53.55	22	74.6	28
30.5	42.57	8	30.2	24	9.55	14	24.4	20	61.86	8	32.9	21	53.71	16	77.4	28
lay 10.5	42.61	4	32.7	25	9.65	10	26.2	18	61.91	5	35.0	21	53.81	10	80.1	27
20.4	42.61	0	35.1	24	9.71	6	27.8	16	61.93	2	37.2	22	53.84	3	82.6	25
30.4	42.57	4	37.5	24	9.73	2	29.3	15	61.91	2	39.3	21	53.82	2	84.9	23
une 9.4	42.50	7	39.6	21	9.72	1	30.5	12	61.87	4	41.2	19	53.73	9	86.9	20
19.4	42.39	11	41.5	19	9.67	5	31.5	10	61.79	8	43.0	18	53.59	14	88.6	17
29.3	42.26	13	43.1	16	9.59	8	32.3	8	61.69	10	44.5	15	53.40	19	90.0	14
uly 9.3	42.11	15	44.3	12	9.47	12	32.8	5	61.57	12	45.7	12	53.16	24	91.0	10
19.3	41.94	17	45.2	9	9.33	14	33.0	2	61.43	14	46.6	9	52.88	28	91.6	6
29.3	41.75	19	45.6	4	9.16	17	32.9	1	61.27	16	47.1	5	52.58	30	91.8	2
ug. 8.2	41.55	20	45.7	1	8.98	18	32.5	4	61.11	16	47.3	2	52.25	33	91.5	3
18.2	41.35	20	45.3	4	8.80	18	31.8	7	60.94	17	47.1	2	51.92	33	90.8	7
28.2	41.16	19	44.5	8	8.62	18	30.8	10	60.77	17	46.6	5	51.60	32	89.7	11
ept. 7.1	40.97	19	43.3	12	8.45	17	29.6	12	60.61	16	45.7	9	51.31	29	88.2	15
17.1	40.81	16	41.7	16	8.30	15	28.2	14	60.47	14	44.4	13	51.05	26	86.3	19
27.1	40.67	14	39.7	20	8.19	11	26.7	15	60.36	11	42.8	16	50.85	20	84.2	21
ct. 7.1	40.57	10	37.4	23	8.12	7	25.1	16	60.28	8	40.8	20	50.72	13	81.9	23
17.0	40.52	5	34.7	27	8.10	2	23.5	16	60.23	5	38.5	23	50.66	6	79.5	24
27.0	40.51	1	31.8	29	8.14	4	22.0	15	60.24	1	36.0	25	50.70	4	77.2	23
ov. 6.0	40.56	5	28.7	31	8.25	11	20.6	14	60.29	5	33.2	28	50.83	13	74.9	23
16.0	40.67	11	25.4	33	8.42	17	19.5	11	60.40	11	30.3	29	51.06	23	72.8	21
25.9	40.83	16	22.1	33	8.66	24	18.6	9	60.56	16	27.2	31	51.37	31	71.0	18
ec. 5.9	41.05	22	18.8	33	8.95	29	18.1	5	60.78	22	24.1	31	51.77	40	69.6	14
15.9	41.32	27	15.6	32	9.29	34	18.0	1	61.04	26	21.1	30	52.24	47	68.6	10
25.8	41.63	31	12.6	30	9.67	38	18.2	2	61.33	29	18.3	28	52.76	52	68.2	4
35.8	41.98	35	9.9	27	10.08	41	18.9	7	61.66	33	15.6	27	53.33	57	68.1	1
c δ, Tan δ	1.281		+0.800		1.341		−0.894		1.156		+0.580		2.030		−1.767	
ean Place	$39^{\mathrm{s}}.366$		$46''.56$		$6^{\mathrm{s}}.229$		$6''.06$		$58^{\mathrm{s}}.810$		$50''.05$		$48^{\mathrm{s}}.941$		$66''.76$	
ψ a, D_ψ a	−0.01		+0.04		+0.01		−0.05		−0.01		+0.03		+0.03		−0.09	
ψ δ, D_ψ δ	−0.3		−0.6		−0.3		−0.6		−0.3		−0.6		−0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	33 Boötis. Mag. 5.4				α Apodis. Mag. 3.8				μ Virginis. Mag. 4.0				ε Boötis. Mag. 2.7		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declin tion N
	h m		° ′		h m		° ′		h m		° ′		h m		°
	14 35		+44 45		14 37		−78 40		14 38		− 5 17		14 41		+27
	s		″		s		″		s		″		s		″
Jan. 0.8	40.34		53.9		10.33		56.8		34.58		28.5		16.37		38.3
10.8	40.72	38	51.4	25	11.64	131	56.5	3	34.90	32	30.4	19	16.70	33	35.8
20.8	41.11	39	49.3	21	13.00	136	56.7	2	35.24	34	32.3	19	17.05	35	33.7
30.7	41.52	41	47.8	15	14.37	137	57.4	7	35.57	33	34.1	18	17.40	35	32.0
Feb. 9.7	41.91	39	46.9	9	15.72	135	58.7	13	35.89	32	35.7	16	17.74	34	30.7
19.7	42.29	38	46.7	2	17.01	129	60.4	17	36.20	31	37.1	14	18.06	32	30.0
Mar. 1.7	42.64	35	47.0	3	18.21	120	62.6	22	36.49	29	38.3	12	18.36	30	29.8
11.6	42.96	32	47.9	9	19.32	111	65.2	26	36.75	26	39.2	9	18.64	28	30.1
21.6	43.23	27	49.3	14	20.31	99	68.0	28	36.98	23	39.9	7	18.88	24	30.8
31.6	43.46	23	51.2	19	21.16	85	71.1	31	37.18	20	40.3	4	19.09	21	32.0
Apr. 10.6	43.64	18	53.4	22	21.86	70	74.4	33	37.35	17	40.5	2	19.26	17	33.5
20.5	43.77	13	55.9	25	22.41	55	77.8	34	37.50	15	40.5	0	19.39	13	35.3
30.5	43.85	8	58.6	27	22.79	38	81.2	34	37.61	11	40.3	2	19.49	10	37.3
May 10.5	43.88	3	61.3	27	23.01	22	84.6	34	37.69	8	39.9	4	19.55	6	39.4
20.4	43.88	0	63.9	26	23.06	5	87.8	32	37.75	6	39.5	4	19.58	3	41.5
30.4	43.83	5	66.4	25	22.95	11	90.9	31	37.78	3	39.0	5	19.58	0	43.5
June 9.4	43.74	9	68.7	23	22.68	27	93.7	28	37.78	0	38.4	6	19.54	4	45.4
19.4	43.62	12	70.8	21	22.25	43	96.2	25	37.76	2	37.8	6	19.48	6	47.2
29.3	43.46	16	72.5	17	21.69	56	98.3	21	37.71	5	37.2	6	19.39	9	48.7
July 9.3	43.28	18	73.8	13	21.00	69	100.0	17	37.64	7	36.6	6	19.28	11	50.0
19.3	43.08	20	74.7	9	20.21	79	101.2	12	37.55	9	36.0	6	19.15	13	51.0
29.3	42.86	22	75.1	4	19.35	86	101.9	7	37.44	11	35.5	5	19.00	15	51.6
Aug. 8.2	42.63	23	75.2	1	18.44	91	102.0	1	37.32	12	35.0	5	18.84	16	51.9
18.2	42.40	23	74.7	5	17.51	93	101.6	4	37.19	13	34.6	4	18.68	16	51.8
28.2	42.17	23	73.8	9	16.61	90	100.7	9	37.06	13	34.2	4	18.51	17	51.4
Sept. 7.1	41.95	22	72.5	13	15.78	83	99.2	15	36.94	12	34.0	2	18.35	16	50.7
17.1	41.75	20	70.8	17	15.04	74	97.3	19	36.83	11	33.9	1	18.21	14	49.6
27.1	41.58	17	68.6	22	14.44	60	95.0	23	36.74	9	33.9	0	18.09	12	48.1
Oct. 7.1	41.46	12	66.1	25	14.00	44	92.4	26	36.69	5	34.1	2	18.00	9	46.3
17.0	41.38	8	63.2	29	13.76	24	89.5	29	36.67	2	34.5	4	17.95	5	44.2
27.0	41.35	3	60.1	31	13.73	3	86.6	29	36.69	2	35.1	6	17.94	1	41.8
Nov. 6.0	41.38	3	56.8	33	13.92	19	83.6	30	36.77	8	35.9	8	17.99	5	39.2
16.0	41.48	10	53.3	35	14.34	42	80.8	28	36.89	12	37.0	11	18.09	10	36.4
25.9	41.63	15	49.8	35	14.98	64	78.3	25	37.06	17	38.3	13	18.24	15	33.4
Dec. 5.9	41.85	22	46.3	35	15.82	84	76.1	22	37.28	22	39.8	15	18.44	20	30.4
15.9	42.12	27	43.0	33	16.83	101	74.3	18	37.54	26	41.4	16	18.69	25	27.5
25.8	42.44	32	39.9	31	17.98	115	73.0	13	37.83	29	43.2	18	18.97	28	24.7
35.8	42.80	36	37.1	28	19.25	127	72.2	8	38.14	31	45.1	19	19.29	32	22.0
Sec δ, Tan δ	1.408		+0.992		5.098		−4.999		1.004		−0.093		1.127		+0.51
Mean Place	40ˢ.501		74″.81		14ˢ.370		66″.42		34ˢ.732		21″.29		16ˢ.494		55″.1
D′ψ α, Dω α	−0.02		+0.05		+0.08		−0.26		0.00		0.00		−0.01		+0.0
Dψ δ, Dω δ	−0.3		−0.6		−0.3		−0.6		−0.3		−0.6		−0.3		−0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**109 Virginis.** Mag. 3.8				**8 Libræ.** Mag. 5.3				**α Libræ.** Mag. 2.9				**Groombridge 2164.** Mag. 5.7			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 14 41		° ′ + 2 14		h m 14 45		° ′ −15 38		h m 14 46		° ′ −15 41		h m 14 49		° ′ +59 37	
	s		″		s		″		s		″		s		″	
an. 0.8	56.88		52.1		58.68		44.2		10.13		25.3		16.31		57.5	
10.8	57.20	32	50.0	21	59.02	34	45.7	15	10.46	33	26.9	16	16.77	46	54.9	26
20.8	57.53	33	48.1	19	59.36	34	47.4	17	10.81	35	28.5	16	17.27	50	52.9	20
30.8	57.86	33	46.3	18	59.71	35	49.0	16	11.15	34	30.2	17	17.78	51	51.5	14
eb. 9.7	58.18	32	44.8	15	60.04	33	50.7	17	11.49	34	31.8	16	18.29	51	50.8	7
19.7	58.49	31	43.5	13	60.36	32	52.2	15	11.81	32	33.4	16	18.79	50	50.7	1
ar. 1.7	58.77	28	42.5	10	60.66	30	53.6	14	12.11	30	34.8	14	19.26	47	51.3	6
11.6	59.03	26	41.9	6	60.94	28	54.9	13	12.38	27	36.0	12	19.68	42	52.5	12
21.6	59.26	23	41.6	3	61.18	24	56.0	11	12.63	25	37.1	11	20.05	37	54.2	17
31.6	59.46	20	41.6	0	61.40	22	56.9	9	12.84	21	38.0	9	20.35	30	56.4	22
pr. 10.6	59.63	17	41.8	2	61.58	18	57.6	7	13.03	19	38.8	8	20.59	24	59.0	26
20.5	59.77	14	42.3	5	61.74	16	58.1	5	13.19	16	39.3	5	20.76	17	61.9	29
30.5	59.88	11	42.9	6	61.87	13	58.5	4	13.32	13	39.7	4	20.86	10	64.9	30
ay 10.5	59.97	9	43.7	8	61.97	10	58.8	3	13.41	9	40.0	3	20.88	2	68.0	31
20.5	60.02	5	44.6	9	62.04	7	58.9	1	13.48	7	40.1	1	20.84	4	71.0	30
30.4	60.05	3	45.5	9	62.08	4	58.9	0	13.52	4	40.1	0	20.74	10	73.8	28
une 9.4	60.05	0	46.5	10	62.09	1	58.9	0	13.54	2	40.1	0	20.58	16	76.4	26
19.4	60.02	3	47.4	9	62.07	2	58.7	2	13.52	2	39.9	2	20.36	22	78.7	23
29.3	59.97	5	48.3	9	62.03	4	58.5	2	13.48	4	39.7	2	20.10	26	80.6	19
uly 9.3	59.90	7	49.1	8	61.96	7	58.2	3	13.41	7	39.4	3	19.80	30	82.0	14
19.3	59.80	10	49.8	7	61.87	9	57.8	4	13.32	9	39.0	4	19.46	34	82.9	9
29.3	59.69	11	50.4	6	61.76	11	57.4	4	13.21	11	38.6	4	19.10	36	83.4	5
ug. 8.2	59.57	12	50.9	5	61.64	12	56.9	5	13.08	13	38.1	5	18.73	37	83.4	0
18.2	59.44	13	51.2	3	61.50	14	56.4	5	12.95	13	37.6	5	18.36	37	82.8	6
28.2	59.31	13	51.4	2	61.36	14	55.9	5	12.81	14	37.1	5	17.99	37	81.8	10
ept. 7.2	59.18	13	51.4	0	61.23	13	55.4	5	12.68	13	36.6	5	17.63	36	80.2	16
17.1	59.07	11	51.3	1	61.12	11	54.9	5	12.56	12	36.1	5	17.30	33	78.2	20
27.1	58.98	9	50.9	4	61.02	10	54.4	5	12.47	9	35.6	5	17.02	28	75.7	25
ct. 7.1	58.91	7	50.3	6	60.96	6	54.1	3	12.41	6	35.3	3	16.78	24	72.9	28
17.0	58.89	2	49.5	8	60.94	2	53.9	2	12.38	3	35.1	2	16.60	18	69.8	31
27.0	58.91	2	48.5	10	60.96	2	53.8	1	12.41	3	35.0	1	16.49	11	66.3	35
ov. 6.0	58.97	6	47.2	13	61.03	7	54.0	2	12.48	7	35.2	2	16.46	3	62.7	36
16.0	59.08	11	45.7	15	61.15	12	54.4	4	12.60	12	35.6	4	16.51	5	58.9	38
25.9	59.25	17	44.0	17	61.33	18	55.0	6	12.77	17	36.2	6	16.65	14	55.1	38
Dec. 5.9	59.46	21	42.2	18	61.55	22	55.9	9	12.99	22	37.1	9	16.87	22	51.4	37
15.9	59.70	24	40.2	20	61.81	26	57.0	11	13.26	27	38.2	11	17.17	30	47.9	35
25.9	59.98	28	38.1	21	62.11	30	58.3	13	13.56	30	39.5	13	17.54	37	44.7	32
35.8	60.29	31	36.0	21	62.44	33	59.8	15	13.88	32	41.0	15	17.97	43	41.8	29
c δ, Tan δ	1.001		+0.039		1.038		−0.280		1.039		−0.281		1.978		+1.707	
ean Place	57ˢ.024		61″.72		58ˢ.934		39″.87		10ˢ.380		21″.05		16ˢ.884		80″.62	
$_{\psi}a$, $D_{\infty}a$	0.00		0.00		0.00		−0.01		0.00		−0.01		−0.03		+0.08	
$_{\psi}\delta$, $D_{\infty}\delta$	−0.3		−0.6		−0.3		−0.7		−0.3		−0.7		−0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Ursæ Minoris. Mag. 2.2				ξ² Libræ. Mag. 5.6				Piazzi 221. Mag. 5.8				β Lupi. Mag. 2.8		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.
	h m 14 50		° ′ +74 29		h m 14 52		° ′ −11 4		h m 14 52		° ′ +14 46		h m 14 52		° −42 4
	s		″		s		″		s		″		s		″
Jan. 0.8	54.92		45.8		8.93		8.0		12.26		67.8		56.70		29.9
10.8	55.67	75	43.4	24	9.26	33	9.7	17	12.58	32	65.5	23	57.12	42	30.5
20.8	56.49	82	41.6	18	9.59	33	11.4	17	12.90	32	63.4	21	57.55	43	31.4
30.8	57.36	87	40.4	12	9.93	34	13.1	17	13.23	33	61.6	18	57.98	43	32.7
Feb. 9.7	58.24	88	39.9	5	10.26	33	14.7	16	13.56	33	60.1	15	58.41	43	34.2
19.7	59.11	87	40.1	2	10.58	32	16.1	14	13.87	31	59.1	10	58.82	41	35.8
Mar. 1.7	59.92	81	41.0	9	10.88	30	17.4	13	14.16	29	58.5	6	59.20	38	37.7
11.7	60.65	73	42.4	14	11.15	27	18.5	11	14.43	27	58.3	2	59.55	35	39.6
21.6	61.28	63	44.4	20	11.39	24	19.3	8	14.67	24	58.5	2	59.87	32	41.6
31.6	61.80	52	46.9	25	11.61	22	20.0	7	14.88	21	59.1	6	60.15	28	43.7
Apr. 10.6	62.19	39	49.7	28	11.80	19	20.4	4	15.05	17	60.0	9	60.40	25	45.7
20.5	62.43	24	52.7	30	11.96	16	20.7	3	15.20	15	61.1	11	60.61	21	47.7
30.5	62.54	11	55.9	32	12.09	13	20.8	1	15.32	12	62.5	14	60.78	17	49.6
May 10.5	62.50	4	59.1	32	12.19	10	20.8	0	15.40	8	64.0	15	60.92	14	51.4
20.5	62.32	18	62.1	30	12.26	7	20.6	2	15.45	5	65.6	16	61.01	9	53.1
30.4	62.02	30	65.0	29	12.31	5	20.4	2	15.48	3	67.2	16	61.06	5	54.6
June 9.4	61.60	42	67.5	25	12.32	1	20.1	3	15.47	1	68.7	15	61.07	1	56.0
19.4	61.08	52	69.7	22	12.31	1	19.7	4	15.44	3	70.1	14	61.04	3	57.1
29.4	60.47	61	71.5	18	12.27	4	19.3	4	15.38	6	71.4	13	60.97	7	58.0
July 9.3	59.79	68	72.8	13	12.21	6	18.8	5	15.30	8	72.5	11	60.87	10	58.7
19.3	59.06	73	73.6	8	12.12	9	18.4	4	15.20	10	73.4	9	60.74	13	59.1
29.3	58.28	78	73.8	2	12.01	11	17.9	5	15.08	12	74.2	8	60.58	16	59.2
Aug. 8.2	57.49	79	73.6	2	11.89	12	17.4	5	14.94	14	74.6	4	60.40	18	58.9
18.2	56.69	80	72.8	8	11.76	13	17.0	4	14.80	14	74.8	2	60.21	19	58.4
28.2	55.91	78	71.5	13	11.62	14	16.5	5	14.65	15	74.8	0	60.01	20	57.6
Sept. 7.2	55.17	74	69.7	18	11.49	13	16.1	4	14.51	14	74.5	3	59.82	19	56.6
17.1	54.48	69	67.4	23	11.37	12	15.8	3	14.38	13	73.9	6	59.65	17	55.3
27.1	53.86	62	64.7	27	11.28	9	15.5	3	14.27	11	73.0	9	59.52	13	53.9
Oct. 7.1	53.34	52	61.7	30	11.21	7	15.4	1	14.19	8	71.8	12	59.42	10	52.3
17.0	52.92	42	58.3	34	11.18	3	15.4	0	14.14	5	70.4	14	59.38	4	50.7
27.0	52.63	29	54.7	36	11.20	2	15.6	2	14.14	0	68.7	17	59.39	1	49.2
Nov. 6.0	52.48	15	50.9	38	11.26	6	16.1	5	14.18	4	66.7	20	59.47	8	47.7
16.0	52.47	1	47.0	39	11.37	11	16.8	7	14.28	10	64.6	21	59.61	14	46.4
25.9	52.62	15	43.2	38	11.54	17	17.7	9	14.42	14	62.2	24	59.82	21	45.4
Dec. 5.9	52.92	30	39.5	37	11.75	21	18.8	11	14.62	20	59.7	25	60.10	28	44.7
15.9	53.36	44	36.0	35	12.00	25	20.1	13	14.85	23	57.2	25	60.42	32	44.4
25.9	53.93	57	32.9	31	12.29	29	21.6	15	15.12	27	54.7	25	60.79	37	44.3
35.8	54.62	69	30.2	27	12.60	31	23.2	16	15.43	31	52.3	24	61.20	41	44.7
Sec δ, Tan δ	3.741		+3.605		1.019		−0.196		1.034		+0.264		1.363		−0.026
Mean Place	56^s.467		70″.25		9^s.179		2″.22		12^s.434		81″.14		57^s.352		32″.73
D′$_\psi$ α, D$_\omega$ α	−0.06		+0.18		0.00		−0.01		0.00		+0.01		+0.02		−0.04
D$_\omega$ δ	−0.3		−0.7		−0.3		−0.7		−0.3		−0.7		−0.3		−0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	δ Libræ. Var. 4.8–6.2				β Boötis. Mag. 3.6				γ Scorpii. Mag. 3.4				ψ Boötis. Mag. 4.7			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	14 56		− 8 10		14 58		+40 42		14 59		−24 56		15 0		+27 16	
	s		″		s		″		s		″		s		″	
an. 0.8	25.44		63.1		44.33		71.4		5.11		56.6		47.94		25.9	
10.8	25.76	32	64.8	17	44.68	35	68.7	27	5.46	35	57.8	12	48.26	32	23.3	26
20.8	26.09	33	66.5	17	45.05	37	66.5	22	5.82	36	59.2	14	48.60	34	21.1	22
30.8	26.43	34	68.2	17	45.43	38	64.7	18	6.18	36	60.6	14	48.94	34	19.3	18
eb. 9.7	26.75	32	69.8	16	45.81	38	63.6	11	6.54	36	62.2	16	49.28	34	18.0	13
19.7	27.07	32	71.2	14	46.17	36	63.0	6	6.88	34	63.7	15	49.61	33	17.1	9
ar. 1.7	27.37	30	72.4	12	46.52	35	63.0	0	7.20	32	65.2	15	49.92	31	16.8	3
11.7	27.64	27	73.4	10	46.84	32	63.6	6	7.50	30	66.7	15	50.21	29	17.0	2
21.6	27.88	24	74.1	7	47.12	28	64.8	12	7.77	27	68.1	14	50.47	26	17.7	7
31.6	28.10	22	74.6	5	47.36	24	66.4	16	8.01	24	69.4	13	50.69	22	18.8	11
pr. 10.6	28.29	19	74.9	3	47.56	20	68.4	20	8.23	22	70.5	11	50.88	19	20.3	15
20.5	28.45	16	75.0	1	47.72	16	70.7	23	8.41	18	71.5	10	51.03	15	22.0	17
30.5	28.58	13	74.9	1	47.83	11	73.3	26	8.56	15	72.4	9	51.15	12	24.0	20
ay 10.5	28.69	11	74.7	2	47.90	7	75.9	26	8.68	12	73.2	8	51.23	8	26.1	21
20.5	28.76	7	74.4	3	47.93	3	78.5	26	8.77	9	73.8	6	51.28	5	28.3	22
30.4	28.81	5	74.0	4	47.92	1	81.1	26	8.82	5	74.4	6	51.29	1	30.5	22
June 9.4	28.83	2	73.5	5	47.87	5	83.5	24	8.84	2	74.8	4	51.28	1	32.5	20
19.4	28.82	1	73.0	5	47.78	9	85.7	22	8.84	0	75.1	3	51.23	5	34.4	19
29.4	28.78	4	72.4	6	47.66	12	87.6	19	8.80	4	75.3	2	51.15	8	36.0	16
July 9.3	28.72	6	71.9	5	47.51	15	89.1	15	8.73	7	75.3	0	51.05	10	37.4	14
19.3	28.63	9	71.4	5	47.33	18	90.2	11	8.64	9	75.2	1	50.92	13	38.5	11
29.3	28.52	11	70.9	5	47.13	20	91.0	8	8.52	12	75.0	2	50.77	15	39.3	8
Aug. 8.2	28.40	12	70.4	5	46.92	21	91.3	3	8.39	13	74.6	4	50.61	16	39.8	5
18.2	28.27	13	69.9	5	46.70	22	91.2	1	8.24	15	74.1	5	50.44	17	39.9	1
28.2	28.13	14	69.5	4	46.48	22	90.6	6	8.09	15	73.5	6	50.27	17	39.6	3
Sept. 7.2	28.00	13	69.2	3	46.27	21	89.6	10	7.94	15	72.8	7	50.10	17	39.0	6
17.1	27.88	12	69.0	2	46.07	20	88.2	14	7.81	13	72.0	8	49.94	16	38.0	10
27.1	27.78	10	68.9	1	45.89	18	86.4	18	7.70	11	71.2	8	49.80	14	36.7	13
Oct. 7.1	27.71	7	68.9	0	45.75	14	84.2	22	7.63	7	70.5	7	49.70	10	35.0	17
17.1	27.68	3	69.1	2	45.65	10	81.6	26	7.59	4	69.8	7	49.63	7	33.0	20
27.0	27.69	1	69.5	4	45.60	5	78.8	28	7.60	1	69.2	6	49.60	3	30.7	23
Nov. 6.0	27.75	6	70.1	6	45.61	1	75.6	32	7.67	7	68.7	5	49.62	2	28.2	25
16.0	27.85	10	70.9	8	45.67	6	72.4	32	7.78	11	68.5	2	49.70	8	25.4	28
25.9	28.01	16	72.0	11	45.80	13	69.0	34	7.96	18	68.6	1	49.83	13	22.5	29
Dec. 5.9	28.21	20	73.2	12	45.98	18	65.6	34	8.18	22	68.9	3	50.01	18	19.5	30
15.9	28.46	25	74.7	15	46.22	24	62.2	34	8.45	27	69.4	5	50.24	23	16.5	30
25.9	28.74	28	76.3	16	46.51	29	59.0	32	8.75	30	70.2	8	50.51	27	13.6	29
35.8	29.05	31	78.0	17	46.84	33	56.2	28	9.09	34	71.2	10	50.81	30	10.9	27
ec δ, Tan δ	1.010		−0.144		1.319		+0.861		1.103		−0.465		1.125		+0.516	
ean Place	25ˢ.691		56″.32		44ˢ.662		91″.03		5ˢ.502		54″.64		48ˢ.194		42″.50	
$D_\psi \alpha$, $D_\omega \alpha$	0.00		−0.01		−0.02		+0.04		+0.01		−0.02		−0.01		+0.02	
$D_\psi \delta$, $D_\omega \delta$	−0.3		−0.7		−0.3		−0.7		−0.3		−0.7		−0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	c Boötis. Mag. 5.0				ζ Lupi. Mag. 3.5				ι Libræ. Mag. 4.7				γ Triang. Aust. Mag. 3.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 15 3		° ′ +25 11		h m 15 6		° ′ −51 46		h m 15 7		° ′ −19 28		h m 15 10		° ′ −68 21	
	s		″		s		″		s		″		s		″	
Jan. 0.9	33.80	31	42.3	25	9.26	47	30.9	1	21.99	33	18.8	14	55.14	72	53.7	6
10.8	34.11	33	39.8	22	9.73	49	31.0	5	22.32	35	20.2	14	55.86	76	53.1	0
20.8	34.44	34	37.6	19	10.22	50	31.5	9	22.67	35	21.6	15	56.62	78	53.1	4
30.8	34.78	34	35.7	14	10.72	49	32.4	12	23.02	34	23.1	15	57.40	78	53.5	[illegible]
Feb. 9.7	35.12	33	34.3	9	11.21	48	33.6	15	23.36	34	24.6	14	58.18	76	54.4	14
19.7	35.45	31	33.4	3	11.69	46	35.1	18	23.70	31	26.0	14	58.94	72	55.8	[illegible]
Mar. 1.7	35.76	28	33.1	1	12.15	42	36.9	19	24.01	29	27.4	13	59.66	68	57.5	21
11.7	36.04	26	33.2	5	12.57	39	38.8	22	24.30	27	28.7	11	60.34	62	59.6	23
21.6	36.30	22	33.7	10	12.96	34	41.0	22	24.57	24	29.8	10	60.96	56	61.9	[illegible]
31.6	36.52	19	34.7	14	13.30	31	43.2	23	24.81	21	30.8	8	61.52	49	64.5	[illegible]
Apr. 10.6	36.71	16	36.1	17	13.61	26	45.5	23	25.02	18	31.6	7	62.01	41	67.3	[illegible]
20.6	36.87	12	37.8	19	13.87	22	47.8	23	25.20	16	32.3	5	62.42	33	70.1	30
30.5	36.99	9	39.7	20	14.09	16	50.1	22	25.36	12	32.8	5	62.75	25	73.1	[illegible]
May 10.5	37.08	6	41.7	21	14.25	12	52.3	21	25.48	9	33.3	3	63.00	16	76.0	[illegible]
20.5	37.14	2	43.8	21	14.37	7	54.4	20	25.57	7	33.6	2	63.16	8	78.9	27
30.4	37.16	1	45.9	20	14.44	2	56.4	19	25.64	3	33.8	1	63.24	2	81.6	[illegible]
June 9.4	37.15	4	47.9	18	14.46	3	58.3	16	25.67	0	33.9	0	63.22	10	84.2	23
19.4	37.11	7	49.7	16	14.43	8	59.9	13	25.67	3	33.9	0	63.12	18	86.5	20
29.4	37.04	10	51.3	14	14.35	12	61.2	11	25.64	6	33.9	2	62.94	26	88.5	17
July 9.3	36.94	12	52.7	11	14.23	17	62.3	7	25.58	8	33.7	2	62.68	33	90.2	13
19.3	36.82	14	53.8	8	14.06	20	63.0	4	25.50	11	33.5	3	62.35	39	91.5	9
29.3	36.68	15	54.6	5	13.86	22	63.4	0	25.39	13	33.2	4	61.96	43	92.4	3
Aug. 8.3	36.53	17	55.1	1	13.64	24	63.4	3	25.26	14	32.8	5	61.53	46	92.7	1
18.2	36.36	17	55.2	2	13.40	25	63.1	7	25.12	14	32.3	5	61.07	46	92.6	6
28.2	36.19	17	55.0	5	13.15	24	62.4	10	24.98	15	31.8	6	60.61	45	92.0	11
Sept. 7.2	36.02	15	54.5	9	12.91	22	61.4	14	24.83	13	31.2	5	60.16	41	90.9	15
17.1	35.87	13	53.6	12	12.69	19	60.0	16	24.70	11	30.7	6	59.75	35	89.4	19
27.1	35.74	11	52.4	16	12.50	13	58.4	18	24.59	8	30.1	5	59.40	27	87.5	[illegible]
Oct. 7.1	35.63	7	50.8	19	12.37	8	56.6	19	24.51	4	29.6	4	59.13	18	85.3	24
17.1	35.56	2	48.9	22	12.29	1	54.7	20	24.47	0	29.2	3	58.95	7	82.9	26
27.0	35.54	2	46.7	25	12.28	6	52.7	19	24.47	5	28.9	1	58.88	5	80.3	26
Nov. 6.0	35.56	7	44.2	26	12.34	14	50.8	18	24.52	10	28.8	1	58.93	18	77.7	26
16.0	35.63	13	41.6	29	12.48	22	49.0	15	24.62	16	28.9	3	59.11	30	75.1	24
26.0	35.76	18	38.7	29	12.70	29	47.5	13	24.78	21	29.2	6	59.41	42	72.7	21
Dec. 5.9	35.94	23	35.8	29	12.99	36	46.2	10	24.99	25	29.8	8	59.83	53	70.6	18
15.9	36.17	26	32.9	28	13.35	41	45.2	6	25.24	29	30.6	10	60.36	61	68.8	13
25.9	36.43	30	30.1	27	13.76	45	44.6	1	25.53	32	31.6	12	60.97	69	67.5	9
35.8	36.73		27.4		14.21		44.5		25.85		32.8		61.66		66.6	
Sec δ, Tan δ	1.105		+0.470		1.616		−1.270		1.061		−0.354		2.713		−2.522	
Mean Place	34ˢ.057		58″.37		10ˢ.234		34″.94		22ˢ.364		15″.06		57ˢ.253		60″.14	
$D'_\psi\,\alpha$, $D_\omega\,\alpha$	−0.01		+0.02		+0.02		−0.06		+0.01		−0.02		+0.05		−0.11	
$D'_\psi\,\delta$, $D_\omega\,\delta$	−0.3		−0.7		−0.3		−0.7		−0.3		−0.7		−0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	**8 Serpentis.** Mag. 5.4				**δ Boötis.** Mag. 3.5				**β Libræ.** Mag. 2.7				**γ Ursæ Minoris.** Mag. 3.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 15 10 s		° ′ + 5 14 ″		h m 15 12 s		° ′ +33 37 ″		h m 15 12 s		° ′ − 9 4 ″		h m 15 20 s		° ′ +72 7 ″	
n. 0.9	57.47		64.6		4.20		34.8		25.51		18.7		49.33		48.0	
10.8	57.77	30	62.5	21	4.52	32	32.1	27	25.83	32	20.4	17	49.94	61	45.3	27
20.8	58.09	32	60.5	20	4.87	35	29.8	23	26.16	33	22.0	16	50.63	69	43.1	22
30.8	58.42	33	58.7	18	5.22	35	27.9	19	26.49	33	23.6	16	51.37	74	41.5	16
b. 9.7	58.74	32	57.2	15	5.58	36	26.5	14	26.82	33	25.1	15	52.14	77	40.6	9
19.7	59.05	31	56.0	12	5.92	34	25.7	8	27.14	32	26.5	14	52.91	77	40.4	2
ar. 1.7	59.35	30	55.1	9	6.25	33	25.5	2	27.44	30	27.7	12	53.65	74	40.8	4
11.7	59.62	27	54.6	5	6.55	30	25.8	3	27.72	28	28.6	9	54.34	69	41.9	11
21.6	59.87	25	54.4	2	6.83	28	26.7	9	27.98	26	29.3	7	54.96	62	43.6	17
31.6	60.09	22	54.6	2	7.07	24	28.0	13	28.22	24	29.8	5	55.49	53	45.8	22
pr. 10.6	60.29	20	55.0	4	7.27	20	29.7	17	28.42	20	30.1	3	55.91	42	48.4	26
20.6	60.46	17	55.7	7	7.44	17	31.7	20	28.60	18	30.2	1	56.22	31	51.3	29
30.5	60.59	13	56.6	9	7.57	13	34.0	23	28.75	15	30.1	1	56.41	19	54.4	31
ay 10.5	60.70	11	57.6	10	7.66	9	36.4	24	28.87	12	29.9	2	56.48	7	57.6	32
20.5	60.78	8	58.8	12	7.72	6	38.8	24	28.96	9	29.6	3	56.42	6	60.8	32
30.4	60.83	5	60.0	12	7.73	1	41.2	24	29.02	6	29.2	4	56.25	17	63.9	31
ne 9.4	60.85	2	61.1	11	7.71	2	43.5	23	29.05	3	28.7	5	55.97	28	66.7	28
19.4	60.85	0	62.3	12	7.66	5	45.6	21	29.05	0	28.2	5	55.60	37	69.2	25
29.4	60.81	4	63.4	11	7.57	9	47.5	19	29.02	3	27.7	5	55.13	47	71.4	22
ly 9.3	60.75	6	64.3	9	7.46	11	49.1	16	28.97	5	27.2	5	54.59	54	73.1	17
19.3	60.66	9	65.2	9	7.32	14	50.4	13	28.89	8	26.7	5	53.98	61	74.3	12
29.3	60.55	11	65.9	7	7.15	17	51.3	9	28.79	10	26.2	5	53.33	65	75.1	8
ug. 8.3	60.43	12	66.4	5	6.96	19	51.8	5	28.67	12	25.8	4	52.64	69	75.3	2
18.2	60.29	14	66.8	4	6.77	19	51.9	1	28.53	14	25.3	5	51.94	70	75.0	3
28.2	60.15	14	67.0	2	6.57	20	51.6	3	28.39	14	24.9	4	51.23	71	74.2	8
ept. 7.2	60.01	14	67.0	0	6.38	19	50.9	7	28.26	13	24.6	3	50.54	69	72.8	14
17.1	59.88	13	66.8	2	6.20	18	49.8	11	28.13	13	24.3	3	49.89	65	71.0	18
27.1	59.76	12	66.4	4	6.04	16	48.4	14	28.02	11	24.2	1	49.29	60	68.7	23
ct. 7.1	59.67	9	65.7	7	5.91	13	46.5	19	27.94	8	24.2	0	48.76	53	66.0	27
17.1	59.62	5	64.8	9	5.82	9	44.3	22	27.89	5	24.3	1	48.32	44	62.9	31
27.0	59.61	1	63.7	11	5.77	5	41.8	25	27.88	1	24.6	3	47.98	34	59.5	34
ov. 6.0	59.64	3	62.3	14	5.77	0	39.0	28	27.92	4	25.2	6	47.76	22	55.9	36
16.0	59.73	9	60.7	16	5.82	5	36.0	30	28.01	9	25.9	7	47.66	10	52.2	37
26.0	59.86	13	58.9	18	5.93	11	32.8	32	28.15	14	26.8	9	47.70	4	48.3	39
ec. 5.9	60.04	18	57.0	19	6.10	17	29.6	32	28.34	19	28.0	12	47.88	18	44.5	38
15.9	60.26	22	54.9	21	6.32	22	26.4	32	28.58	24	29.3	13	48.19	31	40.9	36
25.9	60.52	26	52.7	22	6.59	27	23.4	30	28.85	27	30.8	15	48.62	43	37.6	33
35.8	60.81	29	50.6	21	6.89	30	20.5	29	29.15	30	32.4	16	49.17	55	34.6	30
c δ, Tan δ	1.004		+0.092		1.201		+0.665		1.013		−0.160		3.260		+3.102	
an Place	57^s.747		75″.36		4^s.567		52″.65		25^s.843		11″.92		51^s.290		71″.12	
$_\psi a$, D$_\omega a$	0.00		0.00		−0.01		+0.03		0.00		−0.01		−0.06		+0.13	
$_\psi \delta$, D$_\omega \delta$	−0.3		−0.7		−0.3		−0.7		−0.3		−0.7		−0.3		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*μ* **Boötis** *pr.* Mag. 4.5				*τ^1* **Serpentis.** Mag. 5.5				*ι* **Draconis.** Mag. 3.5				**32 Libræ.** Mag. 5.9		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Decli tio
	h m		° ′		h m		° ′		h m		° ′		h m		°
	15 21		+37 39		15 21		+15 43		15 23		+59 15		15 23		−16
	s		″		s		″		s		″		s		
Jan. 0.9	16.29		70.4		50.42		20.8		1.32		26.5		27.18		20.3
10.8	16.61	32	67.6	28	50.72	30	18.4	24	1.74	42	23.6	29	27.50	32	21.7
20.8	16.96	35	65.3	23	51.04	32	16.3	21	2.20	46	21.2	24	27.83	33	23.1
30.8	17.32	36	63.4	19	51.36	32	14.4	19	2.69	49	19.4	18	28.18	35	24.5
Feb. 9.8	17.68	36	62.0	14	51.69	33	12.9	15	3.19	50	18.3	11	28.52	34	25.9
19.7	18.04	36	61.2	8	52.01	32	11.8	11	3.69	50	17.8	5	28.85	33	27.3
Mar. 1.7	18.38	34	61.0	2	52.31	30	11.1	7	4.17	48	18.0	2	29.16	31	28.5
11.7	18.70	32	61.4	4	52.59	28	10.9	2	4.62	45	18.8	8	29.46	30	29.6
21.6	18.99	29	62.3	9	52.85	26	11.1	2	5.02	40	20.3	15	29.73	27	30.5
31.6	19.25	26	63.7	14	53.08	23	11.7	6	5.37	35	22.3	20	29.98	25	31.3
Apr. 10.6	19.47	22	65.5	18	53.29	21	12.6	9	5.66	29	24.7	24	30.20	22	31.9
20.6	19.65	18	67.7	22	53.46	17	13.9	13	5.89	23	27.4	27	30.40	20	32.4
30.5	19.79	14	70.1	24	53.60	14	15.3	14	6.04	15	30.4	30	30.56	16	32.7
May 10.5	19.89	10	72.7	26	53.72	12	16.9	16	6.13	9	33.5	31	30.70	14	32.9
20.5	19.94	5	75.3	26	53.80	8	18.6	17	6.15	2	36.7	32	30.81	11	33.0
30.5	19.96	2	77.9	26	53.85	5	20.4	18	6.10	5	39.7	30	30.89	8	33.0
June 9.4	19.94	2	80.4	25	53.87	2	22.1	17	5.99	11	42.5	28	30.93	4	32.9
19.4	19.88	6	82.6	22	53.86	1	23.7	16	5.82	17	45.1	26	30.94	1	32.8
29.4	19.79	9	84.7	21	53.81	5	25.2	15	5.60	22	47.4	23	30.93	1	32.6
July 9.3	19.66	13	86.4	17	53.74	7	26.5	13	5.33	27	49.2	18	30.88	5	32.3
19.3	19.51	15	87.8	14	53.65	9	27.6	11	5.01	32	50.6	14	30.80	8	32.0
29.3	19.33	18	88.8	10	53.53	12	28.4	8	4.67	34	51.5	9	30.70	10	31.7
Aug. 8.3	19.13	20	89.3	5	53.39	14	29.0	6	4.30	37	51.9	4	30.58	12	31.3
18.2	18.92	21	89.5	2	53.24	15	29.4	4	3.91	39	51.8	1	30.44	14	30.9
28.2	18.71	21	89.3	2	53.09	15	29.5	1	3.52	39	51.2	6	30.30	14	30.4
Sept. 7.2	18.49	22	88.6	7	52.93	16	29.3	2	3.14	38	50.1	11	30.16	14	30.0
17.2	18.29	20	87.5	11	52.78	15	28.8	5	2.78	36	48.5	16	30.02	14	29.6
27.1	18.10	19	85.9	16	52.65	13	28.0	8	2.44	34	46.5	20	29.90	12	29.1
Oct. 7.1	17.95	15	84.0	19	52.54	11	26.9	11	2.15	29	44.0	25	29.80	10	28.8
17.1	17.84	11	81.7	23	52.47	7	25.6	13	1.92	23	41.1	29	29.75	5	28.6
27.0	17.77	7	79.1	26	52.44	3	23.9	17	1.75	17	37.9	32	29.74	1	28.5
Nov. 6.0	17.75	2	76.2	29	52.45	1	22.0	19	1.65	10	34.4	35	29.77	3	28.5
16.0	17.78	3	73.1	31	52.52	7	19.9	21	1.63	2	30.8	36	29.85	8	28.7
26.0	17.88	10	69.8	33	52.63	11	17.5	24	1.70	7	27.0	38	29.99	14	29.2
Dec. 5.9	18.04	16	66.5	33	52.79	16	15.1	24	1.86	16	23.3	37	30.18	19	29.9
15.9	18.25	21	63.2	33	53.00	21	12.5	26	2.09	23	19.6	37	30.41	23	30.8
25.9	18.51	26	60.0	32	53.25	25	10.0	25	2.40	31	16.2	34	30.69	28	31.9
35.9	18.81	30	57.0	30	53.53	28	7.5	25	2.78	38	13.1	31	30.99	30	33.1
Sec δ, Tan δ	1.263		+0.772		1.039		+0.281		1.956		+1.681		1.043		−0.29
Mean Place	$16^s.763$		$88''.94$		$50^s.763$		$34''.32$		$2^s.326$		$48''.31$		$27^s.596$		$15''.31$
$D'_\psi \alpha$, $D_\omega \alpha$	−0.02		+0.03		−0.01		+0.01		−0.03		+0.07		+0.01		−0.01
$D_\omega \delta$	−0.3		−0.8		−0.3		−0.8		−0.3		−0.8		−0.3		−0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	ρ Octantis. Mag. 5.7 Right Ascension.		ρ Octantis. Declination S.		β Coronæ Borealis. Mag. 3.7 Right Ascension.		β Coronæ Borealis. Declination N.		ν¹ Boötis. Mag. 5.2 Right Ascension.		ν¹ Boötis. Declination N.		γ Lupi (*mean*). Mag. 3.0 Right Ascension.		γ Lupi (*mean*). Declination S.	
	h m 15 23		° ′ −84 10		h m 15 24		° ′ +29 23		h m 15 27		° ′ +41 6		h m 15 29		° ′ −40 52	
	s		″		s		″		s		″		s		″	
n. 0.9	20.35		58.2		19.06		36.4		52.00		61.1		27.49		54.8	
10.8	22.66	231	57.0	12	19.37	31	33.8	26	52.33	33	58.3	28	27.88	39	55.1	3
20.8	25.13	247	56.3	7	19.69	32	31.4	24	52.68	35	55.8	25	28.29	41	55.7	6
30.8	27.71	258	56.2	1	20.04	35	29.5	19	53.05	37	53.9	19	28.71	42	56.5	8
b. 9.8	30.32	261	56.6	4	20.38	34	28.0	15	53.43	38	52.5	14	29.13	42	57.6	11
19.7	32.91	259	57.6	10	20.71	33	27.1	9	53.80	37	51.7	8	29.54	41	58.9	13
ar. 1.7	35.42	251	59.0	14	21.04	33	26.7	4	54.15	35	51.5	2	29.93	39	60.3	14
11.7	37.79	237	60.9	19	21.34	30	26.8	1	54.49	34	51.9	4	30.31	38	61.8	15
21.6	39.98	219	63.2	23	21.61	27	27.5	7	54.79	30	52.8	9	30.65	34	63.4	16
31.6	41.96	198	65.9	27	21.86	25	28.6	11	55.06	27	54.3	15	30.97	32	65.1	17
or. 10.6	43.69	173	68.8	29	22.07	21	30.1	15	55.30	24	56.3	20	31.25	28	66.8	17
20.6	45.14	145	71.9	31	22.25	18	32.0	19	55.49	19	58.5	22	31.50	25	68.4	16
30.5	46.29	115	75.2	33	22.39	14	34.1	21	55.64	15	61.1	26	31.72	22	70.0	16
ay 10.5	47.11	82	78.5	33	22.49	10	36.3	22	55.74	10	63.8	27	31.90	18	71.6	16
20.5	47.60	49	81.8	33	22.56	7	38.6	23	55.80	6	66.5	27	32.03	13	73.2	16
30.5	47.74	14	85.1	33	22.60	4	41.0	24	55.82	2	69.2	27	32.13	10	74.6	14
ıne 9.4	47.54	20	88.2	31	22.60	0	43.2	22	55.80	2	71.8	26	32.19	6	75.8	12
19.4	47.01	53	91.2	30	22.57	3	45.3	21	55.74	6	74.2	24	32.21	2	77.0	12
29.4	46.16	85	93.8	26	22.50	7	47.2	19	55.64	10	76.4	22	32.18	3	77.9	9
ıly 9.3	45.02	114	96.0	22	22.40	10	48.8	16	55.50	14	78.2	18	32.11	7	78.7	8
19.3	43.62	140	97.8	18	22.28	12	50.1	13	55.33	17	79.6	14	32.01	10	79.2	5
29.3	42.01	161	99.2	14	22.13	15	51.1	10	55.14	19	80.7	11	31.87	14	79.5	3
ug. 8.3	40.25	176	100.0	8	21.96	17	51.7	6	54.93	21	81.3	6	31.70	17	79.6	1
18.2	38.40	185	100.3	3	21.78	18	52.0	3	54.70	23	81.5	2	31.52	18	79.3	3
28.2	36.52	188	100.0	3	21.59	19	51.9	1	54.46	24	81.2	3	31.32	20	78.8	5
ept. 7.2	34.69	183	99.1	9	21.40	19	51.4	5	54.23	23	80.6	6	31.13	19	78.1	7
17.2	32.98	171	97.7	14	21.23	17	50.6	8	54.01	22	79.4	12	30.94	19	77.1	10
27.1	31.47	151	95.8	19	21.07	16	49.3	13	53.80	21	77.8	16	30.78	16	76.0	11
ct. 7.1	30.23	124	93.4	24	20.93	14	47.7	16	53.63	17	75.9	19	30.65	13	74.7	13
17.1	29.32	91	90.8	26	20.84	9	45.8	19	53.50	13	73.5	24	30.57	8	73.3	14
27.0	28.79	53	87.8	30	20.78	6	43.5	23	53.41	9	70.8	27	30.54	3	71.9	14
lov. 6.0	28.67	12	84.8	30	20.77	1	40.9	26	53.37	4	67.8	30	30.57	3	70.5	14
16.0	28.98	31	81.6	32	20.82	5	38.1	28	53.40	3	64.6	32	30.67	10	69.3	12
26.0	29.73	75	78.6	30	20.92	10	35.2	29	53.48	8	61.2	34	30.83	16	68.2	11
ec. 5.9	30.90	117	75.9	27	21.08	16	32.2	30	53.63	15	57.8	34	31.06	23	67.4	8
15.9	32.45	155	73.4	25	21.28	20	29.1	31	53.83	20	54.4	34	31.34	28	66.8	6
25.9	34.33	188	71.4	20	21.53	25	26.1	30	54.09	26	51.1	33	31.67	33	66.6	2
35.9	36.49	216	69.8	16	21.81	28	23.3	28	54.39	30	48.1	30	32.04	37	66.6	0
c δ, Tan δ	9.876		−9.825		1.148		+0.563		1.327		+0.873		1.323		−0.866	
an Place	29ˢ.89*		65″.28		19ˢ.475		53″.12		52ˢ.571		80″.07		28ˢ.255		55″.46	
ψα, Dω α	+0.20		−0.41		−0.01		+0.02		−0.02		+0.04		+0.02		−0.04	
ψδ, Dω δ	−0.3		−0.8		−0.3		−0.8		−0.2		−0.8		−0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*γ* Libræ. Mag. 4.0				*α* Coronæ Borealis. Mag. 2.3				*ζ* Cor. Bor. *seq.* Mag. 5.1				*α* Serpentis. Mag. 2.8		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.
	h m 15 30		° ′ −14 30		h m 15 31		° ′ +26 59		h m 15 36		° ′ +36 54		h m 15 40		° + 6 4
	s		″		s		″		s		″		s		″
Jan. 0.9	45.72		29.7		4.87		44.2		10.06		22.4		4.38		21.2
10.8	46.03	31	31.1	14	5.17	30	41.5	27	10.37	31	19.5	29	4.67	29	19.1
20.8	46.36	33	32.5	14	5.49	32	39.2	23	10.71	34	17.0	25	4.98	31	17.1
30.8	46.70	34	34.0	15	5.83	34	37.3	19	11.06	35	15.0	20	5.30	32	15.3
Feb. 9.8	47.04	34	35.4	14	6.17	34	35.7	16	11.42	36	13.5	15	5.62	32	13.8
19.7	47.36	32	36.6	12	6.50	33	34.7	10	11.78	36	12.6	9	5.93	31	12.6
Mar. 1.7	47.68	32	37.8	12	6.82	32	34.2	5	12.12	34	12.3	3	6.24	31	11.8
11.7	47.98	30	38.8	10	7.12	30	34.3	1	12.44	32	12.5	2	6.53	29	11.3
21.7	48.25	27	39.6	8	7.39	27	34.8	5	12.74	30	13.3	8	6.79	26	11.2
31.6	48.50	25	40.3	7	7.64	25	35.8	10	13.01	27	14.6	13	7.03	24	11.4
Apr. 10.6	48.73	23	40.8	5	7.86	22	37.2	14	13.24	23	16.4	18	7.25	22	11.9
20.6	48.93	20	41.1	3	8.04	18	39.0	18	13.44	20	18.5	21	7.45	20	12.7
30.5	49.10	17	41.3	2	8.19	15	41.0	20	13.59	15	20.9	24	7.61	16	13.7
May 10.5	49.24	14	41.3	0	8.31	12	43.1	21	13.71	12	23.5	26	7.74	13	14.9
20.5	49.36	12	41.3	0	8.39	8	45.4	23	13.79	8	26.1	26	7.85	11	16.2
30.5	49.44	8	41.2	1	8.43	4	47.6	22	13.82	3	28.7	26	7.92	7	17.6
June 9.4	49.49	5	41.0	2	8.44	1	49.8	22	13.82	0	31.3	26	7.97	5	18.9
19.4	49.51	2	40.7	3	8.42	2	51.8	20	13.78	4	33.6	23	7.98	1	20.2
29.4	49.50	1	40.4	3	8.37	5	53.7	19	13.70	8	35.7	21	7.97	1	21.5
July 9.4	49.46	4	40.1	3	8.28	9	55.3	16	13.58	12	37.6	19	7.92	5	22.6
19.3	49.39	7	39.8	3	8.17	11	56.7	14	13.44	14	39.1	15	7.84	8	23.6
29.3	49.29	10	39.4	4	8.03	14	57.7	10	13.27	17	40.2	11	7.74	10	24.4
Aug. 8.3	49.17	12	39.0	4	7.87	16	58.4	7	13.08	19	41.0	8	7.62	12	25.0
18.2	49.03	14	38.6	4	7.70	17	58.8	4	12.87	21	41.3	3	7.48	14	25.5
28.2	48.89	14	38.2	4	7.51	19	58.7	1	12.65	22	41.2	1	7.33	15	25.8
Sept. 7.2	48.74	15	37.8	4	7.33	18	58.4	3	12.43	22	40.7	5	7.18	15	25.8
17.2	48.60	14	37.4	4	7.16	17	57.6	8	12.22	21	39.7	10	7.03	15	25.7
27.1	48.48	12	37.1	3	7.00	16	56.5	11	12.03	19	38.3	14	6.90	13	25.3
Oct. 7.1	48.38	10	36.8	3	6.86	14	55.0	15	11.86	17	36.5	18	6.79	11	24.7
17.1	48.32	6	36.7	1	6.76	10	53.2	18	11.73	13	34.4	21	6.71	8	23.8
27.1	48.30	2	36.7	0	6.71	5	51.1	21	11.65	8	31.9	25	6.67	4	22.6
Nov. 6.0	48.32	2	36.9	2	6.70	1	48.6	25	11.61	4	29.1	28	6.68	1	21.3
16.0	48.40	8	37.2	3	6.74	4	45.9	27	11.63	2	26.1	30	6.73	5	19.7
26.0	48.53	13	37.7	5	6.83	9	43.1	28	11.71	8	22.9	32	6.83	10	17.9
Dec. 5.9	48.71	18	38.5	8	6.98	15	40.2	29	11.85	14	19.6	33	6.98	15	15.9
15.9	48.93	22	39.5	10	7.18	20	37.2	30	12.04	19	16.3	33	7.18	20	13.8
25.9	49.20	27	40.6	11	7.42	24	34.3	29	12.28	24	13.1	32	7.42	24	11.7
35.9	49.50	30	41.9	13	7.70	28	31.5	28	12.57	29	10.1	30	7.69	27	9.6
Sec *δ*, Tan *δ*	1.033		−0.259		1.122		+0.509		1.251		+0.751		1.007		+0.117
Mean Place	46ˢ.151		24″.03		5ˢ.313		60″.25		10ˢ.632		40″.29		4ˢ.796		32″.38
$D'_\psi \alpha$, $D_\omega \alpha$	+0.01		−0.01		−0.01		+0.02		−0.02		+0.03		0.00		0.00
$D_\psi \delta$, $D_\omega \delta$	−0.2		−0.8		−0.2		−0.8		−0.2		−0.8		−0.2		−0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Serpentis. Mag. 3.7				κ Serpentis. Mag. 4.3				μ Serpentis. Mag. 3.6				12 H. Draconis. Mag. 5.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 42		+15 40		15 44		+18 23		15 45		− 3 10		15 45		+62 51	
	s		″		s		″		s		″		s		″	
Jan. 0.9	15.44		60.1		54.30		58.0		10.51		23.8		20.56		21.9	
10.9	15.72	28	57.7	24	54.58	28	55.5	25	10.80	29	25.6	18	20.98	42	18.9	30
20.8	16.03	31	55.5	22	54.89	31	53.2	23	11.11	31	27.3	17	21.45	47	16.3	26
30.8	16.35	32	53.6	19	55.21	32	51.3	19	11.43	32	28.9	16	21.96	51	14.3	20
Feb. 9.8	16.67	32	52.1	15	55.54	33	49.7	16	11.75	32	30.3	14	22.50	54	13.0	13
		32		12		32		11		32		12		55		7
19.7	16.99		50.9		55.86		48.6		12.07		31.5		23.05		12.3	
Mar. 1.7	17.30	31	50.2	7	56.17	31	47.9	7	12.38	31	32.5	10	23.59	54	12.3	0
11.7	17.59	29	49.9	3	56.46	29	47.7	2	12.67	29	33.2	7	24.09	50	12.9	6
21.7	17.86	27	50.1	2	56.73	27	47.9	2	12.94	27	33.7	5	24.56	47	14.2	13
31.6	18.10	24	50.7	6	56.98	25	48.5	6	13.19	25	33.8	1	24.98	42	16.1	19
		22		9		22		11		23		1		35		23
Apr. 10.6	18.32		51.6		57.20		49.6		13.42		33.7		25.33		18.4	
20.6	18.52	20	52.8	12	57.40	20	50.9	13	13.62	20	33.4	3	25.61	28	21.1	27
30.6	18.68	16	54.3	15	57.56	16	52.5	16	13.79	17	32.9	5	25.82	21	24.1	30
May 10.5	18.81	13	56.0	17	57.69	13	54.3	18	13.94	15	32.3	6	25.94	12	27.3	32
20.5	18.91	10	57.7	17	57.79	10	56.2	19	14.06	12	31.5	8	25.99	5	30.5	32
		7		18		7		20		8		8		3		31
30.5	18.98		59.5		57.86		58.2		14.14		30.7		25.96		33.6	
June 9.4	19.02	4	61.3	18	57.90	4	60.1	19	14.20	6	29.8	9	25.86	10	36.6	30
19.4	19.02	0	63.0	17	57.90	0	61.9	18	14.23	3	29.0	8	25.69	17	39.4	28
29.4	19.00	2	64.6	16	57.87	3	63.6	17	14.22	1	28.2	8	25.45	24	41.9	25
July 9.4	18.94	6	66.0	14	57.81	6	65.1	15	14.18	4	27.4	8	25.15	30	44.0	21
		9		12		9		13		6		7		35		16
19.3	18.85		67.2		57.72		66.4		14.12		26.7		24.80		45.6	
29.3	18.74	11	68.2	10	57.61	11	67.4	10	14.03	9	26.0	7	24.41	39	46.8	12
Aug. 8.3	18.61	13	68.9	7	57.47	14	68.2	8	13.91	12	25.5	5	23.99	42	47.5	7
18.2	18.46	15	69.4	5	57.32	15	68.6	4	13.78	13	25.0	5	23.54	45	47.7	2
28.2	18.30	16	69.6	2	57.15	17	68.8	2	13.63	15	24.7	3	23.08	46	47.4	3
		17		1		17		1		15		2		46		9
Sept. 7.2	18.13		69.5		56.98		68.7		13.48		24.5		22.62		46.5	
17.2	17.97	16	69.1	4	56.82	16	68.3	4	13.34	14	24.4	1	22.18	44	45.1	14
27.1	17.83	14	68.4	7	56.67	15	67.5	8	13.21	13	24.5	1	21.77	41	43.3	18
Oct. 7.1	17.71	12	67.4	10	56.54	13	66.4	11	13.10	11	24.7	2	21.40	37	41.0	23
17.1	17.62	9	66.1	13	56.44	10	65.0	14	13.02	8	25.1	4	21.08	32	38.3	27
		5		15		6		17		4		6		25		31
27.1	17.57		64.6		56.38		63.3		12.98		25.7		20.83		35.2	
Nov. 6.0	17.56	1	62.8	18	56.37	1	61.4	19	12.99	1	26.5	8	20.66	17	31.8	34
16.0	17.60	4	60.7	21	56.41	4	59.2	22	13.04	5	27.5	10	20.58	8	28.2	36
26.0	17.69	9	58.4	23	56.50	9	56.8	24	13.15	11	28.7	12	20.59	1	24.5	37
Dec. 5.9	17.84	15	56.0	24	56.63	13	54.2	26	13.30	15	30.1	14	20.70	11	20.7	38
		19		25		19		26		20		15		20		37
15.9	18.03		53.5		56.82		51.6		13.50		31.6		20.90		17.0	
25.9	18.26	23	50.9	26	57.05	23	49.0	26	13.74	24	33.3	17	21.19	29	13.4	36
35.9	18.53	27	48.5	24	57.31	26	46.4	26	14.02	28	35.0	17	21.56	37	10.2	32
Sec δ, Tan δ	1.039		+0.281		1.054		+0.333		1.002		−0.055		2.192		+1.951	
Mean Place	$15^{s}.876$		$73''.45$		$54^{s}.765$		$71''.83$		$10^{s}.949$		$15''.08$		$22^{s}.054$		$43''.02$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.01		+0.01		−0.01		+0.01		0.00		0.00		−0.04		+0.07	
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.2		−0.8		−0.2		−0.8		−0.2		−0.8		−0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Serpentis. Mag. 3.8				ζ Ursæ Minoris. Mag. 4.3				β Triang. Aust. Mag. 3.0				λ Libræ. Mag. 5.1		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.
	h m 15 46		° ′ + 4 43		h m 15 46		° ′ +78 2		h m 15 47		° ′ −63 10		h m 15 48		° −19
	s		″		s		″		s		″		s		″
Jan. 0.9	34.21		48.0		60.11		61.4		36.70		6.7		23.26		55.0
10.9	34.49	28	46.0	20	60.86	75	58.6	28	37.27	57	5.9	8	23.57	31	56.0
20.8	34.80	31	44.1	19	61.75	89	56.2	24	37.89	62	5.5	4	23.90	33	57.1
30.8	35.11	31	42.4	17	62.74	99	54.4	18	38.53	64	5.5	0	24.25	35	58.3
Feb. 9.8	35.43	32	40.9	15	63.80	106	53.2	12	39.18	65	6.0	5	24.59	34	59.5
19.7	35.75	32	39.7	12	64.89	109	52.7	5	39.83	65	6.8	8	24.93	34	60.7
Mar. 1.7	36.06	31	38.8	9	65.98	109	52.9	2	40.46	63	8.0	12	25.26	33	61.8
11.7	36.35	29	38.3	5	67.01	103	53.7	8	41.07	61	9.5	15	25.58	32	62.9
21.7	36.62	27	38.1	2	67.95	94	55.1	14	41.64	57	11.3	18	25.87	29	63.8
31.6	36.86	24	38.2	1	68.78	83	57.1	20	42.17	53	13.4	21	26.14	27	64.5
Apr. 10.6	37.09	23	38.7	5	69.46	68	59.6	25	42.64	47	15.7	23	26.39	25	65.2
20.6	37.29	20	39.4	7	69.98	52	62.4	28	43.06	42	18.1	24	26.61	22	65.7
30.6	37.46	17	40.3	9	70.33	35	65.5	31	43.42	36	20.6	25	26.81	20	66.1
May 10.5	37.60	14	41.4	11	70.49	16	68.7	32	43.72	30	23.1	25	26.97	16	66.4
20.5	37.71	11	42.6	12	70.47	2	71.9	32	43.95	23	25.7	26	27.11	14	66.6
30.5	37.79	8	43.9	13	70.27	20	75.1	32	44.10	15	28.2	25	27.21	10	66.8
June 9.4	37.85	6	45.2	13	69.90	37	78.0	29	44.18	8	30.6	24	27.28	7	66.9
19.4	37.87	2	46.4	12	69.37	53	80.7	27	44.19	1	32.9	23	27.32	4	66.9
29.4	37.86	1	47.6	12	68.69	68	83.1	24	44.12	7	34.9	20	27.32	0	66.9
July 9.4	37.81	5	48.7	11	67.89	80	85.1	20	43.98	14	36.7	18	27.29	3	66.8
19.3	37.74	7	49.6	9	66.97	92	86.6	15	43.78	20	38.1	14	27.23	6	66.7
29.3	37.65	9	50.4	8	65.97	100	87.6	10	43.51	27	39.2	11	27.13	10	66.5
Aug. 8.3	37.53	12	51.1	7	64.91	106	88.2	6	43.20	31	39.9	7	27.01	12	66.2
18.3	37.39	14	51.6	5	63.81	110	88.2	0	42.85	35	40.1	2	26.88	13	65.9
28.2	37.24	15	51.9	3	62.69	112	87.7	5	42.48	37	39.9	2	26.73	15	65.5
Sept. 7.2	37.09	15	52.0	1	61.59	110	86.6	11	42.11	37	39.3	6	26.57	16	65.1
17.2	36.94	15	51.9	1	60.52	107	85.1	15	41.75	36	38.2	11	26.42	15	64.6
27.1	36.81	13	51.6	3	59.51	101	83.1	20	41.42	33	36.8	14	26.28	14	64.1
Oct. 7.1	36.69	12	51.0	6	58.59	92	80.7	24	41.15	27	35.0	18	26.17	11	63.7
17.1	36.61	8	50.3	7	57.79	80	77.9	28	40.95	20	32.9	21	26.09	8	63.3
27.1	36.57	4	49.3	10	57.13	66	74.7	32	40.84	11	30.6	23	26.05	4	63.0
Nov. 6.0	36.57	0	48.0	13	56.63	50	71.3	34	40.82	2	28.2	24	26.06	1	62.8
16.0	36.62	5	46.6	14	56.31	32	67.6	37	40.90	8	25.9	23	26.13	7	62.8
26.0	36.71	9	44.9	17	56.18	13	63.9	37	41.09	19	23.6	23	26.24	11	63.0
Dec. 6.0	36.86	15	43.1	18	56.26	8	60.2	37	41.38	29	21.5	21	26.41	17	63.3
15.9	37.05	19	41.1	20	56.53	27	56.5	37	41.76	38	19.6	19	26.63	22	63.9
25.9	37.29	24	39.1	20	57.00	47	53.1	34	42.23	47	18.1	15	26.89	26	64.6
35.9	37.55	26	37.0	21	57.64	64	50.0	31	42.76	53	17.0	11	27.18	29	65.6
Sec δ, Tan δ	1.003		+0.083		4.831		+4.726		2.216		−1.977		1.064		−0.362
Mean Place	34ˢ.648		58″.75		64ˢ.094		83″.35		38ˢ.490		10″.23		23ˢ.796		50″.15
D′ψ α, Dω α	0.00		0.00		−0.10		+0.17		+0.04		−0.07		+0.01		−0.01
Dψ δ, Dω δ	−0.2		−0.8		−0.2		−0.8		−0.2		−0.8		−0.2		−0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

n Solar ate.	γ Serpentis. Mag. 3.9				π Scorpii. Mag. 3.0				ε Coronæ Borealis. Mag. 4.2				δ Scorpii. Mag. 2.5			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	15 52		+15 55		15 53		−25 52		15 54		+27 6		15 55		−22 22	
	s		″		s		″		s		″		s		″	
ı. 0.9	31.08	28	64.8	25	41.78	33	16.6	8	3.47	28	68.5	27	17.67	31	54.8	9
10.9	31.36	30	62.3	22	42.11	34	17.4	8	3.75	31	65.8	25	17.98	33	55.7	10
20.8	31.66	31	60.1	20	42.45	36	18.2	10	4.06	32	63.3	20	18.31	35	56.7	11
30.8	31.97	32	58.1	16	42.81	36	19.2	11	4.38	34	61.3	17	18.66	35	57.8	11
ɔ. 9.8	32.29	32	56.5	12	43.17	35	20.3	11	4.72	33	59.6	11	19.01	35	58.9	11
19.7	32.61	31	55.3	8	43.52	35	21.4	11	5.05	32	58.5	6	19.36	33	60.0	11
r. 1.7	32.92	30	54.5	3	43.87	33	22.5	11	5.37	31	57.9	1	19.69	32	61.1	10
11.7	33.22	27	54.2	1	44.20	31	23.6	10	5.68	29	57.8	5	20.01	31	62.1	9
21.7	33.49	26	54.3	5	44.51	28	24.6	10	5.97	26	58.3	9	20.32	28	63.0	8
31.6	33.75	23	54.8	9	44.79	27	25.6	9	6.23	24	59.2	13	20.60	26	63.8	8
'r. 10.6	33.98	20	55.7	12	45.06	23	26.5	8	6.47	20	60.5	17	20.86	23	64.6	6
20.6	34.18	17	56.9	15	45.29	21	27.3	7	6.67	17	62.2	20	21.09	20	65.2	5
30.6	34.35	14	58.4	16	45.50	18	28.0	6	6.84	14	64.2	22	21.29	18	65.7	4
ıy 10.5	34.49	11	60.0	18	45.68	15	28.6	5	6.98	11	66.4	23	21.47	15	66.1	3
20.5	34.60	8	61.8	18	45.83	11	29.1	5	7.09	7	68.7	24	21.62	11	66.4	3
30.5	34.68	5	63.6	18	45.94	8	29.6	4	7.16	3	71.1	23	21.73	8	66.7	3
ne 9.4	34.73	1	65.4	17	46.02	5	30.0	4	7.19	0	73.4	22	21.81	4	67.0	1
19.4	34.74	2	67.1	16	46.07	0	30.4	3	7.19	4	75.6	20	21.85	1	67.1	1
29.4	34.72	5	68.7	15	46.07	3	30.7	2	7.15	8	77.6	18	21.86	3	67.2	0
ly 9.4	34.67	8	70.2	12	46.04	6	30.9	1	7.07	10	79.4	15	21.83	6	67.2	0
19.3	34.59	11	71.4	10	45.98	10	31.0	0	6.97	13	80.9	12	21.77	9	67.2	1
29.3	34.48	13	72.4	8	45.88	12	31.0	2	6.84	16	82.1	9	21.68	12	67.1	2
ıg. 8.3	34.35	15	73.2	5	45.76	14	30.8	2	6.68	17	83.0	5	21.56	14	66.9	3
18.3	34.20	16	73.7	2	45.62	16	30.6	4	6.51	19	83.5	2	21.42	16	66.6	4
28.2	34.04	17	73.9	1	45.46	17	30.2	4	6.32	19	83.7	2	21.26	16	66.2	4
pt. 7.2	33.87	16	73.8	3	45.29	16	29.8	6	6.13	19	83.5	6	21.10	15	65.8	5
17.2	33.71	15	73.5	7	45.13	15	29.2	6	5.94	18	82.9	9	20.95	14	65.3	5
27.1	33.56	13	72.8	10	44.98	12	28.6	7	5.76	15	82.0	13	20.81	12	64.8	5
t. 7.1	33.43	10	71.8	13	44.86	8	27.9	6	5.61	12	80.7	17	20.69	8	64.3	5
17.1	33.33	6	70.5	15	44.78	5	27.3	6	5.49	8	79.0	20	20.61	5	63.8	4
27.1	33.27	1	69.0	19	44.73	1	26.7	6	5.41	3	77.0	23	20.56	0	63.4	3
ov. 6.0	33.26	3	67.1	21	44.74	6	26.1	4	5.38	1	74.7	26	20.56	6	63.1	2
16.0	33.29	8	65.0	23	44.80	12	25.7	2	5.39	7	72.1	28	20.62	11	62.9	0
26.0	33.37	13	62.7	24	44.92	17	25.5	0	5.46	12	69.3	29	20.73	17	62.9	1
ec. 6.0	33.50	18	60.3	25	45.09	22	25.5	2	5.58	17	66.4	30	20.90	21	63.0	4
15.9	33.68	23	57.8	26	45.31	26	25.7	3	5.75	22	63.4	29	21.11	26	63.4	6
25.9	33.91	26	55.2	25	45.57	31	26.0	6	5.97	26	60.5	28	21.37	29	64.0	8
35.9	34.17		52.7		45.88		26.6		6.23		57.7		21.66		64.8	
δ, Tan δ	1.040		+0.286		1.111		−0.485		1.124		+0.512		1.081		−0.412	
n Place	31ˢ.567		77″.98		42ˢ.394		13″.02		4ˢ.044		83″.97		18ˢ.247		50″.38	
a, $D_\omega \alpha$	−0.01		+0.01		+0.01		−0.02		−0.01		+0.02		+0.01		−0.01	
δ. $D_\omega \delta$	−0.2		−0.8		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**θ Draconis.** Mag. 4.1				**β Scorpii.** Mag. 2.9				**κ Herculis.** Mag. 5.3				**Groombridge 2** Mag. 5.4		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Decl- tio
	h m 16 0		° ′ +58 47		h m 16 0		° ′ −19 34		h m 16 4		° ′ +17 15		h m 16 6		+6
	s		″		s		″		s		″		s		″
Jan. 0.9	16.31	36	11.2	32	28.90	30	30.2	10	13.67	27	67.6	25	2.90	43	41.
10.9	16.67	41	8.0	27	29.20	33	31.2	10	13.94	30	65.1	22	3.33	51	38.
20.8	17.08	46	5.3	21	29.53	34	32.2	11	14.24	31	62.9	20	3.84	57	35.
30.8	17.54	48	3.2	16	29.87	34	33.3	12	14.55	32	60.9	16	4.41	62	33.
Feb. 9.8	18.02	48	1.6	9	30.21	34	34.5	11	14.87	32	59.3	12	5.03	64	32.
19.8	18.50	49	0.7	2	30.55	33	35.6	10	15.19	31	58.1	8	5.67	64	31.
Mar. 1.7	18.99	46	0.5	4	30.88	32	36.6	10	15.50	30	57.3	3	6.31	61	31.
11.7	19.45	43	0.9	11	31.20	30	37.6	8	15.80	28	57.0	2	6.92	58	31.
21.7	19.88	39	2.0	17	31.50	28	38.4	7	16.08	26	57.2	6	7.50	52	32.
31.6	20.27	34	3.7	22	31.78	26	39.1	5	16.34	24	57.8	10	8.02	45	34.
Apr. 10.6	20.61	28	5.9	26	32.04	23	39.6	5	16.58	21	58.8	13	8.47	36	36.
20.6	20.89	22	8.5	29	32.27	21	40.1	3	16.79	18	60.1	15	8.83	28	39.
30.6	21.11	15	11.4	31	32.48	17	40.4	2	16.97	15	61.6	18	9.11	18	42.
May 10.5	21.26	8	14.5	32	32.65	15	40.6	2	17.12	12	63.4	19	9.29	8	45.
20.5	21.34	2	17.7	32	32.80	12	40.8	1	17.24	9	65.3	19	9.37	1	48.
30.5	21.36	5	20.9	31	32.92	8	40.9	0	17.33	6	67.2	20	9.36	11	52.
June 9.5	21.31	12	24.0	28	33.00	4	40.9	0	17.39	2	69.2	18	9.25	20	55.
19.4	21.19	17	26.8	26	33.04	2	40.9	0	17.41	2	71.0	18	9.05	28	58.
29.4	21.02	24	29.4	23	33.06	3	40.9	1	17.39	4	72.8	16	8.77	36	60.
July 9.4	20.78	28	31.7	19	33.03	5	40.8	2	17.35	8	74.4	13	8.41	43	63.
19.3	20.50	32	33.6	14	32.98	9	40.6	2	17.27	11	75.7	12	7.98	49	65.
29.3	20.18	36	35.0	10	32.89	12	40.4	2	17.16	13	76.9	9	7.49	53	66.
Aug. 8.3	19.82	38	36.0	4	32.77	13	40.2	3	17.03	15	77.8	6	6.96	57	67.
18.3	19.44	40	36.4	1	32.64	15	39.9	3	16.88	17	78.4	3	6.39	59	67.
28.2	19.04	40	36.3	5	32.49	16	39.6	4	16.71	17	78.7	0	5.80	59	67.
Sept. 7.2	18.64	40	35.8	11	32.33	16	39.2	4	16.54	17	78.7	3	5.21	58	67.
17.2	18.24	37	34.7	16	32.17	14	38.8	4	16.37	16	78.4	6	4.63	55	66.
27.2	17.87	34	33.1	20	32.03	12	38.4	4	16.21	14	77.8	10	4.08	51	64.
Oct. 7.1	17.53	29	31.1	25	31.91	9	38.0	4	16.07	11	76.8	12	3.57	45	62.
17.1	17.24	23	28.6	29	31.82	4	37.6	3	15.96	7	75.6	16	3.12	37	59.7
27.1	17.01	17	25.7	32	31.78	0	37.3	2	15.89	3	74.0	18	2.75	28	56.8
Nov. 6.0	16.84	9	22.5	35	31.78	5	37.1	0	15.86	2	72.2	20	2.47	18	53.5
16.0	16.75	0	19.0	36	31.83	10	37.1	2	15.88	6	70.2	23	2.29	7	50.
26.0	16.75	8	15.4	37	31.93	15	37.3	3	15.94	12	67.9	25	2.22	4	46.3
Dec. 6.0	16.83	16	11.7	37	32.08	21	37.6	5	16.06	17	65.4	25	2.26	16	42.5
15.9	16.99	25	8.0	36	32.29	25	38.1	7	16.23	21	62.9	26	2.42	27	38.8
25.9	17.24	31	4.4	33	32.54	28	38.8	9	16.44	25	60.3	25	2.69	37	35.2
35.9	17.55		1.1		32.82		39.7		16.69		57.8		3.06		31.9
Sec δ, Tan δ	1.930		+1.650		1.061		−0.356		1.047		+0.311		2.673		+2.4
Mean Place	17ˢ.734		31″.11		29ˢ.473		24″.98		14ˢ.227		80″.89		5ˢ.165		62″.0
D′ψ a, Dω a	−0.04		+0.06		+0.01		−0.01		−0.01		+0.01		−0.06		+0.0
Dψ δ, Dω δ	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9

an Solar Date.	**φ Herculis.** Mag. 4.3				**δ^1 Apodis.** Mag. 4.8				**δ Ophiuchi.** Mag. 3.0				**σ Cor. Bor.** *seq.* Mag. 5.8			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 16 6		° ′ +45 8		h m 16 7		° ′ −78 28		h m 16 9		° ′ − 3 28		h m 16 11		° ′ +34 3	
	s		″		s		″		s		″		s		″	
n. 0.9	4.54		68.1		31.07		57.8		52.84		43.3		28.94		68.6	
10.9	4.84	30	65.0	31	32.19	112	56.1	17	53.12	28	44.9	16	29.21	27	65.7	29
20.8	5.17	33	62.3	27	33.42	123	54.9	12	53.41	29	46.6	17	29.52	31	63.1	26
30.8	5.54	37	60.1	22	34.74	132	54.2	7	53.72	31	48.1	15	29.84	32	60.9	22
b. 9.8	5.92	38	58.4	17	36.10	136	54.0	2	54.04	32	49.4	13	30.18	34	59.2	17
19.8	6.30	38	57.3	11	37.49	139	54.3	3	54.36	32	50.6	12	30.53	35	58.0	12
ar. 1.7	6.68	38	56.8	5	38.86	137	55.1	8	54.67	31	51.5	9	30.87	34	57.3	7
11.7	7.05	37	57.0	2	40.19	133	56.4	13	54.97	30	52.2	7	31.20	33	57.3	0
21.7	7.39	34	57.8	8	41.46	127	58.0	16	55.26	29	52.5	3	31.51	31	57.8	5
31.6	7.71	32	59.1	13	42.65	119	60.0	20	55.52	26	52.6	1	31.79	28	58.8	10
pr. 10.6	7.99	28	61.0	19	43.73	108	62.3	23	55.77	25	52.5	1	32.05	26	60.4	16
20.6	8.23	24	63.2	22	44.69	96	64.8	25	55.99	22	52.1	4	32.28	23	62.3	19
30.6	8.43	20	65.8	26	45.51	82	67.6	28	56.18	19	51.6	5	32.47	19	64.5	22
ay 10.5	8.58	15	68.6	28	46.18	67	70.6	30	56.35	17	50.9	7	32.62	15	67.0	25
20.5	8.68	10	71.6	30	46.68	50	73.6	30	56.49	14	50.1	8	32.74	12	69.6	26
30.5	8.74	6	74.6	30	47.02	34	76.6	30	56.60	11	49.2	9	32.82	8	72.2	26
ne 9.5	8.75	1	77.5	29	47.18	16	79.6	30	56.68	8	48.3	9	32.86	4	74.9	27
19.4	8.71	4	80.2	27	47.16	2	82.5	29	56.73	5	47.4	9	32.86	0	77.4	25
29.4	8.63	8	82.7	25	46.97	19	85.2	27	56.74	1	46.5	9	32.81	5	79.7	23
ly 9.4	8.50	13	84.9	22	46.60	37	87.6	24	56.72	2	45.7	8	32.73	8	81.8	21
19.3	8.34	16	86.8	19	46.08	52	89.6	20	56.67	5	45.0	7	32.62	11	83.5	17
29.3	8.14	20	88.3	15	45.42	66	91.3	17	56.59	8	44.3	7	32.47	15	85.0	15
ug. 8.3	7.91	23	89.4	11	44.65	77	92.5	12	56.48	11	43.7	6	32.30	17	86.1	11
18.3	7.66	25	90.0	6	43.79	86	93.3	8	56.35	13	43.2	5	32.10	20	86.8	7
28.2	7.39	27	90.1	1	42.87	92	93.5	2	56.20	15	42.9	3	31.89	21	87.0	2
ept. 7.2	7.12	27	89.8	3	41.94	93	93.1	4	56.05	15	42.6	3	31.67	22	86.9	1
17.2	6.85	27	89.0	8	41.03	91	92.2	9	55.90	15	42.5	1	31.46	21	86.4	5
27.2	6.59	26	87.7	13	40.19	84	90.8	14	55.75	15	42.6	1	31.25	21	85.4	10
ct. 7.1	6.36	23	86.0	17	39.45	74	89.0	18	55.63	12	42.8	2	31.06	19	84.0	14
17.1	6.17	19	83.8	22	38.85	60	86.7	23	55.54	9	43.1	3	30.91	15	82.2	18
27.1	6.02	15	81.3	25	38.43	42	84.1	26	55.48	6	43.7	6	30.79	12	80.1	21
ov. 6.0	5.92	10	78.4	29	38.21	22	81.3	28	55.46	2	44.4	7	30.72	7	77.6	25
16.0	5.88	4	75.3	31	38.20	1	78.3	30	55.49	3	45.3	9	30.71	1	74.8	28
26.0	5.91	3	71.9	34	38.42	22	75.4	29	55.58	9	46.4	11	30.75	4	71.8	30
ec. 6.0	6.00	9	68.5	34	38.86	44	72.5	29	55.71	13	47.7	13	30.84	9	68.7	31
15.9	6.16	16	65.0	35	39.52	66	69.9	26	55.88	17	49.2	15	30.99	15	65.5	32
25.9	6.37	21	61.5	35	40.38	86	67.6	23	56.10	22	50.8	16	31.19	20	62.3	32
35.9	6.64	27	58.3	32	41.40	102	65.7	19	56.36	26	52.4	16	31.44	25	59.3	30
c δ, Tan δ	1.418		+1.005		5.010		−4.909		1.002		−0.061		1.207		+0.676	
an Place	5ˢ.484		86″.16		36ˢ.008		61″.45		53ˢ.373		34″.40		29ˢ.697		84″.81	
$_\psi \alpha$, $D_\omega \alpha$	−0.02		+0.03		+0.11		−0.16		0.00		0.00		−0.02		+0.02	
$_\psi \delta$, $D_\omega \delta$	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	19 Ursæ Minoris. Mag. 5.5				γ^2 Normæ. Mag. 4.1				δ Ophiuchi. Mag. 3.3				σ Scorpii. Mag. 3.1		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Decli- tion S
	h m 16 13 s		° ′ +76 5 ″		h m 16 13 s		° ′ −49 56 ″		h m 16 13 s		° ′ − 4 29 ″		h m 16 16 s		° −25 ″
Jan. 0.9	9.90		10.9		27.09		53.1		48.78		18.7		0.47		27.6
10.9	10.48	58	7.8	31	27.50	41	52.5	6	49.05	27	20.3	16	0.78	31	28.2
20.8	11.18	70	5.1	27	27.94	44	52.3	2	49.35	30	21.8	15	1.11	33	28.9
30.8	12.00	82	3.0	21	28.40	46	52.3	0	49.66	31	23.3	15	1.45	34	29.7
Feb. 9.8	12.89	89	1.5	15	28.88	48	52.7	4	49.98	32	24.7	14	1.80	35	30.6
19.8	13.83	94	0.6	9	29.36	48	53.3	6	50.30	32	25.8	11	2.16	36	31.6
Mar. 1.7	14.78	95	0.4	2	29.83	47	54.2	9	50.61	31	26.7	9	2.51	35	32.5
11.7	15 70	92	0.9	5	30.28	45	55.3	11	50.91	30	27.4	7	2.84	33	33.4
21.7	16.56	86	2.0	11	30.72	44	56.6	13	51.20	29	27.7	3	3.16	32	34.2
31.7	17.34	78	3.7	17	31.12	40	58.0	14	51.47	27	27.8	1	3.46	30	35.0
Apr. 10.6	18.02	68	6.0	23	31.50	38	59.6	16	51.72	25	27.7	1	3.74	28	35.7
20.6	18.56	54	8.6	26	31.85	35	61.3	17	51.94	22	27.4	3	4.00	26	36.3
30.6	18.96	40	11.6	30	32.15	30	63.1	18	52.14	20	26.9	5	4.23	23	36.9
May 10.5	19.22	26	14.8	32	32.42	27	64.9	18	52.31	17	26.2	7	4.43	20	37.4
20.5	19.31	9	18.0	32	32.64	22	66.7	18	52.46	15	25.4	8	4.60	17	37.8
30.5	19.25	6	21.3	33	32.80	16	68.5	18	52.58	12	24.6	8	4.74	14	38.2
June 9.5	19.03	22	24.4	31	32.92	12	70.2	17	52.66	8	23.7	9	4.84	10	38.6
19.4	18.67	36	27.4	30	32.99	7	71.9	17	52.71	5	22.9	8	4.90	6	38.9
29.4	18.18	49	30.0	26	33.00	1	73.4	15	52.73	2	22.1	8	4.93	3	39.1
July 9.4	17.56	62	32.3	23	32.96	4	74.7	13	52.71	2	21.3	8	4.92	1	39.3
19.4	16.84	72	34.2	19	32.86	10	75.8	11	52.66	5	20.5	8	4.87	5	39.4
29.3	16.03	81	35.6	14	32.72	14	76.7	9	52.58	8	19.9	6	4.79	8	39.4
Aug. 8.3	15.14	89	36.6	10	32.54	18	77.3	6	52.48	10	19.3	6	4.67	12	39.4
18.3	14.21	93	37.1	5	32.32	22	77.6	3	52.35	13	18.9	4	4.53	14	39.3
28.2	13.25	96	37.0	1	32.08	24	77.5	1	52.20	15	18.5	4	4.37	16	39.0
Sept. 7.2	12.28	97	36.4	6	31.83	25	77.1	4	52.05	15	18.2	3	4.21	16	38.6
17.2	11.32	96	35.3	11	31.59	24	76.4	7	51.89	16	18.1	1	4.04	17	38.2
27.2	10.41	91	33.7	16	31.36	23	75.4	10	51.75	14	18.1	0	3.88	16	37.7
Oct. 7.1	9.56	85	31.6	21	31.16	20	74.1	13	51.63	12	18.3	2	3.75	13	37.1
17.1	8.80	76	29.1	25	31.00	16	72.6	15	51.53	10	18.6	3	3.64	11	36.6
27.1	8.15	65	26.2	29	30.90	10	70.9	17	51.47	6	19.0	4	3.58	6	36.0
Nov. 6.1	7.63	52	23.0	32	30.87	3	69.2	17	51.45	2	19.7	7	3.56	2	35.5
16.0	7.26	37	19.5	35	30.91	4	67.4	18	51.48	3	20.6	9	3.60	4	35.1
26.0	7.05	21	15.9	36	31.03	12	65.7	17	51.56	8	21.6	10	3.69	9	34.8
Dec. 6.0	7.02	3	12.2	37	31.22	19	64.2	15	51.68	12	22.8	12	3.84	15	34.8
15.9	7.17	15	8.5	37	31.47	25	62.8	14	51.86	18	24.2	14	4.04	20	34.9
25.9	7.48	31	5.0	35	31.80	33	61.7	11	52.08	22	25.7	15	4.28	24	35.1
35.9	7.96	48	1.7	33	32.18	38	60.9	8	52.33	25	27.2	15	4.57	29	35.6
Sec δ, Tan δ	4.159		+4.037		1.554		−1.190		1.003		−0.079		1.107		−0.47
Mean Place	13ˢ.911		31″.08		28ˢ.249		53″.18		49ˢ.326		10″.00		1ˢ.137		23″.18
D′ψ a, Dω a	−0.10		+0.12		+0.03		−0.04		0.00		0.00		+0.01		−0.01
Dψ δ, Dω δ	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	τ Herculis. Mag. 3.9				γ Herculis. Mag. 3.8				η Ursæ Minoris. Mag. 5.0				γ Apodis. Mag. 3.9			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 16 17		° ′ +46 30		h m 16 18		° ′ +19 20		h m 16 19		° ′ +75 56		h m 16 20		° ′ −78 42	
	s		″		s		″		s		″		s		″	
an. 0.9	10.08		37.1		9.56		53.6		54.19		46.3		17.30		27.6	
10.9	10.37	29	34.0	31	9.82	26	51.1	25	54.74	55	43.2	31	18.39	109	25.8	18
20.8	10.70	33	31.2	28	10.10	28	48.8	23	55.43	69	40.4	28	19.62	123	24.4	14
30.8	11.06	36	28.8	24	10.41	31	46.8	20	56.22	79	38.2	22	20.94	132	23.5	9
eb. 9.8	11.44	38	27.1	17	10.72	31	45.1	17	57.09	87	36.6	16	22.32	138	23.1	4
19.8	11.83	39	25.9	12	11.04	32	43.9	12	58.01	92	35.7	9	23.72	140	23.2	1
ar. 1.7	12.22	39	25.3	6	11.36	32	43.1	8	58.95	94	35.4	3	25.13	141	23.8	6
11.7	12.60	38	25.4	1	11.66	30	42.8	3	59.87	92	35.8	4	26.51	138	24.8	10
21.7	12.95	35	26.1	7	11.95	29	42.9	1	60.73	86	36.8	10	27.83	132	26.2	14
31.7	13.28	33	27.4	13	12.22	27	43.6	7	61.52	79	38.5	17	29.07	124	28.0	18
pr. 10.6	13.58	30	29.2	18	12.47	25	44.6	10	62.20	68	40.7	22	30.22	115	30.2	22
20.6	13.83	25	31.5	23	12.69	22	46.0	14	62.76	56	43.3	26	31.24	102	32.6	24
30.6	14.05	22	34.1	26	12.88	19	47.6	16	63.19	43	46.2	29	32.13	89	35.3	27
ay 10.5	14.21	16	36.9	28	13.05	17	49.5	19	63.46	27	49.4	32	32.87	74	38.1	28
20.5	14.33	12	39.9	30	13.18	13	51.5	20	63.58	12	52.6	32	33.45	58	41.0	29
30.5	14.40	7	42.9	30	13.28	10	53.6	21	63.54	4	55.9	33	33.85	40	44.0	30
une 9.5	14.42	2	45.9	30	13.35	7	55.7	21	63.35	19	59.1	32	34.08	23	47.0	30
19.4	14.39	3	48.7	28	13.38	3	57.7	20	63.02	33	62.1	30	34.12	4	49.9	29
29.4	14.31	8	51.4	27	13.37	1	59.6	19	62.55	47	64.8	27	33.97	15	52.7	28
uly 9.4	14.19	12	53.7	23	13.33	4	61.3	17	61.96	59	67.2	24	33.65	32	55.2	25
19.4	14.03	16	55.7	20	13.26	7	62.8	15	61.26	70	69.2	20	33.16	49	57.3	21
29.3	13.82	21	57.3	16	13.15	11	64.1	13	60.47	79	70.8	16	32.52	64	59.1	18
ug. 8.3	13.59	23	58.5	12	13.02	13	65.1	10	59.60	87	71.8	10	31.76	76	60.5	14
18.3	13.33	26	59.2	7	12.87	15	65.8	7	58.68	92	72.4	6	30.90	86	61.4	9
28.2	13.05	28	59.5	3	12.70	17	66.2	4	57.72	96	72.4	0	29.97	93	61.7	3
ept. 7.2	12.77	28	59.3	2	12.52	18	66.3	1	56.75	97	72.0	4	29.01	96	61.5	2
17.2	12.48	29	58.6	7	12.34	18	66.0	3	55.80	95	71.0	10	28.07	94	60.8	7
27.2	12.21	27	57.4	12	12.17	17	65.4	6	54.89	91	69.5	15	27.18	89	59.6	12
ct. 7.1	11.97	24	55.8	16	12.02	15	64.5	9	54.03	86	67.5	20	26.39	79	57.9	17
17.1	11.75	22	53.8	20	11.90	12	63.3	12	53.25	78	65.1	24	25.73	66	55.7	22
27.1	11.58	17	51.3	25	11.81	9	61.7	16	52.58	67	62.3	28	25.25	48	53.2	25
Nov. 6.1	11.47	11	48.5	28	11.76	5	59.9	18	52.04	54	59.2	31	24.96	29	50.4	28
16.0	11.41	6	45.4	31	11.76	0	57.8	21	51.65	39	55.8	34	24.89	7	47.5	29
26.0	11.42	1	42.0	34	11.82	6	55.4	24	51.42	23	52.2	36	25.05	16	44.5	30
Dec. 6.0	11.49	7	38.5	35	11.92	10	52.9	25	51.36	6	48.5	37	25.44	39	41.6	29
15.9	11.63	14	35.0	35	12.07	15	50.3	26	51.48	12	44.8	37	26.05	61	38.9	27
25.9	11.83	20	31.5	35	12.27	20	47.7	26	51.77	29	41.2	36	26.87	82	36.4	25
35.9	12.08	25	28.2	33	12.51	24	45.1	26	52.22	45	37.9	33	27.86	99	34.4	20
ec δ, Tan δ	1.453		+1.054		1.060		+0.351		4.119		+3.995		5.109		−5.010	
ean Place	11ˢ.149		54″.78		10ˢ.185		67″.03		58ˢ.320		65″.99		22ˢ.413		30″.41	
$_\psi \alpha$, $D_\omega \alpha$	−0.03		+0.03		−0.01		+0.01		−0.10		+0.11		+0.12		−0.14	
$_\psi \delta$, $D_\omega \delta$	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ω Herculis. Mag. 4.5				η Draconis. Mag. 2.9				α Scorpii. (*Antares.*) Mag. 1.2				β Herculis. Mag. 2.8		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declin tion N
	h m		° ′		h m		° ′		h m		° ′		h m		°
	16 21		+14 13		16 22		+61 41		16 24		−26 14		16 26		+21
	s		″		s		″		s		″		s		″
Jan. 0.9	28.71		29.2		48.40		64.0		10.88		44.0		33.19		12.9
10.9	28.97	26	26.9	23	48.74	34	60.8	32	11.18	30	44.4	4	33.44	25	10.3
20.9	29.25	28	24.7	22	49.15	41	57.9	29	11.51	33	45.0	6	33.72	28	7.9
30.8	29.55	30	22.8	19	49.61	46	55.5	24	11.85	34	45.8	8	34.03	31	5.8
Feb. 9.8	29.86	31	21.2	16	50.11	50	53.8	17	12.20	35	46.6	8	34.34	31	4.1
19.8	30.18	32	19.9	13	50.63	52	52.6	12	12.56	36	47.5	9	34.66	32	2.8
Mar. 1.7	30.49	31	19.1	8	51.15	52	52.1	5	12.91	35	48.3	8	34.98	32	2.0
11.7	30.79	30	18.7	4	51.66	51	52.4	3	13.25	34	49.2	9	35.29	31	1.7
21.7	31.08	29	18.8	1	52.14	48	53.2	8	13.58	33	50.0	8	35.58	29	1.9
31.7	31.34	26	19.2	4	52.58	44	54.7	15	13.88	30	50.7	7	35.86	28	2.5
Apr. 10.6	31.59	25	20.0	8	52.98	40	56.8	21	14.17	29	51.3	6	36.11	25	3.6
20.6	31.82	23	21.2	12	53.31	33	59.3	25	14.44	27	52.0	7	36.34	23	5.0
30.6	32.02	20	22.6	14	53.58	27	62.1	28	14.68	24	52.5	5	36.54	20	6.8
May 10.5	32.18	16	24.3	17	53.78	20	65.2	31	14.89	21	53.0	5	36.72	18	8.8
20.5	32.32	14	26.1	18	53.90	12	68.4	32	15.07	18	53.5	5	36.86	14	10.9
30.5	32.43	11	27.9	18	53.95	5	71.7	33	15.21	14	53.9	4	36.96	10	13.1
June 9.5	32.50	7	29.8	19	53.92	3	74.9	32	15.32	11	54.3	4	37.03	7	15.3
19.4	32.54	4	31.6	18	53.82	10	78.0	31	15.40	8	54.6	3	37.07	4	17.5
29.4	32.55	1	33.3	17	53.65	17	80.8	28	15.43	3	54.9	3	37.06	1	19.5
July 9.4	32.52	3	34.9	16	53.42	23	83.3	25	15.42	1	55.1	2	37.03	3	21.4
19.4	32.46	6	36.2	13	53.12	30	85.4	21	15.38	4	55.3	2	36.95	8	23.0
29.3	32.36	10	37.4	12	52.77	35	87.1	17	15.30	8	55.4	1	36.85	10	24.4
Aug. 8.3	32.24	12	38.4	10	52.38	39	88.3	12	15.19	11	55.4	0	36.72	13	25.4
18.3	32.10	14	39.0	6	51.96	42	89.1	8	15.05	14	55.3	1	36.56	16	26.2
28.2	31.94	16	39.4	4	51.52	44	89.3	2	14.89	16	55.1	2	36.38	18	26.7
Sept. 7.2	31.77	17	39.6	2	51.06	46	89.0	3	14.72	17	54.8	3	36.20	18	26.8
17.2	31.60	17	39.5	1	50.60	46	88.2	8	14.55	17	54.3	5	36.01	19	26.5
27.2	31.43	17	39.0	5	50.17	43	86.9	13	14.39	16	53.8	5	35.84	17	25.9
Oct. 7.1	31.29	14	38.2	8	49.76	41	85.1	18	14.25	14	53.3	5	35.68	16	25.0
17.1	31.17	12	37.2	10	49.40	36	82.8	23	14.14	11	52.7	6	35.54	14	23.8
27.1	31.09	8	35.9	13	49.10	30	80.1	27	14.07	7	52.1	6	35.44	10	22.2
Nov. 6.1	31.05	4	34.3	16	48.87	23	77.1	30	14.05	2	51.6	5	35.38	6	20.3
16.0	31.05	0	32.5	18	48.72	15	73.7	34	14.08	3	51.1	5	35.37	1	18.1
26.0	31.10	5	30.4	21	48.65	7	70.1	36	14.16	8	50.8	3	35.41	4	15.7
Dec. 6.0	31.21	11	28.2	22	48.68	3	66.4	37	14.30	14	50.6	2	35.50	9	13.1
15.9	31.36	15	25.8	24	48.80	12	62.7	37	14.49	19	50.6	0	35.65	15	10.4
25.9	31.56	20	23.4	24	49.01	21	59.1	36	14.72	23	50.8	2	35.83	18	7.7
35.9	31.79	23	21.0	24	49.30	29	55.7	34	15.00	28	51.2	4	36.06	23	5.0
Sec δ, Tan δ	1.032		+0.253		2.110		+1.857		1.115		−0.493		1.076		+0.397
Mean Place	$29^{s}.321$		41″.60		$50^{s}.274$		82″.83		$11^{s}.574$		39″.44		$33^{s}.876$		26″.44
$D'_{\psi}a$, $D_{\omega}a$	−0.01		+0.01		−0.04		+0.05		+0.01		−0.01		−0.01		+0.01
$D_{\psi}\delta$, $D_{\omega}\delta$	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	λ Ophiuchi. Mag. 3.8				A Draconis. Mag. 5.0				τ Scorpii. Mag. 2.9				σ Herculis. Mag. 4.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 16 26		° ′ + 2 9		h m 16 28		° ′ +68 56		h m 16 30		° ′ −28 2		h m 16 31		° ′ +42 36	
	s		″		s		″		s		″		s		″	
n. 0.9	36.92		59.0		5.85		48.6		34.55		30.7		20.69		25.4	
10.9	37.18	26	57.1	19	6.25	40	45.3	33	34.85	30	31.1	4	20.96	27	22.3	31
20.9	37.46	28	55.3	18	6.73	48	42.4	29	35.18	33	31.6	5	21.26	30	19.5	28
30.8	37.76	30	53.7	16	7.29	56	40.1	23	35.52	34	32.2	6	21.60	34	17.1	24
eb. 9.8	38.07	31	52.3	14	7.91	62	38.3	18	35.88	36	32.9	7	21.96	36	15.2	19
19.8	38.38	31	51.1	12	8.55	64	37.1	12	36.24	36	33.7	8	22.32	36	13.9	13
ar. 1.7	38.69	31	50.2	9	9.21	66	36.7	4	36.60	36	34.5	8	22.69	37	13.2	7
11.7	38.99	30	49.7	5	9.86	65	36.9	2	36.95	35	35.3	8	23.05	36	13.1	1
21.7	39.28	29	49.5	2	10.48	62	37.8	9	37.28	33	36.0	7	23.40	35	13.6	5
31.7	39.55	27	49.6	1	11.05	57	39.3	15	37.60	32	36.7	7	23.72	32	14.7	11
pr. 10.6	39.80	25	50.0	4	11.55	50	41.3	20	37.89	29	37.4	7	24.02	30	16.3	16
20.6	40.03	23	50.7	7	11.97	42	43.8	25	38.16	27	38.1	7	24.28	26	18.4	21
30.6	40.24	21	51.6	9	12.31	34	46.7	29	38.41	25	38.7	6	24.50	22	20.9	25
ay 10.6	40.42	18	52.6	10	12.55	24	49.9	32	38.63	22	39.2	5	24.68	18	23.6	27
20.5	40.57	15	53.8	12	12.68	13	53.2	33	38.82	19	39.8	6	24.82	14	26.5	29
30.5	40.69	12	55.0	12	12.72	4	56.5	33	38.98	16	40.3	5	24.91	9	29.5	30
une 9.5	40.78	9	56.3	13	12.65	7	59.7	32	39.10	12	40.7	4	24.96	5	32.4	29
19.4	40.84	6	57.5	12	12.49	16	62.8	31	39.18	8	41.2	5	24.96	0	35.3	29
29.4	40.86	2	58.7	12	12.23	26	65.7	29	39.22	4	41.5	3	24.91	5	37.9	26
uly 9.4	40.85	1	59.8	11	11.88	35	68.2	25	39.22	0	41.9	4	24.82	9	40.3	24
19.4	40.80	5	60.8	10	11.46	42	70.4	22	39.18	4	42.1	2	24.68	14	42.4	21
29.3	40.73	7	61.7	9	10.97	49	72.1	17	39.10	8	42.3	2	24.51	17	44.2	18
ug. 8.3	40.62	11	62.4	7	10.43	54	73.3	12	38.99	11	42.4	1	24.30	21	45.5	13
18.3	40.49	13	63.0	6	9.84	59	74.1	8	38.85	14	42.4	0	24.07	23	46.4	9
28.3	40.34	15	63.4	4	9.22	62	74.3	2	38.69	16	42.2	2	23.82	25	46.9	5
ept. 7.2	40.18	16	63.6	2	8.59	63	74.0	3	38.52	17	41.9	3	23.56	26	46.9	0
17.2	40.03	15	63.6	0	7.96	63	73.2	8	38.35	17	41.5	4	23.29	27	46.4	5
27.2	39.88	15	63.5	1	7.35	61	71.9	13	38.18	17	41.0	5	23.04	25	45.4	10
ct. 7.1	39.74	14	63.2	3	6.78	57	70.1	18	38.03	15	40.4	6	22.80	24	44.0	14
17.1	39.63	11	62.6	6	6.27	51	67.8	23	37.92	11	39.8	6	22.60	20	42.2	18
27.1	39.55	8	61.8	8	5.83	44	65.2	26	37.84	8	39.1	7	22.43	17	40.0	22
Nov. 6.1	39.52	3	60.9	9	5.48	35	62.1	31	37.81	3	38.5	6	22.31	12	37.4	26
16.0	39.53	1	59.7	12	5.23	25	58.7	34	37.83	2	38.0	5	22.25	6	34.5	29
26.0	39.59	6	58.3	14	5.09	14	55.1	36	37.91	8	37.5	5	22.25	0	31.3	32
Dec. 6.0	39.70	11	56.7	16	5.07	2	51.4	37	38.04	13	37.2	3	22.31	6	27.9	34
16.0	39.86	16	55.0	17	5.17	10	47.7	37	38.23	19	37.1	1	22.43	12	24.5	34
25.9	40.06	20	53.2	18	5.39	22	44.0	37	38.46	23	37.1	0	22.61	18	21.1	34
35.9	40.30	24	51.4	18	5.72	33	40.6	34	38.74	28	37.4	3	22.84	23	17.9	32
ec δ, Tan δ	1.001		+0.038		2.784		+2.598		1.133		−0.533		1.359		+0.920	
ean Place	37ˢ.506		68″.98		8ˢ.583		67″.41		35ˢ.282		26″.34		21ˢ.748		41″.87	
$_\psi \alpha$, $D_m \alpha$	0.00		0.00		−0.06		+0.07		+0.01		−0.01		−0.02		+0.02	
$_\psi \delta$, $D_m \delta$	−0.2		−0.9		−0.2		−0.9		−0.2		−0.9		−0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Ophiuchi. Mag. 2.7				24 Scorpii. Mag. 5.0				ζ Herculis. Mag. 3.0				α Triang. Aust. Mag. 1.9		
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.
	h m 16 32		° ′ −10 23		h m 16 36		° ′ −17 34		h m 16 38		° ′ +31 44		h m 16 39		° −68 5
	s		″		s		″		s		″		s		
Jan. 0.9	27.98	26	52.4	13	38.63	27	49.0	8	4.03	25	67.4	29	36.53	61	22.9
10.9	28.24	29	53.7	12	38.90	30	49.8	9	4.28	28	64.5	26	37.14	68	21.2
20.9	28.53	31	54.9	12	39.20	32	50.7	10	4.56	30	61.9	23	37.82	74	19.9
30.8	28.84	32	56.1	12	39.52	33	51.7	9	4.86	33	59.6	19	38.56	78	19.0
Feb. 9.8	29.16	32	57.3	10	39.85	33	52.6	9	5.19	33	57.7	13	39.34	79	18.5
19.8	29.48	32	58.3	8	40.18	33	53.5	8	5.52	33	56.4	9	40.13	80	18.5
Mar. 1.8	29.80	32	59.1	7	40.51	33	54.3	7	5.85	33	55.5	2	40.93	79	18.8
11.7	30.12	30	59.8	4	40.84	31	55.0	5	6.18	31	55.3	3	41.72	77	19.5
21.7	30.42	28	60.2	2	41.15	29	55.5	4	6.49	30	55.6	9	42.49	73	20.6
31.7	30.70	26	60.4	1	41.44	28	55.9	3	6.79	27	56.5	13	43.22	68	22.0
Apr. 10.6	30.96	25	60.5	1	41.72	26	56.2	2	7.06	24	57.8	18	43.90	62	23.7
20.6	31.21	22	60.4	3	41.98	23	56.4	0	7.30	22	59.6	21	44.52	56	25.7
30.6	31.43	20	60.1	4	42.21	21	56.4	0	7.52	18	61.7	24	45.08	49	27.9
May 10.6	31.63	17	59.7	5	42.42	18	56.4	1	7.70	15	64.1	26	45.57	40	30.3
20.5	31.80	13	59.2	6	42.60	15	56.3	2	7.85	11	66.7	26	45.97	31	32.8
30.5	31.93	11	58.6	6	42.75	12	56.1	1	7.96	7	69.3	27	46.28	22	35.4
June 9.5	32.04	7	58.0	5	42.87	8	56.0	2	8.03	3	72.0	26	46.50	12	37.9
19.5	32.11	4	57.5	6	42.95	4	55.8	2	8.06	2	74.6	24	46.62	1	40.5
29.4	32.15	1	56.9	6	42.99	1	55.6	2	8.04	5	77.0	22	46.63	8	42.9
July 9.4	32.14	3	56.3	5	43.00	3	55.4	2	7.99	9	79.2	20	46.55	18	45.1
19.4	32.11	7	55.8	4	42.97	7	55.2	2	7.90	12	81.2	17	46.37	27	47.1
29.3	32.04	10	55.4	4	42.90	10	55.0	2	7.78	16	82.9	13	46.10	36	48.8
Aug. 8.3	31.94	12	55.0	4	42.80	13	54.8	3	7.62	18	84.2	9	45.74	41	50.1
18.3	31.82	15	54.6	4	42.67	14	54.5	2	7.44	20	85.1	6	45.33	46	51.0
28.3	31.67	15	54.2	3	42.53	16	54.3	3	7.24	22	85.7	1	44.87	49	51.5
Sept. 7.2	31.52	16	53.9	2	42.37	16	54.0	3	7.02	22	85.8	2	44.38	50	51.5
17.2	31.36	15	53.7	1	42.21	16	53.7	3	6.80	21	85.6	7	43.88	47	51.0
27.2	31.21	13	53.6	1	42.05	14	53.4	2	6.59	19	84.9	11	43.41	43	50.0
Oct. 7.1	31.08	11	53.5	1	41.91	11	53.2	3	6.40	17	83.8	14	42.98	36	48.6
17.1	30.97	8	53.6	2	41.80	8	52.9	1	6.23	14	82.4	19	42.62	27	46.8
27.1	30.89	3	53.8	3	41.72	4	52.8	1	6.09	9	80.5	22	42.35	17	44.6
Nov. 6.1	30.86	1	54.1	4	41.68	2	52.7	1	6.00	4	78.3	25	42.18	5	42.2
16.0	30.87	7	54.5	7	41.70	6	52.8	2	5.96	1	75.8	28	42.13	7	39.7
26.0	30.94	11	55.2	8	41.76	12	53.0	3	5.97	7	73.0	30	42.20	21	37.1
Dec. 6.0	31.05	17	56.0	9	41.88	17	53.3	5	6.04	12	70.0	30	42.41	33	34.5
16.0	31.22	20	56.9	11	42.05	21	53.8	6	6.16	17	67.0	31	42.74	45	32.0
25.9	31.42	25	58.0	12	42.26	25	54.4	8	6.33	22	63.9	30	43.19	55	29.8
35.9	31.67		59.2		42.51		55.2		6.55		60.9		43.74		27.9
Sec δ, Tan δ	1.017		−0.184		1.049		−0.317		1.176		+0.619		2.775		−2.588
Mean Place	$28^s.593$		44″.78		$39^s.286$		42″.54		$4^s.895$		82″.12		$39^s.107$		23′.62
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		0.00		+0.01		−0.01		−0.02		+0.01		+0.06		−0.06
$D_\psi \delta$, $D_\omega \delta$	−0.1		−0.9		−0.1		−0.9		−0.1		−0.9		−0.1		−0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	**η Herculis.** Mag. 3.6				**Groombridge 2377.** Mag. 4.9				**ε Scorpii.** Mag. 2.4				**49 Herculis.** Mag. 6.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	16 39		+39 4		16 43		+56 55		16 44		−34 8		16 48		+15 6	
	s		″		s		″		s		″		s		″	
n. 0.9	57.85		44.1		39.33		43.4		38.43		28.2		11.91		45.6	
10.9	58.10	25	41.0	31	39.61	28	40.1	33	38.73	30	28.1	1	12.14	23	43.2	24
20.9	58.39	29	38.2	28	39.96	35	37.1	30	39.06	33	28.2	1	12.41	27	41.0	22
30.8	58.71	32	35.8	24	40.35	39	34.5	26	39.42	36	28.5	3	12.69	28	39.0	20
eb. 9.8	59.05	34	33.8	20	40.78	43	32.5	20	39.79	37	28.9	4	13.00	31	37.4	16
19.8	59.41	36	32.4	14	41.23	45	31.1	14	40.17	38	29.4	5	13.31	31	36.1	13
ar. 1.8	59.76	35	31.6	8	41.69	46	30.4	7	40.55	38	30.0	6	13.62	31	35.2	9
11.7	60.11	35	31.4	2	42.15	46	30.3	1	40.92	37	30.7	7	13.92	30	34.7	5
21.7	60.45	34	31.8	4	42.59	44	30.9	6	41.28	36	31.4	7	14.22	30	34.7	0
31.7	60.76	31	32.8	10	43.01	42	32.1	12	41.62	34	32.2	8	14.50	28	35.2	5
pr. 10.6	61.05	29	34.3	15	43.38	37	33.9	18	41.94	32	33.0	8	14.76	26	36.0	8
20.6	61.31	26	36.3	20	43.71	33	36.2	23	42.24	30	33.7	7	15.00	24	37.2	12
30.6	61.54	23	38.6	23	43.99	28	38.9	27	42.52	28	34.5	8	15.22	22	38.7	15
ay 10.6	61.73	19	41.2	26	44.21	22	41.9	30	42.77	25	35.3	8	15.42	20	40.4	17
20.5	61.88	15	44.0	28	44.37	16	45.1	32	42.98	21	36.1	8	15.58	16	42.3	19
30.5	61.98	10	46.9	29	44.46	9	48.4	33	43.16	18	36.9	8	15.71	13	44.3	20
une 9.5	62.04	6	49.8	29	44.49	3	51.6	32	43.30	14	37.7	8	15.81	10	46.3	20
19.5	62.06	2	52.6	28	44.45	4	54.7	31	43.40	10	38.5	8	15.87	6	48.2	19
29.4	62.03	3	55.2	26	44.35	10	57.7	30	43.45	5	39.2	7	15.90	3	50.1	19
uly 9.4	61.96	7	57.6	24	44.19	16	60.4	27	43.46	1	39.9	7	15.89	1	51.8	17
19.4	61.85	11	59.7	21	43.97	22	62.7	23	43.43	3	40.5	6	15.84	5	53.4	16
29.3	61.70	15	61.5	18	43.71	26	64.7	20	43.35	8	40.9	4	15.76	8	54.7	13
ug. 8.3	61.52	18	62.9	14	43.40	31	66.2	15	43.24	11	41.2	3	15.65	11	55.8	11
18.3	61.30	22	63.9	10	43.05	35	67.3	11	43.09	15	41.4	2	15.51	14	56.6	8
28.3	61.07	23	64.5	6	42.67	38	67.8	5	42.92	17	41.4	0	15.35	16	57.2	6
ept. 7.2	60.83	24	64.6	1	42.28	39	67.9	1	42.73	19	41.2	2	15.18	17	57.5	3
17.2	60.58	25	64.2	4	41.89	39	67.4	5	42.54	19	40.9	3	15.00	18	57.5	0
27.2	60.34	24	63.4	8	41.51	38	66.4	10	42.36	18	40.4	5	14.83	17	57.2	3
ct. 7.2	60.12	22	62.2	12	41.15	36	65.0	14	42.19	17	39.7	7	14.67	16	56.5	7
17.1	59.92	20	60.6	16	40.83	32	63.0	20	42.05	14	38.9	8	14.53	14	55.6	9
27.1	59.76	16	58.5	21	40.55	28	60.6	24	41.95	10	38.0	9	14.42	11	54.4	12
ov. 6.1	59.65	11	56.0	25	40.33	22	57.8	28	41.90	5	37.1	9	14.36	6	52.9	15
16.0	59.59	6	53.3	27	40.18	15	54.7	31	41.91	1	36.2	9	14.34	2	51.1	18
26.0	59.58	1	50.2	31	40.10	8	51.3	34	41.97	6	35.4	8	14.36	2	49.1	20
Dec. 6.0	59.64	6	47.0	32	40.11	1	47.7	36	42.09	12	34.7	7	14.44	8	46.9	22
16.0	59.75	11	43.7	33	40.19	8	44.1	36	42.28	19	34.1	6	14.57	13	44.6	23
25.9	59.92	17	40.4	33	40.36	17	40.4	37	42.51	23	33.7	4	14.74	17	42.2	24
35.9	60.14	22	37.2	32	40.60	24	36.9	35	42.79	28	33.5	2	14.95	21	39.8	24
ec δ, Tan δ	1.288		+0.812		1.833		+1.536		1.208		−0.678		1.036		+0.270	
ean Place	58ˢ.872		59″.66		41ˢ.071		60″.48		39ˢ.268		24″.25		12ˢ.623		57″.46	
$D'_\psi \alpha, D_\omega \alpha$	−0.02		+0.02		−0.04		+0.03		+0.02		−0.01		−0.01		+0.01	
$D_\psi \delta, D_\omega \delta$	−0.1		−0.9		−0.1		−0.9		−0.1		−0.9		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε¹ Aræ. Mag. 4.2 Right Ascension.		ε¹ Aræ. Declination S.		κ Ophiuchi. Mag. 3.4 Right Ascension.		κ Ophiuchi. Declination N.		30 Ophiuchi. Mag. 5.0 Right Ascension.		30 Ophiuchi. Declination S.		ε Herculis. Mag. 3.9 Right Ascension.		ε Herculis. Declination N.
	h m 16 52 s		° ′ −53 1 ″		h m 16 53 s		° ′ + 9 30 ″		h m 16 56 s		° ′ − 4 5 ″		h m 16 57 s		° +31 ″
Jan. 0.9	46.85		54.1		37.94		11.9		34.01		54.3		1.27		49.4
10.9	47.24	39	53.0	11	38.18	24	9.8	21	34.25	24	55.8	15	1.50	23	46.5
20.9	47.67	43	52.1	9	38.44	26	7.8	20	34.52	27	57.2	14	1.77	27	43.8
30.8	48.13	46	51.6	5	38.72	28	6.0	18	34.80	28	58.6	14	2.06	29	41.4
Feb. 9.8	48.62	49	51.3	3	39.02	30	4.5	15	35.11	31	59.8	12	2.37	31	39.5
19.8	49.12	50	51.4	1	39.32	30	3.2	13	35.42	31	60.8	10	2.70	33	38.0
Mar. 1.8	49.62	50	51.7	3	39.63	31	2.4	8	35.73	31	61.5	7	3.03	33	37.1
11.7	50.12	50	52.3	6	39.93	30	1.9	5	36.04	31	62.1	6	3.35	32	36.7
21.7	50.61	49	53.1	8	40.23	30	1.8	1	36.34	30	62.3	2	3.67	32	36.9
31.7	51.07	46	54.1	10	40.51	28	2.1	3	36.62	28	62.3	0	3.98	31	37.6
Apr. 10.7	51.51	44	55.3	12	40.77	26	2.8	7	36.89	27	62.1	2	4.26	28	38.8
20.6	51.92	41	56.6	13	41.02	25	3.8	10	37.15	26	61.6	5	4.52	26	40.5
30.6	52.30	38	58.2	16	41.24	22	5.0	12	37.38	23	60.9	7	4.75	23	42.6
May 10.6	52.64	34	59.8	16	41.44	20	6.5	15	37.59	21	60.1	8	4.95	20	44.9
20.5	52.93	29	61.5	17	41.61	17	8.1	16	37.78	19	59.1	10	5.12	17	47.4
30.5	53.17	24	63.3	18	41.75	14	9.8	17	37.93	15	58.1	10	5.25	13	50.1
June 9.5	53.35	18	65.1	18	41.86	11	11.6	18	38.05	12	57.1	10	5.34	9	52.8
19.5	53.48	13	66.9	18	41.93	7	13.3	17	38.14	9	56.1	10	5.39	5	55.4
29.4	53.54	6	68.6	17	41.97	4	14.9	16	38.20	6	55.2	9	5.40	1	57.9
July 9.4	53.54	0	70.2	16	41.97	0	16.4	15	38.21	1	54.3	9	5.37	3	60.2
19.4	53.48	6	71.6	14	41.93	4	17.8	14	38.19	2	53.5	8	5.30	7	62.3
29.4	53.37	11	72.9	13	41.86	7	19.0	12	38.13	6	52.7	8	5.19	11	64.1
Aug. 8.3	53.20	17	73.9	10	41.76	10	20.0	10	38.04	9	52.1	6	5.04	15	65.6
18.3	52.98	22	74.5	6	41.63	13	20.8	8	37.92	12	51.6	5	4.87	17	66.7
28.3	52.74	24	74.9	4	41.48	15	21.3	5	37.78	14	51.2	4	4.67	20	67.4
Sept. 7.2	52.47	27	74.9	0	41.31	17	21.6	3	37.63	15	50.9	3	4.46	21	67.8
17.2	52.19	28	74.6	3	41.14	17	21.7	1	37.47	16	50.8	1	4.24	22	67.7
27.2	51.92	27	73.9	7	40.98	16	21.5	2	37.31	16	50.8	0	4.03	21	67.2
Oct. 7.2	51.67	25	72.8	11	40.82	16	21.0	5	37.16	15	50.9	1	3.83	20	66.3
17.1	51.46	21	71.5	13	40.68	14	20.3	7	37.04	12	51.1	2	3.65	18	65.0
27.1	51.30	16	69.9	16	40.58	10	19.3	10	36.94	10	51.6	5	3.50	15	63.3
Nov. 6.1	51.21	9	68.2	17	40.52	6	18.1	12	36.89	5	52.2	6	3.39	11	61.2
16.1	51.19	2	66.4	18	40.50	2	16.6	15	36.88	1	52.9	7	3.34	5	58.8
26.0	51.25	6	64.5	19	40.53	3	14.9	17	36.92	4	53.9	10	3.33	1	56.2
Dec. 6.0	51.38	13	62.6	19	40.60	7	13.0	19	37.00	8	55.0	11	3.38	5	53.3
16.0	51.60	22	60.9	17	40.73	13	11.0	20	37.14	14	56.2	12	3.48	10	50.3
25.9	51.88	28	59.4	15	40.89	16	8.9	21	37.31	17	57.6	14	3.63	15	47.3
35.9	52.23	35	58.1	13	41.10	21	6.8	21	37.53	22	59.0	14	3.83	20	44.3
Sec δ, Tan δ	1.663		−1.329		1.014		+0.167		1.003		−0.072		1.167		+0.6
Mean Place	48ˢ.200		52″.35		38ˢ.638		22″.86		34ˢ.673		45″.47		2ˢ.216		63″.1
D′ψ α, Dω α	+0.03		−0.03		0.00		0.00		0.00		0.00		−0.02		+0.0
Dψ δ, Dω δ	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	***d* Herculis.** Mag. 5.3				***η* Ophiuchi.** Mag. 2.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 16 58		° ′ +33 40		h m 17 5		° ′ −15 37	
	s		″		s		″	
an. 0.9	27.00		72.2		29.37		21.2	
10.9	27.22	22	69.2	30	29.61	24	22.0	8
20.9	27.49	27	66.4	28	29.89	28	22.9	9
30.9	27.78	29	64.0	24	30.19	30	23.7	8
eb. 9.8	28.10	32	62.0	20	30.50	31	24.5	8
19.8	28.43	33	60.5	15	30.83	33	25.2	7
ar. 1.8	28.77	34	59.6	9	31.15	32	25.8	6
11.7	29.10	33	59.2	4	31.47	32	26.3	5
21.7	29.42	32	59.4	2	31.79	32	26.7	4
31.7	29.73	31	60.2	8	32.09	30	26.9	2
pr. 10.7	30.02	29	61.5	13	32.38	29	26.9	0
20.6	30.29	27	63.2	17	32.66	28	26.8	1
30.6	30.53	24	65.3	21	32.91	25	26.6	2
ay 10.6	30.73	20	67.7	24	33.14	23	26.4	2
20.6	30.90	17	70.4	27	33.35	21	26.0	4
30.5	31.03	13	73.1	27	33.52	17	25.6	4
une 9.5	31.12	9	75.9	28	33.67	15	25.3	3
19.5	31.17	5	78.6	27	33.77	10	24.9	4
29.4	31.17	0	81.2	26	33.84	7	24.5	4
uly 9.4	31.13	4	83.6	24	33.87	3	24.2	3
19.4	31.06	7	85.8	22	33.86	1	23.9	3
29.4	30.94	12	87.6	18	33.81	5	23.6	3
Aug. 8.3	30.78	16	89.2	16	33.72	9	23.4	2
18.3	30.60	18	90.3	11	33.61	11	23.1	3
28.3	30.40	20	91.1	8	33.47	14	22.9	2
Sept. 7.3	30.18	22	91.4	3	33.31	16	22.7	2
17.2	29.95	23	91.3	1	33.15	16	22.5	2
27.2	29.72	23	90.8	5	32.98	17	22.3	2
Oct. 7.2	29.51	21	89.9	9	32.83	15	22.1	2
17.1	29.32	19	88.5	14	32.71	12	22.0	1
27.1	29.17	15	86.7	18	32.61	10	22.0	0
Nov. 6.1	29.05	12	84.6	21	32.55	6	22.0	0
16.1	28.99	6	82.1	25	32.54	1	22.1	1
26.0	28.97	2	79.4	27	32.57	3	22.4	3
Dec. 6.0	29.01	4	76.4	30	32.66	9	22.8	4
16.0	29.11	10	73.3	31	32.80	14	23.3	5
26.0	29.26	15	70.2	31	32.98	18	23.9	6
35.9	29.46	20	67.1	31	33.20	22	24.6	7
ec δ, Tan δ	1.202		+0.667		1.038		−0.280	
ean Place	$27^s.992$		86″.13		$30^s.075$		13″.99	
$D'_\psi \alpha$, $D_\omega \alpha$	−0.02		+0.01		+0.01		0.00	
$D_\psi \delta$, $D_\omega \delta$	−0.1		−1.0		−0.1		−1.0	

ean Solar Date.	***η* Scorpii.** Mag. 3.4				***ζ* Draconis.** Mag. 3.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 17 6		° ′ −43 7		h m 17 8		° ′ +65 48	
	s		″		s		″	
an. 0.9	2.69		45.8		29.50		53.6	
10.9	3.00	31	45.1	7	29.78	28	50.1	35
20.9	3.36	36	44.6	5	30.15	37	47.0	31
30.9	3.74	38	44.3	3	30.59	44	44.2	28
eb. 9.8	4.15	41	44.2	1	31.09	50	42.0	22
19.8	4.57	42	44.3	1	31.64	55	40.4	16
ar. 1.8	4.99	42	44.6	3	32.21	57	39.4	10
11.7	5.41	42	45.0	4	32.79	58	39.1	3
21.7	5.82	41	45.5	5	33.37	58	39.5	4
31.7	6.22	40	46.2	7	33.91	54	40.5	10
pr. 10.7	6.60	38	47.0	8	34.41	50	42.2	17
20.6	6.96	36	47.9	9	34.86	45	44.4	22
30.6	7.29	33	48.9	10	35.24	38	47.0	26
ay 10.6	7.59	30	50.0	11	35.55	31	49.9	29
20.6	7.85	26	51.2	12	35.77	22	53.1	32
30.5	8.08	23	52.4	12	35.91	14	56.5	34
une 9.5	8.26	18	53.6	12	35.95	4	59.9	34
19.5	8.39	13	54.9	13	35.91	4	63.2	33
29.4	8.47	8	56.1	12	35.78	13	66.3	31
uly 9.4	8.50	3	57.2	11	35.56	22	69.3	30
19.4	8.48	2	58.3	11	35.27	29	71.9	26
29.4	8.41	7	59.2	9	34.90	37	74.1	22
Aug. 8.3	8.29	12	59.9	7	34.47	43	75.9	18
18.3	8.13	16	60.4	5	33.99	48	77.3	14
28.3	7.94	19	60.7	3	33.47	52	78.2	9
Sept. 7.3	7.73	21	60.8	1	32.93	54	78.6	4
17.2	7.51	22	60.6	2	32.37	56	78.4	2
27.2	7.28	23	60.1	5	31.82	55	77.7	7
Oct. 7.2	7.08	20	59.4	7	31.28	54	76.5	12
17.1	6.90	18	58.5	9	30.79	49	74.8	17
27.1	6.77	13	57.3	12	30.35	44	72.6	22
Nov. 6.1	6.68	9	56.1	12	29.97	38	70.0	26
16.1	6.66	2	54.7	14	29.68	29	67.0	30
26.0	6.70	4	53.4	13	29.48	20	63.7	33
Dec. 6.0	6.81	11	52.1	13	29.38	10	60.2	35
16.0	6.98	17	50.9	12	29.39	1	56.6	36
26.0	7.21	23	49.8	11	29.50	11	52.9	37
35.9	7.50	29	49.0	8	29.72	22	49.3	36
ec δ, Tan δ	1.370		−0.937		2.441		+2.227	
ean Place	$3^s.734$		42″.20		$32^s.305$		69″.16	
$D'_\psi \alpha$, $D_\omega \alpha$	+0.02		−0.01		−0.06		+0.03	
$D_\psi \delta$, $D_\omega \delta$	−0.1		−1.0		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**α Herculis.** Var. 3.1–3.9				**δ Herculis.** Mag. 3.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′	
	17 10		+14 28		17 11		+24 55	
	s		″		s		″	
Jan. 0.9	45.48		59.7		31.47		67.0	
10.9	45.70	22	57.4	23	31.68	21	64.2	28
20.9	45.94	24	55.3	21	31.93	25	61.7	25
30.9	46.21	27	53.3	20	32.21	28	59.4	23
Feb. 9.8	46.50	29	51.6	17	32.50	29	57.5	19
19.8	46.80	30	50.3	13	32.81	31	56.0	15
Mar. 1.8	47.11	31	49.4	9	33.13	32	55.0	10
11.7	47.42	31	48.9	5	33.44	31	54.5	5
21.7	47.72	30	48.9	0	33.75	31	54.6	1
31.7	48.01	29	49.3	4	34.05	30	55.1	5
Apr. 10.7	48.28	27	50.1	8	34.34	29	56.2	11
20.6	48.54	26	51.2	11	34.60	26	57.6	14
30.6	48.78	24	52.7	15	34.84	24	59.5	19
May 10.6	48.99	21	54.4	17	35.05	21	61.6	21
20.6	49.17	18	56.3	19	35.23	18	63.9	23
30.5	49.33	16	58.3	20	35.38	15	66.3	24
June 9.5	49.45	12	60.3	20	35.50	12	68.8	25
19.5	49.53	8	62.3	20	35.57	7	71.3	25
29.4	49.58	5	64.2	19	35.60	3	73.6	23
July 9.4	49.58	0	66.1	19	35.60	0	75.8	22
19.4	49.55	3	67.7	16	35.55	5	77.8	20
29.4	49.49	6	69.1	14	35.46	9	79.6	18
Aug. 8.3	49.39	10	70.3	12	35.34	12	81.1	15
18.3	49.26	13	71.3	10	35.19	15	82.2	11
28.3	49.10	16	72.0	7	35.02	17	83.0	8
Sept. 7.3	48.93	17	72.4	4	34.83	19	83.5	5
17.2	48.76	17	72.5	1	34.63	20	83.5	0
27.2	48.58	18	72.3	2	34.43	20	83.2	3
Oct. 7.2	48.41	17	71.9	4	34.23	20	82.6	6
17.1	48.26	15	71.1	8	34.06	17	81.5	11
27.1	48.14	12	70.0	11	33.92	14	80.1	14
Nov. 6.1	48.06	8	68.6	14	33.82	10	78.3	18
16.1	48.02	4	67.0	16	33.76	6	76.2	21
26.0	48.02	0	65.1	19	33.75	1	73.9	23
Dec. 6.0	48.08	6	63.0	21	33.79	4	71.4	25
16.0	48.18	10	60.8	22	33.88	9	68.7	27
26.0	48.33	15	58.5	23	34.02	14	65.9	28
35.9	48.52	19	56.2	23	34.21	19	63.1	28
Sec δ, Tan δ	1.033		+0.258		1.103		+0.465	
Mean Place	46ˢ.261		70″.94		32ˢ.370		79″.33	
D′ψ a, Dω a	−0.01		0.00		−0.01		+0.01	
Dψ δ, Dω δ	−0.1		−1.0		−0.1		−1.0	

Mean Solar Date.	**π Herculis.** Mag. 3.4				**59 Apodis (G.).** Mag. 5.9		
	Right Ascension.		Declination N.		Right Ascension.		Declination S
	h m		° ′		h m		°
	17 12		+36 53		17 15		−80 4
	s		″		s		″
Jan. 0.9	4.01		61.9		26.05		59.9
10.9	4.22	21	58.8	31	27.13	108	57.4
20.9	4.48	26	56.0	28	28.40	127	55.2
30.9	4.77	29	53.5	25	29.83	143	53.4
Feb. 9.8	5.08	31	51.3	22	31.39	156	52.1
19.8	5.41	33	49.7	16	33.05	166	51.3
Mar. 1.8	5.75	34	48.7	10	34.75	170	50.9
11.7	6.10	35	48.2	5	36.47	172	51.0
21.7	6.44	34	48.4	2	38.17	170	51.5
31.7	6.76	32	49.1	7	39.82	165	52.4
Apr. 10.7	7.07	31	50.4	13	41.39	157	53.8
20.6	7.35	28	52.1	17	42.85	146	55.5
30.6	7.60	25	54.3	22	44.18	133	57.6
May 10.6	7.82	22	56.8	25	45.35	117	59.9
20.6	8.01	19	59.5	27	46.34	99	62.5
30.5	8.15	14	62.3	28	47.13	79	65.2
June 9.5	8.25	10	65.3	30	47.70	57	68.1
19.5	8.31	6	68.2	29	48.04	34	71.0
29.4	8.32	1	70.9	27	48.16	12	73.9
July 9.4	8.29	3	73.5	26	48.03	13	76.7
19.4	8.21	8	75.8	23	47.68	35	79.3
29.4	8.09	12	77.9	21	47.11	57	81.6
Aug. 8.3	7.93	16	79.6	17	46.35	76	83.5
18.3	7.74	19	80.9	13	45.41	94	85.0
28.3	7.53	21	81.8	9	44.35	106	86.1
Sept. 7.3	7.29	24	82.3	5	43.19	116	86.7
17.2	7.05	24	82.3	0	41.99	120	86.6
27.2	6.81	24	81.9	4	40.80	119	86.1
Oct. 7.2	6.58	23	81.0	9	39.68	112	84.9
17.1	6.37	21	79.7	13	38.66	102	83.3
27.1	6.19	18	78.0	17	37.80	86	81.2
Nov. 6.1	6.05	14	75.9	21	37.15	65	78.7
16.1	5.96	9	73.4	25	36.74	41	75.9
26.0	5.92	4	70.7	27	36.59	15	73.0
Dec. 6.0	5.94	2	67.7	30	36.71	12	69.9
16.0	6.02	8	64.5	32	37.12	41	66.8
26.0	6.15	13	61.3	32	37.79	67	63.9
35.9	6.33	18	58.2	31	38.71	92	61.2
Sec δ, Tan δ	1.251		+0.751		6.245		−6.164
Mean Place	5ˢ.139		75″.46		32ˢ.567		58″.79
D′ψ a, Dω a	−0.02		+0.01		+0.16		−0.08
Dψ δ, Dω δ	−0.1		−1.0		−0.1		−1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**θ Ophiuchi.** Mag. 3.4				**w Herculis.** Mag. 5.4				**β Aræ.** Mag. 2.8				**b Ophiuchi.** Mag. 4.3			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 17 16		° ′ −24 54		h m 17 17		° ′ +32 34		h m 17 18		° ′ −55 27		h m 17 21		° ′ −24 5	
	s		″		s		″		s		″		s		″	
an. 0.9	46.48		62.8		27.63		21.9		12.38		5.5		9.85		60.1	
10.9	46.73	25	63.0	2	27.83	20	18.9	30	12.75	37	4.0	15	10.10	25	60.3	2
20.9	47.01	28	63.3	3	28.08	25	16.1	28	13.17	42	2.8	12	10.38	28	60.6	3
30.9	47.32	31	63.7	4	28.36	28	13.6	25	13.64	47	1.8	10	10.68	30	61.0	4
eb. 9.8	47.65	33	64.1	4	28.66	30	11.5	21	14.13	49	1.2	6	11.00	32	61.4	4
19.8	47.99	34	64.5	4	28.98	32	9.9	16	14.65	52	0.8	4	11.34	34	61.9	5
ar. 1.8	48.34	35	64.9	4	29.31	33	8.8	11	15.17	52	0.7	1	11.68	34	62.3	4
11.8	48.68	34	65.3	4	29.64	33	8.3	5	15.70	53	0.9	2	12.02	34	62.6	3
21.7	49.02	34	65.7	4	29.97	33	8.3	0	16.22	52	1.4	5	12.35	33	62.9	3
31.7	49.34	32	65.9	2	30.28	31	8.9	6	16.72	50	2.1	7	12.68	33	63.2	3
pr. 10.7	49.66	32	66.2	3	30.58	30	10.1	12	17.21	49	3.0	9	13.00	32	63.3	1
20.6	49.96	30	66.4	2	30.86	28	11.7	16	17.67	46	4.1	11	13.30	30	63.4	1
30.6	50.24	28	66.5	1	31.11	25	13.7	20	18.10	43	5.5	14	13.58	28	63.5	1
ay 10.6	50.49	25	66.6	1	31.33	22	16.0	23	18.48	38	7.0	15	13.84	26	63.6	1
20.6	50.72	23	66.7	1	31.52	19	18.6	26	18.82	34	8.6	16	14.07	23	63.6	0
30.5	50.92	20	66.9	2	31 67	15	21.3	27	19.11	29	10.3	17	14.27	20	63.7	1
une 9.5	51.08	16	67.0	1	31.78	11	24.0	27	19.34	23	12.1	18	14.43	16	63.8	1
19.5	51.21	13	67.1	1	31.85	7	26.8	28	19.51	17	14.0	19	14.56	13	63.8	0
29.5	51.29	8	67.3	2	31.88	3	29.4	26	19.62	11	15.8	18	14.65	9	63.9	1
uly 9.4	51.33	4	67.4	1	31.86	2	31.9	25	19.65	3	17.6	18	14.70	5	64.0	1
19.4	51.33	0	67.6	2	31.80	6	34.1	22	19.62	3	19.2	16	14.70	0	64.2	2
29.4	51.29	4	67.8	2	31.70	10	36.1	20	19.52	10	20.7	15	14.66	4	64.3	1
Aug. 8.3	51.21	8	67.9	1	31.57	13	37.7	16	19.37	15	21.9	12	14.58	8	64.4	1
18.3	51.09	12	67.9	0	31.40	17	39.0	13	19.16	21	22.9	10	14.47	11	64.4	0
28.3	50.95	14	67.9	0	31.20	20	39.9	9	18.90	26	23.5	6	14.33	14	64.4	0
Sept. 7.3	50.79	16	67.8	1	30.99	21	40.4	5	18.62	28	23.8	3	14.17	16	64.3	1
17.2	50.61	18	67.7	1	30.76	23	40.5	1	18.32	30	23.8	0	13.99	18	64.2	1
27.2	50.44	17	67.4	3	30.54	22	40.1	4	18.02	30	23.3	5	13.82	17	64.0	2
Oct. 7.2	50.27	17	67.1	3	30.32	22	39.4	7	17.74	28	22.5	8	13.65	17	63.7	3
17.2	50.13	14	66.7	4	30.12	20	38.2	12	17.49	25	21.3	12	13.51	14	63.4	3
27.1	50.02	11	66.3	4	29.96	16	36.6	16	17.29	20	19.9	14	13.40	11	63.0	4
Nov. 6.1	49.95	7	65.9	4	29.83	13	34.6	20	17.15	14	18.2	17	13.33	7	62.7	3
16.1	49.93	2	65.5	4	29.75	8	32.3	23	17.09	6	16.3	19	13.30	3	62.4	3
26.0	49.95	2	65.2	3	29.72	3	29.7	26	17.10	1	14.3	20	13.32	2	62.1	3
Dec. 6.0	50.04	9	65.0	2	29.74	2	26.8	29	17.20	10	12.3	20	13.40	8	61.9	2
16.0	50.17	13	64.9	1	29.81	7	23.8	30	17.38	18	10.4	19	13.53	13	61.8	1
26.0	50.35	18	64.9	0	29.94	13	20.7	31	17.63	25	8.6	18	13.70	17	61.9	1
35.9	50.58	23	65.0	1	30.12	18	17.7	30	17.96	33	6.9	17	13.92	22	62.0	1
Sec δ, Tan δ	1.103		−0.465		1.187		+0.639		1.763		−1.452		1.096		−0.447	
Mean Place	47ˢ.257		56″.56		28ˢ.680		34″.77		13ˢ.862		2″.48		10ˢ.626		53″.66	
$D'_\psi a$, $D_\omega a$	+0.01		−0.01		−0.02		+0.01		+0.04		−0.02		+0.01		−0.01	
$D_\psi \delta$, $D_\omega \delta$	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	σ Ophiuchi. Mag. 4.4 Right Ascension.		σ Ophiuchi. Mag. 4.4 Declination N.		δ Aræ. Mag. 3.8 Right Ascension.		δ Aræ. Mag. 3.8 Declination S.		α Aræ. Mag. 3.0 Right Ascension.		α Aræ. Mag. 3.0 Declination S.		λ Herculis. Mag. 4.5 Right Ascension.		λ Herculis. Mag. 4.5 Declination N.
	h m 17 22		° ′ + 4 12		h m 17 23		° ′ −60 36		h m 17 25		° ′ −49 48		h m 17 27		° +26 1
	s		″		s		″		s		″		s		″
Jan. 0.9	17.06		38.7		23.44		55.3		14.86		39.9		17.21		14.7
10.9	17.27	21	36.9	18	23.85	41	53.6	17	15.18	32	38.7	12	17.40	19	11.9
20.9	17.51	24	35.2	17	24.31	46	52.1	15	15.55	37	37.6	11	17.63	23	9.3
30.9	17.78	27	33.6	16	24.83	52	50.9	12	15.96	41	36.8	8	17.90	27	7.0
Feb. 9.8	18.06	28	32.2	14	25.39	56	50.0	9	16.40	44	36.3	5	18.19	29	5.0
19.8	18.36	30	31.1	11	25.97	58	49.4	6	16.86	46	36.0	3	18.49	30	3.4
Mar. 1.8	18.66	30	30.3	8	26.56	59	49.1	3	17.32	46	35.9	1	18.80	31	2.3
11.8	18.97	31	29.8	5	27.16	60	49.2	1	17.79	47	36.0	1	19.12	32	1.8
21.7	19.27	30	29.7	1	27.76	60	49.6	4	18.25	46	36.3	3	19.44	32	1.8
31.7	19.56	29	29.9	2	28.34	58	50.3	7	18.71	46	36.9	6	19.74	30	2.3
Apr. 10.7	19.84	28	30.4	5	28.90	56	51.3	10	19.14	43	37.6	7	20.03	29	3.3
20.6	20.10	26	31.2	8	29.43	53	52.5	12	19.56	42	38.5	9	20.31	28	4.7
30.6	20.35	25	32.3	11	29.92	49	53.9	14	19.95	39	39.6	11	20.56	25	6.6
May 10.6	20.57	22	33.6	13	30.36	44	55.6	17	20.30	35	40.8	12	20.79	23	8.7
20.6	20.77	20	35.1	15	30.75	39	57.4	18	20.62	32	42.1	13	20.99	20	11.1
30.5	20.94	17	36.6	15	31.08	33	59.3	19	20.89	27	43.5	14	21.15	16	13.6
June 9.5	21.08	14	38.1	15	31.35	27	61.4	21	21.11	22	45.0	15	21.28	13	16.2
19.5	21.19	11	39.7	16	31.54	19	63.5	21	21.28	17	46.5	15	21.36	8	18.7
29.5	21.26	7	41.2	15	31.65	11	65.6	21	21.39	11	48.1	16	21.41	5	21.2
July 9.4	21.28	2	42.5	13	31.69	4	67.6	20	21.44	5	49.6	15	21.41	0	23.6
19.4	21.28	0	43.8	13	31.65	4	69.4	18	21.43	1	51.0	14	21.38	3	25.7
29.4	21.23	5	44.9	11	31.53	12	71.1	17	21.36	7	52.3	13	21.30	8	27.6
Aug. 8.3	21.15	8	45.9	10	31.35	18	72.6	15	21.24	12	53.4	11	21.19	11	29.2
18.3	21.04	11	46.6	7	31.10	25	73.7	11	21.06	18	54.2	8	21.04	15	30.5
28.3	20.90	14	47.2	6	30.80	30	74.5	8	20.85	21	54.8	6	20.87	17	31.5
Sept. 7.3	20.74	16	47.6	4	30.47	33	74.9	4	20.61	24	55.1	3	20.68	19	32.1
17.2	20.57	17	47.8	2	30.12	35	74.9	0	20.35	26	55.1	0	20.47	21	32.3
27.2	20.40	17	47.8	0	29.76	36	74.5	4	20.09	26	54.7	4	20.27	20	32.1
Oct. 7.2	20.24	16	47.5	3	29.42	34	73.7	8	19.85	24	54.0	7	20.07	20	31.5
17.2	20.10	14	47.1	4	29.12	30	72.5	12	19.63	22	53.1	9	19.89	18	30.6
27.1	19.99	11	46.4	7	28.88	24	70.9	16	19.45	18	51.8	13	19.73	16	29.3
Nov. 6.1	19.91	8	45.5	9	28.70	18	69.1	18	19.33	12	50.4	14	19.61	12	27.6
16.1	19.87	4	44.4	11	28.61	9	67.0	21	19.27	6	48.8	16	19.54	7	25.6
26.0	19.88	1	43.1	13	28.60	1	64.8	22	19.28	1	47.1	17	19.51	3	23.3
Dec. 6.0	19.93	5	41.6	15	28.69	9	62.5	23	19.36	8	45.4	17	19.53	2	20.8
16.0	20.03	10	39.9	17	28.87	18	60.3	22	19.52	16	43.8	16	19.61	8	18.1
26.0	20.18	15	38.2	17	29.14	27	58.2	21	19.74	22	42.2	16	19.73	12	15.3
35.9	20.37	19	36.4	18	29.50	36	56.3	19	20.03	29	40.8	14	19.90	17	12.5
Sec δ, Tan δ	1.003		+0.074		2.038		−1.776		1.550		−1.184		1.114		+0.401
Mean Place	17ˢ.802		48″.44		25ˢ.226		52″.45		16ˢ.107		36″.01		18ˢ.174		26″.42
$D'_\psi a$, $D_\omega a$	0.00		0.00		+0.05		−0.02		+0.03		−0.01		−0.01		0.00
$D'_\psi \delta$, $D_\omega \delta$	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		−0.1		−1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**λ Scorpii.** Mag. 1.7				**β Draconis.** Mag. 3.0				**α Ophiuchi.** Mag. 2.1				**ξ Serpentis.** Mag. 3.6			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 17 27 s		° ′ −37 2 ″		h m 17 28 s		° ′ +52 21 ″		h m 17 30 s		° ′ +12 36 ″		h m 17 32 s		° ′ −15 20 ″	
an. 1.0	49.15		39.2		28.89		36.5		58.47		65.2		42.33		52.7	
10.9	49.42	27	38.6	6	29.09	20	33.1	34	58.67	20	63.0	22	42.55	22	53.4	7
20.9	49.73	31	38.2	4	29.35	26	29.9	32	58.90	23	61.0	20	42.81	26	54.1	7
30.9	50.07	34	38.0	2	29.67	32	27.1	28	59.16	26	59.1	19	43.09	28	54.8	7
eb. 9.8	50.43	36	37.8	2	30.03	36	24.7	24	59.44	28	57.4	17	43.39	30	55.5	7
19.8	50.81	38	37.8	0	30.41	38	22.8	19	59.73	29	56.1	13	43.70	31	56.1	6
ar. 1.8	51.20	39	37.9	1	30.82	41	21.6	12	60.03	30	55.2	9	44.02	32	56.5	4
11.8	51.58	38	38.1	2	31.24	42	21.1	5	60.34	31	54.7	5	44.34	32	56.9	4
21.7	51.96	38	38.4	3	31.65	41	21.1	0	60.64	30	54.6	1	44.66	32	57.1	2
31.7	52.34	38	38.8	4	32.05	40	21.9	8	60.93	29	54.9	3	44.97	31	57.1	0
pr. 10.7	52.70	36	39.2	4	32.44	39	23.2	13	61.22	29	55.6	7	45.27	30	57.0	1
20.7	53.04	34	39.7	5	32.79	35	25.1	19	61.49	27	56.7	11	45.56	29	56.7	3
30.6	53.37	33	40.2	5	33.10	31	27.5	24	61.74	25	58.1	14	45.83	27	56.4	3
ay 10.6	53.67	30	40.8	6	33.37	27	30.2	27	61.97	23	59.7	16	46.08	25	55.9	5
20.6	53.93	26	41.5	7	33.59	22	33.3	31	62.17	20	61.5	18	46.31	23	55.4	5
30.5	54.17	24	42.2	7	33.75	16	36.5	32	62.34	17	63.5	20	46.51	20	54.9	5
une 9.5	54.36	19	43.0	8	33.86	11	39.8	33	62.48	14	65.5	20	46.67	16	54.5	4
19.5	54.51	15	43.9	9	33.91	5	43.1	33	62.58	10	67.5	20	46.81	14	54.0	5
29.5	54.61	10	44.7	8	33.89	2	46.2	31	62.65	7	69.4	19	46.90	9	53.6	4
uly 9.4	54.67	6	45.5	8	33.82	7	49.2	30	62.68	3	71.2	18	46.95	5	53.2	4
19.4	54.68	1	46.3	8	33.69	13	52.0	28	62.67	1	72.8	16	46.96	1	52.8	4
29.4	54.63	5	47.0	7	33.51	18	54.4	24	62.62	5	74.3	15	46.93	3	52.5	3
ug. 8.4	54.55	8	47.6	6	33.28	23	56.5	21	62.53	9	75.6	13	46.86	7	52.3	2
18.3	54.42	13	48.1	5	33.00	28	58.1	16	62.41	12	76.6	10	46.76	10	52.1	2
28.3	54.26	16	48.4	3	32.69	31	59.3	12	62.27	14	77.4	8	46.63	13	51.9	2
ept. 7.3	54.07	19	48.6	2	32.36	33	59.9	6	62.11	16	77.9	5	46.48	15	51.8	1
17.2	53.87	20	48.5	1	32.01	35	60.1	2	61.93	18	78.1	2	46.32	16	51.6	2
27.2	53.67	20	48.2	3	31.66	35	59.8	3	61.75	18	78.0	1	46.15	17	51.5	1
ct. 7.2	53.47	20	47.8	4	31.32	34	59.0	8	61.58	17	77.7	3	45.99	16	51.4	1
17.2	53.30	17	47.1	7	31.00	32	57.7	13	61.43	15	77.0	7	45.85	14	51.4	0
27.1	53.16	14	46.3	8	30.72	28	55.9	18	61.30	13	76.1	9	45.73	12	51.3	1
Nov. 6.1	53.07	9	45.4	9	30.48	24	53.6	23	61.20	10	74.9	12	45.65	8	51.4	1
16.1	53.03	4	44.4	10	30.30	18	50.9	27	61.15	5	73.4	15	45.61	4	51.5	1
26.1	53.04	1	43.4	10	30.18	12	47.9	30	61.14	1	71.7	17	45.62	1	51.7	2
Dec. 6.0	53.12	8	42.5	9	30.13	5	44.6	33	61.18	4	69.8	19	45.68	6	52.1	4
16.0	53.26	14	41.6	9	30.15	2	41.2	34	61.26	8	67.7	21	45.79	11	52.5	4
26.0	53.45	19	40.8	8	30.24	9	37.7	35	61.39	13	65.6	21	45.95	16	53.1	6
35.9	53.69	24	40.1	7	30.41	17	34.2	35	61.57	18	63.4	22	46.15	20	53.7	6
ec δ, Tan δ	1.253		−0.755		1.638		+1.297		1.025		+0.224		1.037		−0.274	
ean Place	$50^{s}.090$		$33''.95$		$30^{s}.684$		$49''.93$		$59^{s}.290$		$75''.66$		$43^{s}.076$		$45''.12$	
ψa, $D_\omega a$	+0.02		−0.01		−0.03		+0.01		−0.01		0.00		+0.01		0.00	
$\psi \delta$, $D_\omega \delta$	−0.1		−1.0		−0.1		−1.0		−0.1		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Herculis. Mag. 3.8 Right Ascension.		ι Herculis. Mag. 3.8 Declination N.		η Pavonis. Mag. 3.6 Right Ascension.		η Pavonis. Mag. 3.6 Declination S.		ω Draconis. Mag. 4.9 Right Ascension.		ω Draconis. Mag. 4.9 Declination N.		β Ophiuchi. Mag. 2.9 Right Ascension.		β Ophiuchi. Mag. 2.9 Declin- tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	17 37		+46 2		17 37		−64 41		17 37		+68 47		17 39		+ 4
	s		″		s		″		s		″		s		
Jan. 1.0	2.41	18	51.3	33	21.05	42	8.5	21	23.27	22	37.2	35	15.61	20	57.6
10.9	2.59	24	48.0	31	21.47	50	6.4	18	23.49	33	33.7	33	15.81	23	55.9
20.9	2.83	29	44.9	28	21.97	56	4.6	16	23.82	43	30.4	29	16.04	25	54.2
30.9	3.12	32	42.1	24	22.53	61	3.0	12	24.25	51	27.5	25	16.29	27	52.6
Feb. 9.8	3.44	35	39.7	19	23.14	65	1.8	8	24.76	57	25.0	19	16.56	29	51.2
19.8	3.79	36	37.8	12	23.79	67	1.0	5	25.33	61	23.1	13	16.85	30	50.1
Mar. 1.8	4.15	38	36.6	7	24.46	68	0.5	2	25.94	64	21.8	6	17.15	30	49.3
11.8	4.53	38	35.9	0	25.14	67	0.3	1	26.58	65	21.2	0	17.45	30	48.9
21.7	4.91	36	35.9	6	25.81	67	0.4	5	27.23	63	21.2	7	17.75	30	48.8
31.7	5.27	35	36.5	12	26.48	64	0.9	9	27.86	59	21.9	14	18.05	28	49.0
Apr. 10.7	5.62	33	37.7	18	27.12	62	1.8	11	28.45	54	23.3	19	18.33	28	49.6
20.7	5.95	30	39.5	22	27.74	57	2.9	13	28.99	47	25.2	24	18.61	25	50.4
30.6	6.25	26	41.7	26	28.31	52	4.2	17	29.46	40	27.6	28	18.86	24	51.6
May 10.6	6.51	22	44.3	29	28.83	46	5.9	18	29.86	30	30.4	32	19.10	21	52.9
20.6	6.73	17	47.2	31	29.29	40	7.7	20	30.16	21	33.6	33	19.31	19	54.4
30.5	6.90	12	50.3	32	29.69	32	9.7	22	30.37	11	36.9	34	19.50	15	56.0
June 9.5	7.02	8	53.5	32	30.01	24	11.9	22	30.48	1	40.3	34	19.65	12	57.6
19.5	7.10	2	56.7	31	30.25	15	14.1	23	30.49	10	43.7	33	19.77	8	59.2
29.5	7.12	4	59.8	30	30.40	6	16.4	22	30.39	20	47.0	32	19.85	5	60.8
July 9.4	7.08	9	62.8	27	30.46	4	18.6	21	30.19	29	50.2	29	19.90	0	62.3
19.4	6.99	13	65.5	24	30.42	12	20.7	19	29.90	38	53.1	26	19.90	3	63.6
29.4	6.86	18	67.9	21	30.30	20	22.6	17	29.52	46	55.7	22	19.87	8	64.8
Aug. 8.4	6.68	23	70.0	17	30.10	28	24.3	14	29.06	53	57.9	18	19.79	10	65.9
18.3	6.45	25	71.7	12	29.82	34	25.7	10	28.53	58	59.7	13	19.69	13	66.7
28.3	6.20	28	72.9	8	29.48	38	26.7	6	27.95	62	61.0	8	19.56	16	67.3
Sept. 7.3	5.92	30	73.7	3	29.10	41	27.3	2	27.33	64	61.8	3	19.40	16	67.8
17.2	5.62	30	74.0	1	28.69	41	27.5	3	26.69	65	62.1	2	19.24	17	68.0
27.2	5.32	29	73.9	7	28.28	41	27.2	7	26.04	64	61.9	8	19.07	17	68.1
Oct. 7.2	5.03	27	73.2	12	27.87	37	26.5	12	25.40	60	61.1	13	18.90	15	67.9
17.2	4.76	24	72.0	16	27.50	31	25.3	15	24.80	56	59.8	18	18.75	12	67.5
27.1	4.52	20	70.4	21	27.19	23	23.8	19	24.24	49	58.0	22	18.63	9	66.8
Nov. 6.1	4.32	16	68.3	24	26.96	15	21.9	22	23.75	40	55.8	27	18.54	6	66.0
16.1	4.16	9	65.9	29	26.81	5	19.7	23	23.35	31	53.1	31	18.48	1	64.9
26.1	4.07	4	63.0	31	26.76	6	17.4	24	23.04	21	50.0	33	18.47	4	63.6
Dec. 6.0	4.03	3	59.9	33	26.82	17	15.0	25	22.83	8	46.7	35	18.51	9	62.2
16.0	4.06	8	56.6	34	26.99	26	12.5	24	22.75	3	43.2	36	18.60	13	60.6
26.0	4.14	16	53.2	33	27.25	37	10.1	22	22.78	14	39.6	36	18.73	17	58.9
35.9	4.30		49.9		27.62		7.9		22.92		36.0		18.90		57.1
Sec δ, Tan δ	1.441		+1.037		2.339		−2.114		2.765		+2.577		1.003		+0.080
Mean Place	$3^{s}.939$		$63''.81$		$23^{s}.156$		$4''.97$		$26^{s}.848$		$50''.32$		$16^{s}.387$		$67''.10$
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.03		+0.01		+0.05		−0.01		−0.07		+0.02		0.00		0.00
$D_{\psi}\delta$, $D_{\omega}\delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	ι^1 Scorpii. Mag. 3.1				μ Herculis. Mag. 3.5				ψ Draconis. Mag. 4.9				γ Ophiuchi. Mag. 3.7			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 41		−40 5		17 43		+27 45		17 43		+72 10		17 43		+ 2 44	
	s		″		s		″		s		″		s		″	
n. 1.0	37.37	26	48.1	9	6.83	18	59.8	28	22.39	22	74.6	36	37.02	20	9.1	16
10.9	37.63	31	47.2	7	7.01	22	57.0	27	22.61	35	71.0	33	37.22	23	7.5	16
20.9	37.94	34	46.5	5	7.23	25	54.3	24	22.96	47	67.7	29	37.45	25	5.9	15
30.9	38.28	37	46.0	4	7.48	28	51.9	21	23.43	57	64.8	25	37.70	27	4.4	13
b. 9.9	38.65	38	45.6	2	7.76	30	49.8	17	24.00	64	62.3	20	37.97	29	3.1	10
19.8	39.03	39	45.4	1	8.06	31	48.1	12	24.64	71	60.3	14	38.26	29	2.1	8
ar. 1.8	39.42	40	45.3	0	8.37	32	46.9	6	25.35	74	58.9	7	38.55	31	1.3	5
11.8	39.82	40	45.3	1	8.69	31	46.3	1	26.09	75	58.2	0	38.86	30	0.8	1
21.7	40.22	39	45.4	2	9.00	31	46.2	4	26.84	73	58.2	6	39.16	29	0.7	2
31.7	40.61	39	45.6	4	9.31	30	46.6	9	27.57	69	58.8	12	39.45	29	0.9	6
pr. 10.7	41.00	36	46.0	4	9.61	29	47.5	14	28.26	64	60.0	19	39.74	28	1.5	8
20.7	41.36	35	46.4	5	9.90	27	48.9	18	28.90	55	61.9	23	40.02	26	2.3	11
30.6	41.71	32	46.9	7	10.17	24	50.7	21	29.45	46	64.2	28	40.28	24	3.4	12
ay 10.6	42.03	29	47.6	7	10.41	21	52.8	24	29.91	36	67.0	31	40.52	21	4.6	14
20.6	42.32	26	48.3	8	10.62	17	55.2	26	30.27	24	70.1	32	40.73	19	6.0	15
30.6	42.58	22	49.1	9	10.79	14	57.8	27	30.51	12	73.3	34	40.92	16	7.5	16
une 9.5	42.80	17	50.0	9	10.93	11	60.5	26	30.63	0	76.7	35	41.08	13	9.1	15
19.5	42.97	12	50.9	10	11.04	6	63.1	26	30.63	12	80.2	33	41.21	9	10.6	15
29.5	43.09	7	51.9	10	11.10	1	65.7	25	30.51	24	83.5	31	41.30	5	12.1	14
uly 9.4	43.16	2	52.9	10	11.11	2	68.2	22	30.27	35	86.6	30	41.35	1	13.5	12
19.4	43.18	3	53.9	9	11.09	7	70.4	21	29.92	46	89.6	26	41.36	4	14.7	11
29.4	43.15	8	54.8	7	11.02	11	72.5	17	29.46	55	92.2	22	41.32	6	15.8	10
ug. 8.4	43.07	13	55.5	7	10.91	14	74.2	14	28.91	63	94.4	19	41.26	10	16.8	8
18.3	42.94	17	56.2	5	10.77	17	75.6	12	28.28	70	96.3	13	41.16	13	17.6	6
28.3	42.77	19	56.7	3	10.60	20	76.8	7	27.58	74	97.6	9	41.03	15	18.2	5
ept. 7.3	42.58	21	57.0	0	10.40	21	77.5	3	26.84	77	98.5	4	40.88	17	18.7	2
17.3	42.37	21	57.0	2	10.19	21	77.8	1	26.07	78	98.9	2	40.71	17	18.9	0
27.2	42.16	21	56.8	4	9.98	21	77.7	4	25.29	77	98.7	7	40.54	16	18.9	1
ct. 7.2	41.95	19	56.4	6	9.77	19	77.3	9	24.52	74	98.0	12	40.38	15	18.8	4
17.2	41.76	15	55.8	8	9.58	17	76.4	13	23.78	68	96.8	17	40.23	13	18.4	6
27.1	41.61	11	55.0	10	9.41	13	75.1	16	23.10	61	95.1	22	40.10	9	17.8	7
ov. 6.1	41.50	6	54.0	11	9.28	10	73.5	20	22.49	52	92.9	26	40.01	6	17.1	10
16.1	41.44	0	52.9	12	9.18	5	71.5	23	21.97	40	90.3	30	39.95	1	16.1	12
26.1	41.44	6	51.7	11	9.13	1	69.2	25	21.57	28	87.3	33	39.94	4	14.9	13
Dec. 6.0	41.50	12	50.6	11	9.14	5	66.7	27	21.29	15	84.0	35	39.98	8	13.6	15
16.0	41.62	18	49.5	11	9.19	10	64.0	28	21.14	1	80.5	36	40.06	13	12.1	16
26.0	41.80	23	48.4	9	9.29	15	61.2	29	21.13	13	76.9	35	40.19	17	10.5	16
35.9	42.03		47.5		9.44		58.3		21.26		73.4		40.36		8.9	
c δ, Tan δ	1.307		−0.842		1.130		+0.527		3.269		+3.112		1.001		+0.048	
ean Place	$38^s.363$		$42''.51$		$7^s.878$		$70''.86$		$26^s.806$		$87''.12$		$37^s.798$		$18''.38$	
$_{\psi}a$, $D_{\omega}\,a$	+0.02		0.00		−0.01		0.00		−0.08		+0.01		0.00		0.00	
$_{\psi}\delta$, $D_{\omega}\,\delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	89 Herculis. Mag. 5.5				ξ Draconis. Mag. 3.9				35 Draconis. Mag. 5.0				θ Herculis. Mag. 4.0		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Decli tion
	h m 17 51		° ′ +26 3		h m 17 52		° ′ +56 52		h m 17 53		° ′ +76 58		h m 17 53		° +37
	s		″		s		″		s		″		s		″
Jan. 1.0	58.43		35.6		1.38		56.9		8.82		17.8		18.97		29.1
10.9	58.60	17	32.9	27	1.55	17	53.4	35	9.03	21	14.4	34	19.14	17	26.0
20.9	58.81	21	30.3	26	1.79	24	50.1	33	9.42	39	11.1	33	19.35	21	23.1
30.9	59.06	25	27.9	24	2.09	30	47.1	30	9.98	56	8.1	30	19.60	25	20.4
Feb. 9.9	59.33	27	25.9	20	2.45	36	44.5	26	10.68	70	5.5	26	19.88	28	18.1
19.8	59.62	29	24.3	16	2.85	40	42.4	21	11.51	83	3.5	20	20.19	31	16.2
Mar. 1.8	59.93	31	23.1	12	3.28	43	41.0	14	12.42	91	2.0	15	20.52	33	14.9
11.8	60.24	31	22.4	7	3.72	44	40.2	8	13.39	97	1.2	8	20.86	34	14.1
21.7	60.55	31	22.2	2	4.18	46	40.0	2	14.38	99	1.1	1	21.20	34	14.0
31.7	60.86	31	22.6	4	4.63	45	40.5	5	15.35	97	1.6	5	21.53	33	14.4
Apr. 10.7	61.16	30	23.5	9	5.06	43	41.7	12	16.28	93	2.7	11	21.86	33	15.4
20.7	61.45	29	24.9	14	5.46	40	43.4	17	17.13	85	4.5	18	22.17	31	16.9
30.6	61.72	27	26.7	18	5.82	36	45.7	23	17.88	75	6.7	22	22.46	29	18.9
May 10.6	61.97	25	28.7	20	6.14	32	48.4	27	18.50	62	9.4	27	22.72	26	21.3
20.6	62.19	22	31.1	24	6.41	27	51.4	30	18.98	48	12.4	30	22.94	22	24.0
30.6	62.38	19	33.6	25	6.61	20	54.6	32	19.31	33	15.7	33	23.13	19	26.8
June 9.5	62.53	15	36.2	26	6.76	15	58.0	34	19.47	16	19.0	33	23.28	15	29.8
19.5	62.64	11	38.9	27	6.83	7	61.4	34	19.46	1	22.4	34	23.38	10	32.9
29.5	62.71	7	41.5	26	6.84	1	64.7	33	19.29	17	25.8	34	23.44	6	35.8
July 9.4	62.74	3	43.9	24	6.78	6	67.9	32	18.96	33	29.0	32	23.45	1	38.7
19.4	62.73	1	46.2	23	6.65	13	70.9	30	18.47	49	32.0	30	23.41	4	41.3
29.4	62.67	6	48.3	21	6.46	19	73.6	27	17.84	63	34.7	27	23.33	8	43.7
Aug. 8.4	62.57	10	50.1	18	6.21	25	75.9	23	17.08	76	37.0	23	23.20	13	45.8
18.3	62.44	13	51.5	14	5.91	30	77.9	20	16.21	87	39.0	20	23.03	17	47.5
28.3	62.28	16	52.7	12	5.57	34	79.4	15	15.25	96	40.5	15	22.83	20	48.8
Sept. 7.3	62.09	19	53.5	8	5.20	37	80.4	10	14.23	102	41.5	10	22.60	23	49.8
17.3	61.89	20	53.9	4	4.80	40	80.9	5	13.16	107	42.0	5	22.36	24	50.3
27.2	61.68	21	53.9	0	4.40	40	80.9	0	12.07	109	42.0	0	22.11	25	50.3
Oct. 7.2	61.48	20	53.6	3	4.00	40	80.4	5	10.99	108	41.5	5	21.87	24	49.9
17.2	61.29	19	52.9	7	3.62	38	79.4	10	9.95	104	40.5	10	21.64	23	49.0
27.1	61.12	17	51.7	12	3.27	35	77.8	16	8.97	98	39.0	15	21.43	21	47.7
Nov. 6.1	60.98	14	50.2	15	2.97	30	75.8	20	8.09	88	36.9	21	21.26	17	45.9
16.1	60.89	9	48.4	18	2.72	25	73.3	25	7.32	77	34.5	24	21.13	13	43.8
26.1	60.84	5	46.3	21	2.53	19	70.5	28	6.70	62	31.7	28	21.05	8	41.3
Dec. 6.0	60.83	1	43.9	24	2.42	11	67.3	32	6.23	47	28.5	32	21.02	3	38.5
16.0	60.88	5	41.3	26	2.39	3	63.9	34	5.95	28	25.1	34	21.04	2	35.5
26.0	60.98	10	38.6	27	2.43	4	60.4	35	5.85	10	21.6	35	21.12	8	32.4
36.0	61.12	14	35.8	28	2.55	12	56.9	35	5.94	9	18.1	35	21.26	14	29.3
Sec δ, Tan δ	1.113		+0.489		1.830		+1.533		4.436		+4.322		1.256		+0.76
Mean Place	$59^{\mathrm{s}}.469$		46″.13		$3^{\mathrm{s}}.608$		68″.48		$15^{\mathrm{s}}.179$		29″.41		$20^{\mathrm{s}}.263$		40″.07
$D'_{\psi} a$, $D_{\omega} a$	−0.01		0.00		−0.04		0.00		−0.11		+0.01		−0.02		0.00
$D_{\omega} \delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ν Ophiuchi. Mag. 3.5				ξ Herculis. Mag. 3.8				γ Draconis. Mag. 2.4				67 Ophiuchi. Mag. 3.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	17 54		− 9 45		17 54		+29 14		17 54		+51 29		17 56		+ 2 55	
	s		″		s		″		s		″		s		″	
an. 1.0	20.04		58.9		26.61		72.4		36.05		43.1		22.50		56.3	
10.9	20.23	19	59.8	9	26.78	17	69.5	29	36.22	17	39.6	35	22.68	18	54.7	16
20.9	20.46	23	60.7	9	26.99	21	66.8	27	36.44	22	36.4	32	22.90	22	53.1	16
30.9	20.72	26	61.6	9	27.23	24	64.3	25	36.72	28	33.4	30	23.14	24	51.6	15
Feb. 9.9	20.99	27	62.4	8	27.50	27	62.2	21	37.04	32	30.9	25	23.41	27	50.4	12
19.8	21.29	30	63.0	6	27.80	30	60.5	17	37.40	36	28.8	21	23.69	28	49.3	11
Mar. 1.8	21.59	30	63.5	5	28.11	31	59.2	13	37.79	39	27.4	14	23.98	29	48.6	7
11.8	21.90	31	63.8	3	28.42	31	58.5	7	38.19	40	26.5	9	24.28	30	48.1	5
21.7	22.21	31	63.8	0	28.74	32	58.4	1	38.60	41	26.3	2	24.58	30	48.0	1
31.7	22.52	31	63.7	1	29.06	32	58.8	4	39.01	41	26.8	5	24.88	30	48.3	3
Apr. 10.7	22.82	30	63.4	3	29.37	31	59.7	9	39.40	39	27.9	11	25.17	29	48.8	5
20.7	23.11	29	62.9	5	29.66	29	61.1	14	39.77	37	29.6	17	25.45	28	49.7	9
30.6	23.38	27	62.2	7	29.94	28	62.9	18	40.10	33	31.8	22	25.72	27	50.8	11
May 10.6	23.64	26	61.4	8	30.19	25	65.1	22	40.40	30	34.4	26	25.97	25	52.1	13
20.6	23.88	24	60.5	9	30.41	22	67.6	25	40.65	25	37.3	29	26.19	22	53.5	14
30.6	24.09	21	59.6	9	30.60	19	70.2	26	40.85	20	40.5	32	26.39	20	55.1	16
June 9.5	24.27	18	58.7	9	30.76	16	72.9	27	41.00	15	43.8	33	26.56	17	56.7	16
19.5	24.42	15	57.9	8	30.87	11	75.7	28	41.08	8	47.1	33	26.70	14	58.3	16
29.5	24.53	11	57.1	8	30.94	7	78.4	27	41.11	3	50.4	33	26.80	10	59.8	15
July 9.4	24.59	6	56.3	8	30.96	2	81.0	26	41.08	3	53.6	32	26.86	6	61.2	14
19.4	24.62	3	55.7	6	30.94	2	83.4	24	40.99	9	56.5	29	26.88	2	62.5	13
29.4	24.61	1	55.1	6	30.88	6	85.6	22	40.84	15	59.2	27	26.86	2	63.7	12
Aug. 8.4	24.55	6	54.6	5	30.78	10	87.4	18	40.64	20	61.5	23	26.80	6	64.7	10
18.3	24.46	9	54.2	4	30.64	14	89.0	16	40.39	25	63.4	19	26.71	9	65.6	9
28.3	24.34	12	53.9	3	30.47	17	90.3	13	40.10	29	64.9	15	26.58	13	66.2	6
Sept. 7.3	24.20	14	53.7	2	30.27	20	91.1	8	39.79	31	66.0	11	26.43	15	66.7	5
17.3	24.04	16	53.5	2	30.06	21	91.6	5	39.45	34	66.5	5	26.27	16	67.0	3
27.2	23.87	17	53.5	0	29.85	21	91.6	0	39.11	34	66.5	0	26.10	17	67.0	0
Oct. 7.2	23.71	16	53.5	0	29.63	22	91.3	3	38.77	34	66.1	4	25.93	17	66.9	1
17.2	23.56	15	53.6	1	29.43	20	90.5	8	38.45	32	65.1	10	25.78	15	66.6	3
27.1	23.43	13	53.8	2	29.26	17	89.3	12	38.15	30	63.6	15	25.65	13	66.0	6
Nov. 6.1	23.34	9	54.0	2	29.11	15	87.7	16	37.90	25	61.7	19	25.55	10	65.3	7
16.1	23.29	5	54.4	4	29.00	11	85.8	19	37.69	21	59.3	24	25.48	7	64.4	9
26.1	23.27	2	54.9	5	28.94	6	83.6	22	37.54	15	56.5	28	25.46	2	63.2	12
Dec. 6.0	23.31	4	55.5	6	28.93	1	81.1	25	37.46	8	53.4	31	25.49	3	61.9	13
16.0	23.39	8	56.2	7	28.97	4	78.4	27	37.44	2	50.1	33	25.56	7	60.5	14
26.0	23.52	13	57.0	8	29.06	9	75.6	28	37.49	5	46.7	34	25.67	11	58.9	16
36.0	23.69	17	57.9	9	29.20	14	72.7	29	37.62	13	43.2	35	25.83	16	57.3	16
Sec δ, Tan δ	1.015		−0.172		1.146		+0.560		1.606		+1.257		1.001		+0.051	
Mean Place	$20^{s}.790$		$50''.71$		$27^{s}.714$		$82''.89$		$37^{s}.932$		$54''.34$		$23^{s}.292$		$65''.30$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		0.00		−0.01		0.00		−0.03		0.00		0.00		0.00	
$D_{\psi}\delta$, $D_{\omega}\delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Aræ. Mag. 3.9				γ Sagittarii. Mag. 3.1				70 Ophiuchi. Mag. 4.1				72 Ophiuchi. Mag. 3.7		
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	17 59		−50 5		18 0		−30 25		18 1		+ 2 30		18 3		+ 9 3
	s		″		s		″		s		″		s		″
Jan. 1.0	59.58		60.4		19.92		41.1		8.70		57.0		18.31		54.5
10.9	59.86	28	58.9	15	20.15	23	40.8	3	8.88	18	55.4	16	18.48	17	52.5
20.9	60.19	33	57.5	14	20.40	25	40.5	3	9.09	21	53.8	16	18.69	21	50.6
30.9	60.57	38	56.4	11	20.69	29	40.3	2	9.33	24	52.4	14	18.92	23	48.9
Feb. 9.9	60.97	40	55.4	10	21.01	32	40.1	2	9.59	26	51.1	13	19.18	26	47.4
19.8	61.41	44	54.6	8	21.34	33	40.0	1	9.87	28	50.1	10	19.46	28	46.1
Mar. 1.8	61.86	45	54.1	5	21.69	35	39.9	1	10.16	29	49.3	8	19.74	28	45.2
11.8	62.32	46	53.7	4	22.04	35	39.9	0	10.46	30	48.8	5	20.04	30	44.7
21.8	62.79	47	53.6	1	22.40	36	39.8	1	10.76	30	48.7	1	20.34	30	44.6
31.7	63.26	47	53.7	1	22.75	35	39.8	0	11.06	30	48.9	2	20.64	30	44.9
Apr. 10.7	63.71	45	53.9	2	23.10	35	39.8	0	11.36	30	49.4	5	20.93	29	45.5
20.7	64.15	44	54.4	5	23.44	34	39.8	0	11.64	28	50.2	8	21.21	28	46.5
30.6	64.57	42	55.1	7	23.76	32	39.8	0	11.91	27	51.3	11	21.48	27	47.8
May 10.6	64.96	39	55.9	8	24.06	30	39.8	0	12.16	25	52.6	13	21.74	26	49.4
20.6	65.32	36	56.9	10	24.34	28	39.9	1	12.39	23	54.0	14	21.97	23	51.1
30.6	65.64	32	58.1	12	24.59	25	40.1	2	12.60	21	55.5	15	22.17	20	53.0
June 9.5	65.91	27	59.5	14	24.81	22	40.4	3	12.78	18	57.1	16	22.34	17	55.0
19.5	66.13	22	60.9	14	24.98	17	40.7	3	12.92	14	58.6	15	22.48	14	56.9
29.5	66.29	16	62.4	15	25.11	13	41.1	4	13.02	10	60.1	15	22.58	10	58.8
July 9.5	66.38	9	63.9	15	25.20	9	41.5	4	13.09	7	61.5	14	22.64	6	60.6
19.4	66.42	4	65.4	15	25.24	4	42.0	5	13.11	2	62.8	13	22.66	2	62.3
29.4	66.39	3	66.8	14	25.23	1	42.4	4	13.10	1	63.9	11	22.63	3	63.8
Aug. 8.4	66.30	9	68.1	13	25.18	5	42.9	5	13.04	6	64.9	10	22.57	6	65.1
18.3	66.16	14	69.2	11	25.08	10	43.3	4	12.95	9	65.7	8	22.47	10	66.2
28.3	65.97	19	70.0	8	24.95	13	43.6	3	12.83	12	66.4	7	22.34	13	67.0
Sept. 7.3	65.74	23	70.6	6	24.79	16	43.8	2	12.68	15	66.8	4	22.19	15	67.6
17.3	65.49	25	70.9	3	24.61	18	43.9	1	12.52	16	67.0	2	22.03	16	68.0
27.2	65.22	27	70.9	0	24.42	19	43.9	0	12.35	17	67.1	1	21.85	18	68.1
Oct. 7.2	64.96	26	70.6	3	24.23	19	43.7	2	12.19	16	67 0	1	21.68	17	67.9
17.2	64.72	24	69.9	7	24.06	17	43.4	3	12.03	16	66.6	4	21.52	16	67.5
27.2	64.51	21	68.9	10	23.92	14	43.0	4	11.90	13	66.1	5	21.37	15	66.8
Nov. 6.1	64.35	16	67.7	12	23.81	11	42.5	5	11.80	10	65.3	8	21.26	11	65.9
16.1	64.25	10	66.2	15	23.74	7	41.9	6	11.73	7	64.4	9	21.18	8	64.7
26.1	64.21	4	64.6	16	23.73	1	41.3	6	11.71	2	63.3	11	21.15	3	63.3
Dec. 6.0	64.24	3	62.9	17	23.76	3	40.7	6	11.73	2	62.0	13	21.16	1	61.7
16.0	64.35	11	61.2	17	23.85	9	40.1	6	11.79	6	60.5	15	21.22	6	59.9
26.0	64.52	17	59.5	17	24.00	15	39.6	5	11.90	11	59.0	15	21.32	10	58.0
36.0	64.76	24	57.9	16	24.19	19	39.2	4	12.06	16	57.4	16	21.46	14	56.1
Sec δ, Tan δ	1.559		−1.196		1.160		−0.587		1.001		+0.044		1.014		+0.168
Mean Place	$60^{s}.826$		54″.70		$20^{s}.778$		34″.24		$9^{s}.496$		65″.91		$19^{s}.161$		63″.65
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.03		0.00		+0.02		0.00		0.00		0.00		0.00		0.00
$D_{\psi}\delta$, $D_{\omega}\delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	o Herculis. Mag. 3.8				μ Sagittarii. Mag. 4.0				η Sagittarii. Mag. 3.2				Groombridge 2533. Mag. 5.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	18 4		+28 44		18 8		−21 4		18 11		−36 47		18 12		+42 7	
	s		″		s		″		s		″		s		″	
Jan. 1.0	12.47		50.2		39.98		63.0		51.65		23.8		58.61		37.6	
11.0	12.62	15	47.4	28	40.18	20	63.1	1	51.87	22	23.0	8	58.75	14	34.4	32
20.9	12.82	20	44.7	27	40.41	23	63.3	2	52.13	26	22.3	7	58.94	19	31.3	31
30.9	13.05	23	42.3	24	40.67	26	63.5	2	52.43	30	21.7	6	59.18	24	28.4	29
Feb. 9.9	13.32	27	40.1	22	40.96	29	63.7	2	52.76	33	21.1	6	59.45	27	25.9	25
19.8	13.61	29	38.4	17	41.26	30	63.9	2	53.11	35	20.7	4	59.76	31	23.9	20
Mar. 1.8	13.91	30	37.1	13	41.58	32	64.0	1	53.47	36	20.3	4	60.09	33	22.3	16
11.8	14.22	31	36.4	7	41.91	33	64.0	0	53.85	38	20.1	2	60.44	35	21.4	9
21.8	14.54	32	36.1	3	42.23	32	63.9	1	54.22	37	19.9	2	60.80	36	21.1	3
31.7	14.86	32	36.5	4	42.56	33	63.8	1	54.60	38	19.7	2	61.15	35	21.4	3
Apr. 10.7	15.17	31	37.3	8	42.89	33	63.5	3	54.98	38	19.7	0	61.50	35	22.3	9
20.7	15.47	30	38.7	14	43.20	31	63.2	3	55.34	36	19.7	0	61.84	34	23.7	14
30.7	15.75	28	40.5	18	43.50	30	62.8	4	55.70	36	19.8	1	62.15	31	25.7	20
May 10.6	16.01	26	42.6	21	43.79	29	62.5	3	56.03	33	20.0	2	62.44	29	28.0	23
20.6	16.24	23	45.0	24	44.05	26	62.1	4	56.34	31	20.4	4	62.69	25	30.7	27
30.6	16.43	19	47.6	26	44.29	24	61.7	4	56.61	27	20.8	4	62.91	22	33.7	30
June 9.5	16.60	17	50.4	28	44.50	21	61.4	3	56.85	24	21.3	5	63.08	17	36.9	32
19.5	16.72	12	53.1	27	44.67	17	61.1	3	57.05	20	22.0	7	63.20	12	40.1	32
29.5	16.80	8	55.9	28	44.80	13	60.9	2	57.21	16	22.7	7	63.27	7	43.2	31
July 9.5	16.84	4	58.5	26	44.89	9	60.8	1	57.31	10	23.5	8	63.29	2	46.3	31
19.4	16.83	1	60.9	24	44.94	5	60.7	1	57.36	5	24.3	8	63.26	3	49.2	29
29.4	16.77	6	63.2	23	44.94	0	60.7	0	57.36	0	25.1	8	63.18	8	51.8	26
Aug. 8.4	16.68	9	65.1	19	44.89	5	60.7	0	57.31	5	25.8	7	63.05	13	54.2	24
18.4	16.55	13	66.8	17	44.81	8	60.8	1	57.21	10	26.5	7	62.87	18	56.2	20
28.3	16.38	17	68.1	13	44.69	12	60.8	0	57.08	13	27.1	6	62.66	21	57.8	16
Sept. 7.3	16.19	19	69.0	9	44.55	14	60.8	0	56.91	17	27.5	4	62.42	24	59.0	12
17.3	15.99	20	69.5	5	44.39	16	60.8	0	56.71	20	27.7	2	62.16	26	59.7	7
27.2	15.77	22	69.7	2	44.21	18	60.8	0	56.51	20	27.8	1	61.88	28	60.0	3
Oct. 7.2	15.56	21	69.4	3	44.04	17	60.8	0	56.30	21	27.6	2	61.61	27	59.8	2
17.2	15.36	20	68.8	6	43.88	16	60.7	1	56.11	19	27.3	3	61.35	26	59.1	7
27.2	15.18	18	67.7	11	43.74	14	60.5	2	55.95	16	26.8	5	61.11	24	57.9	12
Nov. 6.1	15.03	15	66.2	15	43.64	10	60.4	1	55.82	13	26.1	7	60.90	21	56.3	16
16.1	14.91	12	64.4	18	43.57	7	60.3	1	55.74	8	25.2	9	60.73	17	54.2	21
26.1	14.84	7	62.2	22	43.55	2	60.2	1	55.70	4	24.3	9	60.61	12	51.8	24
Dec. 6.1	14.82	2	59.8	24	43.58	3	60.1	1	55.73	3	23.4	9	60.55	6	49.0	28
16.0	14.85	3	57.2	26	43.66	8	60.1	0	55.81	8	22.4	10	60.54	1	46.0	30
26.0	14.93	8	54.4	28	43.78	12	60.1	0	55.94	13	21.5	9	60.59	5	42.8	32
36.0	15.06	13	51.6	28	43.95	17	60.2	1	56.13	19	20.6	9	60.69	10	39.6	32
Sec δ, Tan δ	1.141		+0.549		1.072		−0.386		1.249		−0.748		1.348		+0.904	
Mean Place	13ˢ.580		60″.20		40ˢ.769		55″.37		52ˢ.576		16″.92		60ˢ.119		47″.25	
$D'_\psi \alpha$, $D_\omega \alpha$	−0.01		0.00		+0.01		0.00		+0.02		0.00		−0.02		0.00	
$D_\psi \delta$, $D_\omega \delta$	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	36 Draconis. Mag. 5.0				δ Sagittarii. Mag. 2.8				η Serpentis. Mag. 3.4				ε Sagittarii. Mag. 2.0		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	18 13		+64 21		18 15		−29 51		18 16		− 2 55		18 18		−34 2
	s		″		s		″		s		″		s		″
Jan. 1.0	21.32		56.3		32.30		62.3		53.86		26.4		30.90		39.8
11.0	21.46	14	52.7	36	32.50	20	61.9	4	54.03	17	27.7	13	31.11	21	39.1
20.9	21.68	22	49.3	34	32.74	24	61.6	3	54.23	20	28.9	12	31.36	25	38.5
30.9	21.99	31	46.2	31	33.02	28	61.3	3	54.46	23	30.0	11	31.65	29	37.9
Feb. 9.9	22.37	38	43.4	28	33.32	30	61.0	3	54.71	25	31.0	10	31.96	31	37.4
19.8	22.82	45	41.1	23	33.64	32	60.8	2	54.98	27	31.8	8	32.29	33	37.0
Mar. 1.8	23.32	50	39.4	17	33.98	34	60.6	2	55.27	29	32.4	6	32.64	35	36.6
11.8	23.85	53	38.3	11	34.33	35	60.4	2	55.56	29	32.7	3	33.01	37	36.3
21.8	24.40	55	37.9	4	34.68	35	60.2	2	55.86	30	32.8	1	33.37	36	36.1
31.7	24.95	55	38.2	3	35.03	35	60.0	2	56.17	31	32.5	3	33.74	37	35.9
Apr. 10.7	25.49	54	39.1	9	35.38	35	59.8	2	56.47	30	32.0	5	34.11	37	35.7
20.7	25.99	50	40.7	16	35.72	34	59.7	1	56.76	29	31.3	7	34.47	36	35.6
30.7	26.46	47	42.8	21	36.05	33	59.5	2	57.04	28	30.3	10	34.81	34	35.6
May 10.6	26.87	41	45.3	25	36.36	31	59.4	1	57.30	26	29.2	11	35.14	33	35.7
20.6	27.21	34	48.3	30	36.65	29	59.4	0	57.55	25	28.0	12	35.45	31	35.8
30.6	27.48	27	51.5	32	36.91	26	59.5	1	57.77	22	26.7	13	35.72	27	36.1
June 9.5	27.67	19	54.9	34	37.14	23	59.6	1	57.96	19	25.4	13	35.97	25	36.5
19.5	27.77	10	58.4	35	37.33	19	59.8	2	58.12	16	24.0	14	36.17	20	36.9
29.5	27.79	2	61.8	34	37.48	15	60.1	3	58.24	12	22.8	12	36.32	15	37.5
July 9.5	27.72	7	65.2	34	37.58	10	60.5	4	58.32	8	21.6	12	36.43	11	38.1
19.4	27.57	15	68.4	32	37.64	6	60.9	4	58.36	4	20.5	11	36.49	6	38.8
29.4	27.33	24	71.3	29	37.65	1	61.3	4	58.36	0	19.6	9	36.50	1	39.5
Aug. 8.4	27.02	31	73.9	26	37.61	4	61.8	5	58.32	4	18.8	8	36.46	4	40.1
18.4	26.64	38	76.2	23	37.52	9	62.2	4	58.24	8	18.1	7	36.37	9	40.7
28.3	26.21	43	78.0	18	37.40	12	62.6	4	58.13	11	17.6	5	36.24	13	41.3
Sept. 7.3	25.73	48	79.3	13	37.25	15	62.8	2	57.99	14	17.2	4	36.08	16	41.7
17.3	25.22	51	80.2	9	37.07	18	63.0	2	57.83	16	17.0	2	35.90	18	41.9
27.2	24.69	53	80.5	3	36.89	18	63.0	0	57.67	16	16.9	1	35.70	20	42.0
Oct. 7.2	24.16	53	80.3	2	36.70	19	62.9	1	57.50	17	17.0	1	35.50	20	41.9
17.2	23.65	51	79.6	7	36.52	18	62.7	2	57.34	16	17.2	2	35.31	19	41.7
27.2	23.17	48	78.3	13	36.37	15	62.4	3	57.21	13	17.6	4	35.15	16	41.2
Nov. 6.1	22.73	44	76.5	18	36.25	12	62.0	4	57.10	11	18.1	5	35.02	13	40.7
16.1	22.35	38	74.3	22	36.17	8	61.5	5	57.02	8	18.8	7	34.94	8	40.0
26.1	22.05	30	71.6	27	36.14	3	60.9	6	56.99	3	19.6	8	34.90	4	39.2
Dec. 6.1	21.83	22	68.5	31	36.16	2	60.3	6	57.00	1	20.6	10	34.92	2	38.3
16.0	21.71	12	65.2	33	36.24	8	59.8	5	57.05	5	21.6	10	34.99	7	37.5
26.0	21.68	3	61.7	35	36.37	13	59.2	6	57.15	10	22.8	12	35.12	13	36.7
36.0	21.75	7	58.2	35	36.54	17	58.8	4	57.29	14	24.0	12	35.29	17	35.9
Sec δ, Tan δ	2.312		+2.084		1.153		−0.574		1.001		−0.051		1.212		−0.685
Mean Place	24ˢ.460		65″.91		33ˢ.142		55″.00		54ˢ.642		18″.03		31ˢ.792		32″.56
D′ψ α, Dω α	−0.06		−0.01		+0.02		0.00		0.00		0.00		+0.02		0.00
Dψ δ, Dω δ	0.0		−1.0		0.0		−1.0		0.0		−1.0		0.0		−1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

109 Herculis. Mag. 3.9

Mean Solar Date.	Right Ascension.		Declination N.	
	h m		° ′	
	18 20		+21 43	
	s		″	
Jan. 1.0	3.51		39.7	
11.0	3.66	15	37.2	25
20.9	3.84	18	34.8	24
30.9	4.06	22	32.5	23
Feb. 9.9	4.31	25	30.5	20
19.9	4.58	27	28.9	16
Mar. 1.8	4.87	29	27.7	12
11.8	5.17	30	27.0	7
21.8	5.47	30	26.7	3
31.7	5.78	31	27.0	3
Apr. 10.7	6.08	30	27.7	7
20.7	6.38	30	28.9	12
30.7	6.66	28	30.5	16
May 10.6	6.93	27	32.4	19
20.6	7.17	24	34.6	22
30.6	7.38	21	36.9	23
June 9.5	7.56	18	39.4	25
19.5	7.71	15	41.9	25
29.5	7.81	10	44.4	25
July 9.5	7.87	6	46.8	24
19.4	7.89	2	49.1	23
29.4	7.87	2	51.2	21
Aug. 8.4	7.80	7	53.0	18
18.4	7.70	10	54.6	16
28.3	7.56	14	55.8	12
Sept. 7.3	7.39	17	56.7	9
17.3	7.21	18	57.3	6
27.2	7.02	19	57.6	3
Oct. 7.2	6.82	20	57.5	1
17.2	6.63	19	57.0	5
27.2	6.46	17	56.2	8
Nov. 6.1	6.32	14	55.0	12
16.1	6.22	10	53.4	16
26.1	6.15	7	51.6	18
Dec. 6.1	6.13	2	49.5	21
16.0	6.15	2	47.3	22
26.0	6.23	8	44.8	25
36.0	6.35	12	42.3	25
Sec δ, Tan δ	1.076		+0.399	
Mean Place	$4^s.529$		48″.57	
$D'_\psi\alpha$, $D_\omega\alpha$	−0.01		0.00	
$D_\psi\delta$, $D_\omega\delta$	0.0		−1.0	

α Telescopii. Mag. 3.8

Mean Solar Date.	Right Ascension.		Declination S.	
	h m		° ′	
	18 20		−46 0	
	s		″	
Jan. 1.0	39.17		66.1	
11.0	39.40	23	64.7	14
20.9	39.69	29	63.4	13
30.9	40.01	32	62.2	12
Feb. 9.9	40.37	36	61.2	10
19.9	40.76	39	60.3	9
Mar. 1.8	41.17	41	59.6	7
11.8	41.60	43	59.0	6
21.8	42.03	43	58.6	4
31.7	42.46	43	58.4	2
Apr. 10.7	42.89	43	58.4	0
20.7	43.31	42	58.5	1
30.7	43.71	40	58.8	3
May 10.6	44.09	38	59.3	5
20.6	44.45	36	60.0	7
30.6	44.77	32	60.8	8
June 9.5	45.05	28	61.7	9
19.5	45.28	23	62.8	11
29.5	45.46	18	64.0	12
July 9.5	45.58	12	65.3	13
19.4	45.64	6	66.6	13
29.4	45.65	1	67.9	13
Aug. 8.4	45.59	6	69.1	12
18.4	45.48	11	70.2	11
28.3	45.33	15	71.0	8
Sept. 7.3	45.13	20	71.7	7
17.3	44.90	23	72.2	5
27.2	44.66	24	72.4	2
Oct. 7.2	44.42	24	72.2	2
17.2	44.19	23	71.8	4
27.2	43.99	20	71.1	7
Nov. 6.1	43.83	16	70.2	9
16.1	43.72	11	69.0	12
26.1	43.66	6	67.6	14
Dec. 6.1	43.67	1	66.2	14
16.0	43.74	7	64.7	15
26.0	43.88	14	63.2	15
36.0	44.07	19	61.7	15
Sec δ, Tan δ	1.440		−1.036	
Mean Place	$40^s.265$		59″.17	
$D'_\psi\alpha$, $D_\omega\alpha$	+0.03		+0.01	
$D_\psi\delta$, $D_\omega\delta$	0.0		−1.0	

χ Draconis. Mag. 3.7

Mean Solar Date.	Right Ascension.		Declination N.	
	h m		° ′	
	18 22		+72 41	
	s		″	
Jan. 1.0	30.57		37.6	
11.0	30.67	10	34.0	36
20.9	30.91	24	30.6	34
30.9	31.28	37	27.4	32
Feb. 9.9	31.77	49	24.6	28
19.9	32.36	59	22.2	24
Mar. 1.8	33.03	67	20.4	18
11.8	33.76	73	19.2	12
21.8	34.52	76	18.7	5
31.7	35.29	77	18.8	1
Apr. 10.7	36.04	75	19.6	8
20.7	36.75	71	21.0	14
30.7	37.40	65	22.9	19
May 10.6	37.96	56	25.4	25
20.6	38.43	47	28.2	28
30.6	38.80	37	31.4	32
June 9.5	39.04	24	34.7	33
19.5	39.16	12	38.2	35
29.5	39.16	0	41.7	35
July 9.5	39.02	14	45.1	34
19.4	38.77	25	48.3	32
29.4	38.40	37	51.3	30
Aug. 8.4	37.92	48	54.0	27
18.4	37.35	57	56.3	23
28.3	36.69	66	58.3	20
Sept. 7.3	35.97	72	59.7	14
17.3	35.20	77	60.7	10
27.2	34.40	80	61.2	5
Oct. 7.2	33.60	80	61.2	0
17.2	32.81	79	60.6	6
27.2	32.06	75	59.4	12
Nov. 6.1	31.37	69	57.8	16
16.1	30.76	61	55.7	21
26.1	30.24	52	53.1	26
Dec. 6.1	29.84	40	50.2	29
16.0	29.57	27	46.9	33
26.0	29.44	13	43.5	34
36.0	29.45	1	40.0	35
Sec δ, Tan δ	3.362		+3.209	
Mean Place	$35^s.509$		46″.21	
$D'_\psi\alpha$, $D_\omega\alpha$	−0.08		−0.02	
$D_\psi\delta$, $D_\omega\delta$	0.0		−1.0	

λ Sagittarii. Mag. 2.9

Mean Solar Date.	Right Ascension.		Declination S.	
	h m		° ′	
	18 22		−25 28	
	s		″	
Jan. 1.0	42.70		18.9	
11.0	42.89	19	18.7	2
20.9	43.12	23	18.6	1
30.9	43.37	25	18.5	1
Feb. 9.9	43.66	29	18.4	1
19.9	43.96	30	18.3	1
Mar. 1.8	44.28	32	18.1	2
11.8	44.61	33	18.0	1
21.8	44.95	34	17.8	2
31.7	45.29	34	17.5	3
Apr. 10.7	45.63	34	17.2	3
20.7	45.96	33	16.9	3
30.7	46.28	32	16.6	3
May 10.6	46.58	30	16.3	3
20.6	46.87	29	16.0	3
30.6	47.12	25	15.8	2
June 9.5	47.35	23	15.6	2
19.5	47.54	19	15.5	1
29.5	47.69	15	15.6	1
July 9.5	47.80	11	15.7	1
19.4	47.86	6	15.8	1
29.4	47.87	1	16.0	2
Aug. 8.4	47.84	3	16.3	3
18.4	47.76	8	16.5	2
28.3	47.65	11	16.8	3
Sept. 7.3	47.50	15	17.0	2
17.3	47.34	16	17.1	1
27.2	47.16	18	17.2	1
Oct. 7.2	46.98	18	17.1	1
17.2	46.81	17	17.0	1
27.2	46.67	14	16.8	2
Nov. 6.1	46.55	12	16.6	2
16.1	46.47	8	16.3	3
26.1	46.43	4	16.0	3
Dec. 6.1	46.45	2	15.7	3
16.0	46.51	6	15.4	3
26.0	46.62	11	15.1	3
36.0	46.79	17	14.9	2
Sec δ, Tan δ	1.108		−0.476	
Mean Place	$43^s.506$		11″.22	
$D'_\psi\alpha$, $D_\omega\alpha$	+0.01		0.00	
$D_\psi\delta$, $D_\omega\delta$	0.0		−1.0	

Mean Solar Date.	c Serpentis. Mag. 5.4 Right Ascension.		c Serpentis. Mag. 5.4 Declination S.		1 Aquilæ. Mag. 4.1 Right Ascension.		1 Aquilæ. Mag. 4.1 Declination S.		ζ Pavonis. Mag. 4.1 Right Ascension.		ζ Pavonis. Mag. 4.1 Declination S.		α Lyræ. (*Vega.*) Mag. 0.1 Right Ascension.		α Lyræ. (*Vega.*) Mag. 0.1 Declination N.
	h m 18 25		° ′ − 2 2		h m 18 30		° ′ − 8 18		h m 18 33		° ′ −71 30		h m 18 34		° +38 4
	s		″		s		″		s		″		s		″
Jan. 1.0	14.76	16	36.4	13	34.12	16	23.9	9	3.59	38	16.5	28	2.20	11	66.1
11.0	14.92	20	37.7	12	34.28	19	24.8	8	3.97	49	13.7	26	2.31	17	63.0
20.9	15.12	22	38.9	11	34.47	23	25.6	8	4.46	59	11.1	24	2.48	21	60.0
30.9	15.34	25	40.0	10	34.70	25	26.4	7	5.05	68	8.7	21	2.69	25	57.2
Feb. 9.9	15.59	27	41.0	8	34.95	27	27.1	5	5.73	76	6.6	19	2.94	28	54.7
19.9	15.86	28	41.8	6	35.22	29	27.6	4	6.49	81	4.7	15	3.22	31	52.6
Mar. 1.8	16.14	29	42.4	3	35.51	29	28.0	1	7.30	85	3.2	11	3.53	33	51.0
11.8	16.43	30	42.7	0	35.80	31	28.1	0	8.15	88	2.1	7	3.86	34	49.9
21.8	16.73	30	42.7	3	36.11	30	28.1	3	9.03	88	1.4	4	4.20	34	49.5
31.7	17.03	30	42.4	5	36.41	31	27.8	5	9.91	88	1.0	0	4.54	34	49.6
Apr. 10.7	17.33	30	41.9	8	36.72	30	27.3	7	10.79	86	1.0	4	4.88	34	50.3
20.7	17.63	28	41.1	10	37.02	29	26.6	9	11.65	83	1.4	8	5.22	32	51.6
30.7	17.91	27	40.1	12	37.31	28	25.7	9	12.48	78	2.2	12	5.54	29	53.4
May 10.6	18.18	25	38.9	13	37.59	26	24.8	11	13.26	71	3.4	14	5.83	27	55.6
20.6	18.43	23	37.6	14	37.85	24	23.7	11	13.97	64	4.8	18	6.10	24	58.2
30.6	18.66	20	36.2	15	38.09	21	22.6	11	14.61	54	6.6	20	6.34	19	61.1
June 9.6	18.86	17	34.7	14	38.30	18	21.5	11	15.15	43	8.6	22	6.53	15	64.1
19.5	19.03	13	33.3	13	38.48	14	20.4	10	15.58	33	10.8	24	6.68	10	67.3
29.5	19.16	9	32.0	13	38.62	10	19.4	9	15.91	20	13.2	25	6.78	5	70.4
July 9.5	19.25	4	30.7	12	38.72	5	18.5	9	16.11	8	15.7	24	6.83	0	73.5
19.4	19.29	1	29.5	10	38.77	2	17.6	7	16.19	5	18.1	24	6.83	4	76.4
29.4	19.30	4	28.5	9	38.79	3	16.9	6	16.14	18	20.5	23	6.79	10	79.1
Aug. 8.4	19.26	7	27.6	7	38.76	7	16.3	4	15.96	28	22.8	20	6.69	14	81.6
18.4	19.19	10	26.9	6	38.69	10	15.9	4	15.68	39	24.8	17	6.55	18	83.7
28.3	19.09	14	26.3	4	38.59	13	15.5	2	15.29	48	26.5	13	6.37	21	85.5
Sept. 7.3	18.95	15	25.9	3	38.46	15	15.3	2	14.81	54	27.8	9	6.16	24	86.8
17.3	18.80	17	25.6	1	38.31	16	15.1	0	14.27	57	28.7	4	5.92	25	87.8
27.3	18.63	16	25.5	1	38.15	17	15.1	0	13.70	59	29.1	1	5.67	25	88.3
Oct. 7.2	18.47	16	25.6	2	37.98	16	15.1	1	13.11	57	29.0	6	5.42	25	88.3
17.2	18.31	14	25.8	3	37.82	14	15.2	3	12.54	53	28.4	11	5.17	23	87.9
27.2	18.17	12	26.1	5	37.68	11	15.5	3	12.01	45	27.3	15	4.94	21	87.0
Nov. 6.1	18.05	7	26.6	7	37.57	9	15.8	4	11.56	36	25.8	20	4.73	17	85.7
16.1	17.98	4	27.3	8	37.48	4	16.2	5	11.20	25	23.8	23	4.56	12	83.9
26.1	17.94	0	28.1	10	37.44	1	16.7	7	10.95	12	21.5	26	4.44	7	81.7
Dec. 6.1	17.94	5	29.1	11	37.45	4	17.4	7	10.83	2	18.9	28	4.37	2	79.2
16.0	17.99	9	30.2	11	37.49	9	18.1	8	10.85	15	16.1	28	4.35	2	76.4
26.0	18.08	13	31.3	13	37.58	14	18.9	8	11.00	29	13.3	28	4.37	9	73.4
36.0	18.21		32.6		37.72		19.7		11.29		10.5		4.46		70.4
Sec δ, Tan δ	1.001		−0.036		1.011		−0.146		3.152		−2.989		1.281		+0.801
Mean Place	$15^{s}.552$		$28''.12$		$34^{s}.890$		$15''.77$		$6^{s}.395$		$9''.66$		$3^{s}.632$		$74''.11$
D′ψ α, Dω α	0.00		0.00		0.00		0.00		+0.08		+0.03		−0.02		−0.01
D′ψ δ, Dω δ	0.0		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**2 Aquilæ.** Mag. 4.7				**φ Sagittarii.** Mag. 3.3				**110 Herculis.** Mag. 4.3				**6 Aquilæ.** Mag. 4.5			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 18 37		° ′ − 9 8		h m 18 40		° ′ −27 4		h m 18 41		° ′ +20 27		h m 18 42		° ′ − 4 50	
	s		″		s		″		s		″		s		″	
Jan. 1.0	36.48		13.3		19.97		52.8		59.15		43.1		39.09		31.0	
11.0	36.63	15	14.0	7	20.14	17	52.5	3	59.27	12	40.7	24	39.23	14	32.0	10
20.9	36.82	19	14.8	8	20.35	21	52.1	4	59.43	16	38.4	23	39.41	18	33.0	10
30.9	37.04	22	15.5	7	20.60	25	51.8	3	59.63	20	36.2	22	39.62	21	33.9	9
Feb. 9.9	37.29	25	16.1	6	20.87	27	51.5	3	59.86	23	34.3	19	39.86	24	34.7	8
19.9	37.55	26	16.6	5	21.17	30	51.2	3	60.11	25	32.7	16	40.12	26	35.3	6
Mar. 1.8	37.84	29	16.9	3	21.48	31	50.9	3	60.38	27	31.4	13	40.39	27	35.8	5
11.8	38.13	29	17.0	1	21.81	33	50.5	4	60.67	29	30.6	8	40.68	29	36.0	2
21.8	38.43	30	16.9	1	22.15	34	50.1	4	60.97	30	30.3	3	40.98	30	35.9	1
31.8	38.74	31	16.6	3	22.49	34	49.7	4	61.28	31	30.5	2	41.28	30	35.6	3
Apr. 10.7	39.05	31	16.0	6	22.83	34	49.3	4	61.58	30	31.1	6	41.59	31	35.0	6
20.7	39.35	30	15.3	7	23.17	34	48.8	5	61.88	30	32.2	11	41.89	30	34.2	8
30.7	39.65	30	14.4	9	23.50	33	48.4	4	62.18	30	33.7	15	42.18	29	33.2	10
May 10.6	39.93	28	13.4	10	23.82	32	48.0	4	62.45	27	35.6	19	42.46	28	32.0	12
20.6	40.20	27	12.3	11	24.12	30	47.7	3	62.71	26	37.7	21	42.73	27	30.8	12
30.6	40.44	24	11.2	11	24.40	28	47.4	3	62.94	23	40.0	23	42.97	24	29.4	14
June 9.6	40.66	22	10.1	11	24.64	24	47.2	2	63.14	20	42.5	25	43.19	22	28.1	13
19.5	40.84	18	9.0	11	24.85	21	47.2	0	63.31	17	45.0	25	43.37	18	26.8	13
29.5	40.99	15	8.0	10	25.02	17	47.2	0	63.44	13	47.5	25	43.52	15	25.5	13
July 9.5	41.10	11	7.1	9	25.15	13	47.3	1	63.52	8	49.9	24	43.63	11	24.3	12
19.5	41.16	6	6.3	8	25.23	8	47.6	3	63.56	4	52.2	23	43.69	6	23.3	10
29.4	41.18	2	5.7	6	25.26	3	47.9	3	63.56	0	54.3	21	43.72	3	22.4	9
Aug. 8.4	41.16	2	5.1	6	25.24	2	48.2	3	63.51	5	56.3	20	43.70	2	21.6	8
18.4	41.10	6	4.7	4	25.18	6	48.6	4	63.42	9	57.9	16	43.64	6	20.9	7
28.3	41.00	10	4.3	4	25.07	11	48.9	3	63.30	12	59.3	14	43.54	10	20.4	5
Sept. 7.3	40.88	12	4.1	2	24.93	14	49.2	3	63.15	15	60.3	10	43.42	12	20.1	3
17.3	40.73	15	4.0	1	24.77	16	49.5	3	62.97	18	61.0	7	43.27	15	19.9	2
27.3	40.57	16	3.9	1	24.60	17	49.6	1	62.79	18	61.4	4	43.11	16	19.8	1
Oct. 7.2	40.40	17	4.0	1	24.41	19	49.7	1	62.59	20	61.4	0	42.94	17	19.8	0
17.2	40.24	16	4.1	1	24.24	17	49.6	1	62.40	19	61.1	3	42.78	16	19.9	1
27.2	40.10	14	4.3	2	24.08	16	49.5	1	62.23	17	60.5	6	42.64	14	20.2	3
Nov. 6.2	39.98	12	4.6	3	23.95	13	49.2	3	62.08	15	59.5	10	42.52	12	20.6	4
16.1	39.89	9	4.9	3	23.86	9	48.9	3	61.96	12	58.1	14	42.43	9	21.2	6
26.1	39.85	4	5.4	5	23.81	5	48.5	4	61.89	7	56.5	16	42.37	6	21.8	6
Dec. 6.1	39.84	1	6.0	6	23.80	1	48.1	4	61.85	4	54.6	19	42.36	1	22.6	8
16.0	39.89	5	6.6	6	23.85	5	47.7	4	61.85	0	52.5	21	42.40	4	23.5	9
26.0	39.97	8	7.3	7	23.95	10	47.3	4	61.90	5	50.2	23	42.48	8	24.4	9
36.0	40.10	13	8.1	8	24.09	14	46.9	4	62.00	10	47.8	24	42.60	12	25.4	10
Sec δ, Tan δ	1.013		−0.161		1.123		−0.511		1.067		+0.373		1.004		−0.085	
Mean Place	37ˢ.244		5″.20		20ˢ.767		44″.82		60ˢ.160		50″.89		39ˢ.865		22″.95	
D′ψ α, Dω α	0.00		0.00		+0.01		+0.01		−0.01		0.00		0.00		0.00	
Dψ δ, Dω δ	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

Mean Solar Date.	λ Pavonis. Mag. 4.4				β Lyræ. Var. 3.4–4.1				50 Draconis. Mag. 5.4				o Draconis. Mag. 4.8		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N
	h m		° ′		h m		° ′		h m		° ′		h m		°
	18 44		−62 17		18 46		+33 15		18 48		+75 19		18 49		+59 1
	s		″		s		″		s		″		s		″
Jan. 1.0	18.92		18.4		55.20		40.8		61.31		56.7		54.28		56.9
11.0	19.19	27	16.0	24	55.31	11	37.9	29	61.30	1	53.2	35	54.34	6	53.4
21.0	19.53	34	13.7	23	55.46	15	35.0	29	61.46	16	49.8	34	54.48	14	50.0
30.9	19.94	41	11.6	21	55.65	19	32.4	26	61.78	32	46.5	33	54.70	22	46.7
Feb. 9.9	20.41	47	9.6	20	55.88	23	30.0	24	62.25	47	43.5	30	54.99	29	43.8
19.9	20.93	52	7.9	17	56.14	26	28.0	20	62.85	60	41.0	25	55.34	35	41.3
Mar. 1.8	21.48	55	6.5	14	56.43	29	26.4	16	63.56	71	38.9	21	55.73	39	39.2
11.8	22.07	59	5.3	12	56.74	31	25.3	11	64.36	80	37.4	15	56.17	44	37.8
21.8	22.68	61	4.5	8	57.06	32	24.8	5	65.22	86	36.5	9	56.63	46	37.0
31.8	23.30	62	3.9	6	57.38	32	24.9	1	66.10	88	36.3	2	57.11	48	36.9
Apr. 10.7	23.92	62	3.7	2	57.71	33	25.5	6	66.98	88	36.8	5	57.59	48	37.4
20.7	24.53	61	3.8	1	58.03	32	26.7	12	67.83	85	37.9	11	58.05	46	38.6
30.7	25.13	60	4.2	4	58.34	31	28.4	17	68.62	79	39.5	16	58.49	44	40.3
May 10.7	25.69	56	4.9	7	58.64	30	30.5	21	69.33	71	41.7	22	58.90	41	42.6
20.6	26.21	52	5.9	10	58.91	27	32.9	24	69.94	61	44.4	27	59.26	36	45.3
30.6	26.69	48	7.2	13	59.15	24	35.6	27	70.43	49	47.4	30	59.57	31	48.3
June 9.6	27.11	42	8.8	16	59.36	21	38.5	29	70.78	35	50.6	32	59.81	24	51.6
19.5	27.46	35	10.5	17	59.52	16	41.4	29	70.99	21	54.1	35	59.99	18	55.1
29.5	27.73	27	12.5	20	59.65	13	44.4	30	71.06	7	57.6	35	60.09	10	58.6
July 9.5	27.92	19	14.5	20	59.72	7	47.4	30	70.98	8	61.1	35	60.12	3	62.1
19.5	28.02	10	16.6	21	59.75	3	50.2	28	70.75	23	64.5	34	60.07	5	65.5
29.4	28.03	1	18.6	20	59.72	3	52.8	26	70.37	38	67.7	32	59.95	12	68.7
Aug. 8.4	27.96	7	20.6	20	59.65	7	55.2	24	69.87	50	70.7	30	59.75	20	71.6
18.4	27.80	16	22.4	18	59.54	11	57.3	21	69.25	62	73.3	26	59.50	25	74.3
28.3	27.57	23	24.0	16	59.39	15	59.1	18	68.52	73	75.6	23	59.18	32	76.5
Sept. 7.3	27.27	30	25.2	12	59.21	18	60.5	14	67.70	82	77.5	19	58.82	36	78.3
17.3	26.93	34	26.1	9	59.00	21	61.5	10	66.82	88	78.9	14	58.42	40	79.7
27.3	26.56	37	26.6	5	58.78	22	62.0	5	65.89	93	79.9	10	58.00	42	80.5
Oct. 7.2	26.18	38	26.7	1	58.55	23	62.2	2	64.94	95	80.3	4	57.57	43	80.9
17.2	25.80	38	26.3	4	58.32	23	61.9	3	63.98	96	80.1	2	57.14	43	80.7
27.2	25.45	35	25.5	8	58.11	21	61.2	7	63.06	92	79.4	7	56.73	41	79.9
Nov. 6.2	25.15	30	24.3	12	57.92	19	60.0	12	62.19	87	78.2	12	56.34	39	78.6
16.1	24.91	24	22.7	16	57.77	15	58.4	16	61.39	80	76.5	17	56.00	34	76.9
26.1	24.75	16	20.8	19	57.65	12	56.5	19	60.70	69	74.3	22	55.72	28	74.6
Dec. 6.1	24.68	7	18.6	22	57.58	7	54.2	23	60.13	57	71.7	26	55.50	22	71.9
16.0	24.70	2	16.3	23	57.56	2	51.7	25	59.70	43	68.7	30	55.36	14	68.9
26.0	24.81	11	13.9	24	57.58	2	48.9	28	59.42	28	65.4	33	55.29	7	65.7
36.0	25.01	20	11.4	25	57.66	8	46.0	29	59.31	11	62.0	34	55.30	1	62.2
Sec δ, Tan δ	2.150		−1.904		1.196		+0.656		3.950		+3.821		1.958		+1.683
Mean Place	20ˢ.655		10″.72		56ˢ.489		47″.96		67ˢ.425		62″.48		56ˢ.954		63″.03
$D'_\psi \alpha$, $D_\omega \alpha$	+0.05		+0.02		−0.02		−0.01		−0.10		−0.05		−0.04		−0.02
$D_\psi \delta$, $D_\omega \delta$	−0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

n Solar ate.	σ Sagittarii. Mag. 2.1				θ Serpentis *pr.* Mag. 4.5				R Lyræ. Var. 4.0–4.7				γ Lyræ. Mag. 3.3			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 18 49		° ′ −26 24		h m 18 51		° ′ +4 5		h m 18 52		° ′ +43 49		h m 18 55		° ′ +32 33	
	s		″		s		″		s		″		s		″	
1. 1.0	58.89	16	20.3	3	58.79	13	24.0	15	43.28	9	54.5	32	44.53	10	73.5	28
11.0	59.05	20	20.0	3	58.92	16	22.5	15	43.37	14	51.3	32	44.63	15	70.7	28
21.0	59.25	23	19.7	4	59.08	20	21.0	14	43.51	19	48.1	30	44.78	18	67.9	27
30.9	59.48	26	19.3	3	59.28	22	19.6	12	43.70	24	45.1	27	44.96	22	65.2	24
b. 9.9	59.74	29	19.0	4	59.50	25	18.4	10	43.94	27	42.4	23	45.18	25	62.8	20
19.9	60.03	31	18.6	4	59.75	26	17.4	7	44.21	31	40.1	18	45.43	28	60.8	16
r. 1.8	60.34	32	18.2	4	60.01	28	16.7	4	44.52	33	38.3	13	45.71	30	59.2	11
11.8	60.66	33	17.8	4	60.29	29	16.3	0	44.85	36	37.0	6	46.01	32	58.1	5
21.8	60.99	34	17.4	5	60.58	30	16.3	3	45.21	36	36.4	1	46.33	32	57.6	0
31.8	61.33	34	16.9	5	60.88	30	16.6	6	45.57	36	36.3	6	46.65	33	57.6	6
r. 10.7	61.67	34	16.4	6	61.18	30	17.2	9	45.93	36	36.9	11	46.98	32	58.2	11
20.7	62.01	34	15.8	5	61.48	29	18.1	12	46.29	35	38.0	17	47.30	31	59.3	16
30.7	62.35	32	15.3	5	61.77	28	19.3	15	46.64	32	39.7	22	47.61	30	60.9	20
ay 10.7	62.67	30	14.8	4	62.05	26	20.8	16	46.96	30	41.9	26	47.91	28	62.9	24
20.6	62.97	29	14.4	4	62.31	25	22.4	17	47.26	26	44.5	29	48.19	25	65.3	27
30.6	63.26	25	14.0	2	62.56	21	24.1	18	47.52	22	47.4	31	48.44	21	68.0	28
ne 9.6	63.51	22	13.8	2	62.77	19	25.9	18	47.74	17	50.5	33	48.65	18	70.8	30
19.5	63.73	17	13.6	0	62.96	15	27.7	18	47.91	12	53.8	33	48.83	13	73.8	30
29.5	63.90	14	13.6	1	63.11	11	29.5	17	48.03	7	57.1	32	48.96	8	76.8	29
ly 9.5	64.04	8	13.7	1	63.22	6	31.2	16	48.10	1	60.3	32	49.04	4	79.7	29
19.5	64.12	4	13.8	3	63.28	3	32.8	14	48.11	4	63.5	29	49.08	1	82.6	26
29.4	64.16	1	14.1	3	63.31	2	34.2	12	48.07	10	66.4	28	49.07	6	85.2	24
ug. 8.4	64.15	5	14.4	4	63.29	6	35.4	11	47.97	15	69.2	24	49.01	10	87.6	22
18.4	64.10	10	14.8	3	63.23	9	36.5	8	47.82	18	71.6	20	48.91	14	89.8	18
28.4	64.00	13	15.1	3	63.14	13	37.3	7	47.64	23	73.6	17	48.77	18	91.6	15
ept. 7.3	63.87	16	15.4	3	63.01	15	38.0	4	47.41	25	75.3	12	48.59	20	93.1	10
17.3	63.71	17	15.7	2	62.86	16	38.4	3	47.16	28	76.5	7	48.39	22	94.1	7
27.3	63.54	18	15.9	1	62.70	17	38.7	0	46.88	28	77.2	3	48.17	22	94.8	2
ct. 7.2	63.36	18	16.0	0	62.53	17	38.7	2	46.60	28	77.5	2	47.95	23	95.0	2
17.2	63.18	16	16.0	1	62.36	15	38.5	4	46.32	26	77.3	7	47.72	21	94.8	6
27.2	63.02	13	15.9	2	62.21	13	38.1	6	46.06	24	76.6	12	47.51	19	94.2	11
ov. 6.2	62.89	10	15.7	2	62.08	10	37.5	8	45.82	21	75.4	16	47.32	15	93.1	15
16.1	62.79	6	15.5	4	61.98	6	36.7	10	45.61	16	73.8	21	47.17	12	91.6	18
26.1	62.73	1	15.1	3	61.92	2	35.7	12	45.45	12	71.7	25	47.05	8	89.8	22
ec. 6.1	62.72	3	14.8	4	61.90	2	34.5	13	45.33	6	69.2	28	46.97	3	87.6	25
16.1	62.75	9	14.4	4	61.92	6	33.2	14	45.27	0	66.4	30	46.94	2	85.1	27
26.0	62.84	13	14.0	4	61.98	10	31.8	15	45.27	5	63.4	32	46.96	7	82.4	28
36.0	62.97		13.6		62.08		30.3		45.32		60.2		47.03		79.6	
c δ, Tan δ	1.116		−0.497		1.003		+0.071		1.386		+0.960		1.187		+0.639	
an Place	59ˢ.674		12″.19		59ˢ.617		31″.68		44ˢ.936		60″.89		45ˢ.811		80″.08	
ψα, D∞ α	+0.01		+0.01		0.00		0.00		−0.02		−0.01		−0.02		−0.01	
ψδ, D∞ δ	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**λ Pavonis.** Mag. 4.4				**β Lyræ.** Var. 3.4–4.1				**50 Draconis.** Mag. 5.4				**o Draconis.** Mag. 4.8			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 18 44		° ′ −62 17		h m 18 46		° ′ +33 15		h m 18 48		° ′ +75 19		h m 18 49		° ′ +59 16	
	s		″		s		″		s		″		s		″	
Jan. 1.0	18.92		18.4		55.20		40.8		61.31		56.7		54.28		56.9	
11.0	19.19	27	16.0	24	55.31	11	37.9	29	61.30	1	53.2	35	54.34	6	53.4	35
21.0	19.53	34	13.7	23	55.46	15	35.0	29	61.46	16	49.8	34	54.48	14	50.0	34
30.9	19.94	41	11.6	21	55.65	19	32.4	26	61.78	32	46.5	33	54.70	22	46.7	33
Feb. 9.9	20.41	47	9.6	20	55.88	23	30.0	24	62.25	47	43.5	30	54.99	29	43.8	[illegible]
19.9	20.93	52	7.9	17	56.14	26	28.0	20	62.85	60	41.0	25	55.34	35	41.3	[illegible]
Mar. 1.8	21.48	55	6.5	14	56.43	29	26.4	16	63.56	71	38.9	21	55.73	39	39.2	[illegible]
11.8	22.07	59	5.3	12	56.74	31	25.3	11	64.36	80	37.4	15	56.17	44	37.8	14
21.8	22.68	61	4.5	8	57.06	32	24.8	5	65.22	86	36.5	9	56.63	46	37.0	8
31.8	23.30	62	3.9	6	57.38	32	24.9	1	66.10	88	36.3	2	57.11	48	36.9	1
Apr. 10.7	23.92	62	3.7	2	57.71	33	25.5	6	66.98	88	36.8	5	57.59	48	37.4	5
20.7	24.53	61	3.8	1	58.03	32	26.7	12	67.83	85	37.9	11	58.05	46	38.6	12
30.7	25.13	60	4.2	4	58.34	31	28.4	17	68.62	79	39.5	16	58.49	44	40.3	17
May 10.7	25.69	56	4.9	7	58.64	30	30.5	21	69.33	71	41.7	22	58.90	41	42.6	[illegible]
20.6	26.21	52	5.9	10	58.91	27	32.9	24	69.94	61	44.4	27	59.26	36	45.3	27
30.6	26.69	48	7.2	13	59.15	24	35.6	27	70.43	49	47.4	30	59.57	31	48.3	30
June 9.6	27.11	42	8.8	16	59.36	21	38.5	29	70.78	35	50.6	32	59.81	24	51.6	[illegible]
19.5	27.46	35	10.5	17	59.52	16	41.4	29	70.99	21	54.1	35	59.99	18	55.1	35
29.5	27.73	27	12.5	20	59.65	13	44.4	30	71.06	7	57.6	35	60.09	10	58.6	35
July 9.5	27.92	19	14.5	20	59.72	7	47.4	30	70.98	8	61.1	35	60.12	3	62.1	35
19.5	28.02	10	16.6	21	59.75	3	50.2	28	70.75	23	64.5	34	60.07	5	65.5	34
29.4	28.03	1	18.6	20	59.72	3	52.8	26	70.37	38	67.7	32	59.95	12	68.7	32
Aug. 8.4	27.96	7	20.6	20	59.65	7	55.2	24	69.87	50	70.7	30	59.75	20	71.6	[illegible]
18.4	27.80	16	22.4	18	59.54	11	57.3	21	69.25	62	73.3	26	59.50	25	74.3	27
28.3	27.57	23	24.0	16	59.39	15	59.1	18	68.52	73	75.6	23	59.18	32	76.5	22
Sept. 7.3	27.27	30	25.2	12	59.21	18	60.5	14	67.70	82	77.5	19	58.82	36	78.3	18
17.3	26.93	34	26.1	9	59.00	21	61.5	10	66.82	88	78.9	14	58.42	40	79.7	14
27.3	26.56	37	26.6	5	58.78	22	62.0	5	65.89	93	79.9	10	58.00	42	80.5	8
Oct. 7.2	26.18	38	26.7	1	58.55	23	62.2	2	64.94	95	80.3	4	57.57	43	80.9	4
17.2	25.80	38	26.3	4	58.32	23	61.9	3	63.98	96	80.1	2	57.14	43	80.7	2
27.2	25.45	35	25.5	8	58.11	21	61.2	7	63.06	92	79.4	7	56.73	41	79.9	8
Nov. 6.2	25.15	30	24.3	12	57.92	19	60.0	12	62.19	87	78.2	12	56.34	39	78.6	13
16.1	24.91	24	22.7	16	57.77	15	58.4	16	61.39	80	76.5	17	56.00	34	76.9	17
26.1	24.75	16	20.8	19	57.65	12	56.5	19	60.70	69	74.3	22	55.72	28	74.6	23
Dec. 6.1	24.68	7	18.6	22	57.58	7	54.2	23	60.13	57	71.7	26	55.50	22	71.9	27
16.0	24.70	2	16.3	23	57.56	2	51.7	25	59.70	43	68.7	30	55.36	14	68.9	30
26.0	24.81	11	13.9	24	57.58	2	48.9	28	59.42	28	65.4	33	55.29	7	65.7	32
36.0	25.01	20	11.4	25	57.66	8	46.0	29	59.31	11	62.0	34	55.30	1	62.2	35
Sec δ, Tan δ	2.150		−1.904		1.196		+0.656		3.950		+3.821		1.958		+1.683	
Mean Place	$20^{s}.655$		$10''.72$		$56^{s}.489$		$47''.96$		$67^{s}.425$		$62''.48$		$56^{s}.954$		$63''.03$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.05		+0.02		−0.02		−0.01		−0.10		−0.05		−0.04		−0.02	
$D'_{\psi}\delta$, $D_{\omega}\delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

m Solar Date.	**σ Sagittarii.** Mag. 2.1				**θ Serpentis *pr*.** Mag. 4.5				**R Lyræ.** Var. 4.0–4.7				**γ Lyræ.** Mag. 3.3			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 18 49 s		° ′ −26 24 ″		h m 18 51 s		° ′ + 4 5 ″		h m 18 52 s		° ′ +43 49 ″		h m 18 55 s		° ′ +32 33 ″	
n. 1.0	58.89	16	20.3	3	58.79	13	24.0	15	43.28	9	54.5	32	44.53	10	73.5	28
11.0	59.05	20	20.0	3	58.92	16	22.5	15	43.37	14	51.3	32	44.63	15	70.7	28
21.0	59.25	23	19.7	4	59.08	20	21.0	14	43.51	19	48.1	30	44.78	18	67.9	27
30.9	59.48	26	19.3	3	59.28	22	19.6	12	43.70	24	45.1	27	44.96	22	65.2	24
:b. 9.9	59.74	29	19.0	4	59.50	25	18.4	10	43.94	27	42.4	23	45.18	25	62.8	20
19.9	60.03	31	18.6	4	59.75	26	17.4	7	44.21	31	40.1	18	45.43	28	60.8	16
ar. 1.8	60.34	32	18.2	4	60.01	28	16.7	4	44.52	33	38.3	13	45.71	30	59.2	11
11.8	60.66	33	17.8	4	60.29	29	16.3	0	44.85	36	37.0	6	46.01	32	58.1	5
21.8	60.99	34	17.4	5	60.58	30	16.3	3	45.21	36	36.4	1	46.33	32	57.6	0
31.8	61.33	34	16.9	5	60.88	30	16.6	6	45.57	36	36.3	6	46.65	33	57.6	6
pr. 10.7	61.67	34	16.4	6	61.18	30	17.2	9	45.93	36	36.9	11	46.98	32	58.2	11
20.7	62.01	34	15.8	5	61.48	29	18.1	12	46.29	35	38.0	17	47.30	31	59.3	16
30.7	62.35	32	15.3	5	61.77	28	19.3	15	46.64	32	39.7	22	47.61	30	60.9	20
lay 10.7	62.67	30	14.8	4	62.05	26	20.8	16	46.96	30	41.9	26	47.91	28	62.9	24
20.6	62.97	29	14.4	4	62.31	25	22.4	17	47.26	26	44.5	29	48.19	25	65.3	27
30.6	63.26	25	14.0	2	62.56	21	24.1	18	47.52	22	47.4	31	48.44	21	68.0	28
une 9.6	63.51	22	13.8	2	62.77	19	25.9	18	47.74	17	50.5	33	48.65	18	70.8	30
19.5	63.73	17	13.6	0	62.96	15	27.7	18	47.91	12	53.8	33	48.83	13	73.8	30
29.5	63.90	14	13.6	1	63.11	11	29.5	17	48.03	7	57.1	32	48.96	8	76.8	29
uly 9.5	64.04	8	13.7	1	63.22	6	31.2	16	48.10	1	60.3	32	49.04	4	79.7	29
19.5	64.12	4	13.8	3	63.28	3	32.8	14	48.11	4	63.5	29	49.08	1	82.6	26
29.4	64.16	1	14.1	3	63.31	2	34.2	12	48.07	10	66.4	28	49.07	6	85.2	24
lug. 8.4	64.15	5	14.4	4	63.29	6	35.4	11	47.97	15	69.2	24	49.01	10	87.6	22
18.4	64.10	10	14.8	3	63.23	9	36.5	8	47.82	18	71.6	20	48.91	14	89.8	18
28.4	64.00	13	15.1	3	63.14	13	37.3	7	47.64	23	73.6	17	48.77	18	91.6	15
ept. 7.3	63.87	16	15.4	3	63.01	15	38.0	4	47.41	25	75.3	12	48.59	20	93.1	10
17.3	63.71	17	15.7	2	62.86	16	38.4	3	47.16	28	76.5	7	48.39	22	94.1	7
27.3	63.54	18	15.9	1	62.70	17	38.7	0	46.88	28	77.2	3	48.17	22	94.8	2
)ct. 7.2	63.36	18	16.0	0	62.53	17	38.7	2	46.60	28	77.5	2	47.95	23	95.0	2
17.2	63.18	16	16.0	1	62.36	15	38.5	4	46.32	26	77.3	7	47.72	21	94.8	6
27.2	63.02	13	15.9	2	62.21	13	38.1	6	46.06	24	76.6	12	47.51	19	94.2	11
Nov. 6.2	62.89	10	15.7	2	62.08	10	37.5	8	45.82	21	75.4	16	47.32	15	93.1	15
16.1	62.79	6	15.5	4	61.98	6	36.7	10	45.61	16	73.8	21	47.17	12	91.6	18
26.1	62.73	1	15.1	3	61.92	2	35.7	12	45.45	12	71.7	25	47.05	8	89.8	22
Dec. 6.1	62.72	3	14.8	4	61.90	2	34.5	13	45.33	6	69.2	28	46.97	3	87.6	25
16.1	62.75	9	14.4	4	61.92	6	33.2	14	45.27	0	66.4	30	46.94	2	85.1	27
26.0	62.84	13	14.0	4	61.98	10	31.8	15	45.27	5	63.4	32	46.96	7	82.4	28
36.0	62.97		13.6		62.08		30.3		45.32		60.2		47.03		79.6	
ec δ, Tan δ	1.116		−0.497		1.003		+0.071		1.386		+0.960		1.187		+0.639	
lean Place	59ˢ.674		12″.19		59ˢ.617		31″.68		44ˢ.936		60″.89		45ˢ.811		80″.08	
$D_{\psi}\alpha$, $D_{\omega}\alpha$	+0.01		+0.01		0.00		0.00		−0.02		−0.01		−0.02		−0.01	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Aquilæ. Mag. 4.2				ζ Sagittarii. Mag. 2.7				ζ Aquilæ. Mag. 3.0				λ Aquilæ. Mag. 3.6		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S
	h m 18 55		° ′ +14 56		h m 18 57		° ′ −30 0		h m 19 1		° ′ +13 43		h m 19 1		° − 5
	s		″		s		″		s		″		s		″
Jan. 1.0	44.92	11	60.0	21	11.45	16	18.5	6	29.26	11	63.7	20	43.52	13	46.5
11.0	45.03	15	57.9	20	11.61	19	17.9	6	29.37	15	61.7	20	43.65	16	47.4
21.0	45.18	19	55.9	19	11.80	24	17.3	6	29.52	18	59.7	18	43.81	19	48.3
30.9	45.37	22	54.0	17	12.04	26	16.7	6	29.70	21	57.9	17	44.00	22	49.2
Feb. 9.9	45.59	24	52.3	14	12.30	29	16.1	5	29.91	24	56.2	14	44.22	25	49.9
19.9	45.83	26	50.9	11	12.59	31	15.6	6	30.15	26	54.8	10	44.47	26	50.4
Mar. 1.8	46.09	28	49.8	7	12.90	33	15.0	6	30.41	27	53.8	7	44.73	28	50.8
11.8	46.37	29	49.1	3	13.23	34	14.4	6	30.68	29	53.1	2	45.01	29	50.9
21.8	46.66	30	48.8	2	13.57	35	13.8	6	30.97	30	52.9	2	45.30	30	50.8
31.8	46.96	30	49.0	6	13.92	36	13.2	5	31.27	30	53.1	6	45.60	31	50.4
Apr. 10.7	47.26	30	49.6	10	14.28	35	12.7	6	31.57	30	53.7	10	45.91	30	49.8
20.7	47.56	29	50.6	14	14.63	34	12.1	5	31.87	30	54.7	13	46.21	30	48.9
30.7	47.85	29	52.0	17	14.97	34	11.6	4	32.17	28	56.0	17	46.51	29	47.9
May 10.7	48.14	26	53.7	20	15.31	32	11.2	4	32.45	27	57.7	19	46.80	28	46.7
20.6	48.40	24	55.7	21	15.63	29	10.8	2	32.72	25	59.6	21	47.08	26	45.3
30.6	48.64	22	57.8	23	15.92	27	10.6	1	32.97	21	61.7	23	47.34	23	43.9
June 9.6	48.86	18	60.1	23	16.19	23	10.5	0	33.18	19	64.0	22	47.57	20	42.6
19.5	49.04	14	62.4	23	16.42	19	10.5	1	33.37	15	66.2	23	47.77	16	41.2
29.5	49.18	11	64.7	23	16.61	15	10.6	3	33.52	11	68.5	22	47.93	13	39.9
July 9.5	49.29	6	67.0	21	16.76	9	10.9	4	33.63	7	70.7	21	48.06	8	38.7
19.5	49.35	1	69.1	19	16.85	5	11.3	4	33.70	2	72.8	19	48.14	4	37.6
29.4	49.36	2	71.0	18	16.90	0	11.7	5	33.72	2	74.7	17	48.18	0	36.6
Aug. 8.4	49.34	7	72.8	15	16.90	5	12.2	5	33.70	6	76.4	15	48.18.	5	35.8
18.4	49.27	11	74.3	13	16.85	10	12.7	5	33.64	10	77.9	13	48.13	8	35.1
28.4	49.16	13	75.6	10	16.75	13	13.2	5	33.54	13	79.2	10	48.05	12	34.6
Sept. 7.3	49.03	16	76.6	7	16.62	16	13.7	4	33.41	16	80.2	7	47.93	14	34.2
17.3	48.87	18	77.3	4	16.46	18	14.1	3	33.25	17	80.9	4	47.79	15	34.0
27.3	48.69	18	77.7	1	16.28	19	14.4	1	33.08	18	81.3	1	47.64	17	33.9
Oct. 7.2	48.51	18	77.8	2	16.09	18	14.5	0	32.90	17	81.4	2	47.47	16	33.9
17.2	48.33	16	77.6	5	15.91	17	14.5	1	32.73	17	81.2	4	47.31	15	34.1
27.2	48.17	15	77.1	9	15.74	14	14.4	2	32.56	14	80.8	8	47.16	13	34.3
Nov. 6.2	48.02	11	76.2	11	15.60	11	14.2	4	32.42	12	80.0	11	47.03	10	34.7
16.1	47.91	8	75.1	13	15.49	7	13.8	5	32.30	8	78.9	13	46.93	6	35.2
26.1	47.83	4	73.8	16	15.42	2	13.3	5	32.22	4	77.6	15	46.87	3	35.8
Dec. 6.1	47.79	0	72.2	19	15.40	3	12.8	6	32.18	0	76.1	17	46.84	2	36.6
16.1	47.79	5	70.3	19	15.43	8	12.2	6	32.18	4	74.4	19	46.86	6	37.4
26.0	47.84	8	68.4	21	15.51	12	11.6	6	32.22	8	72.5	20	46.92	10	38.3
36.0	47.92		66.3		15.63		11.0		32.30		70.5		47.02		39.2
Sec δ, Tan δ	1.035		+0.267		1.155		−0.577		1.029		+0.244		1.004		−0.088
Mean Place	45ˢ.857		67″.23		12ˢ.248		10″.14		30ˢ.184		70″.69		44ˢ.284		38″.72
D′ψ α, Dω α	−0.01		0.00		+0.01		+0.01		−0.01		0.00		0.00		0.00
Dψ δ, Dω δ	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	**α Coronæ Australis.** Mag. 4.1				**ι Lyræ.** Mag. 5.1				**π Sagittarii.** Mag. 3.0				**ψ Sagittarii.** Mag. 4.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 3		−38 2		19 4		+35 57		19 4		−21 9		19 10		−25 24	
	s		″		s		″		s		″		s		″	
an. 1.0	40.52		25.7		14.76		52.7		41.83		43.0		19.02		23.5	
11.0	40.68	16	24.6	11	14.85	9	49.7	30	41.97	14	42.9	1	19.16	14	23.1	4
21.0	40.89	21	23.5	11	14.97	12	46.8	29	42.15	18	42.8	1	19.33	17	22.7	4
30.9	41.14	25	22.4	11	15.15	18	44.1	27	42.36	21	42.7	1	19.54	21	22.3	4
eb. 9.9	41.42	28	21.4	10	15.36	21	41.6	25	42.60	24	42.6	1	19.78	24	21.9	4
19.9	41.73	31	20.4	10	15.61	25	39.4	22	42.86	26	42.4	2	20.05	27	21.5	4
ar. 1.9	42.06	33	19.5	9	15.89	28	37.7	17	43.14	28	42.1	3	20.34	29	21.0	5
11.8	42.42	36	18.6	9	16.19	30	36.5	12	43.45	31	41.7	4	20.65	31	20.4	6
21.8	42.79	37	17.8	8	16.51	32	35.8	7	43.76	31	41.2	5	20.98	33	19.8	6
31.8	43.17	38	17.1	7	16.84	33	35.7	1	44.08	32	40.6	6	21.31	33	19.2	6
pr. 10.7	43.55	38	16.5	6	17.18	34	36.2	5	44.41	33	40.0	6	21.64	33	18.5	7
20.7	43.93	38	16.0	5	17.52	34	37.3	11	44.74	33	39.3	7	21.98	34	17.8	7
30.7	44.31	38	15.6	4	17.84	32	38.9	16	45.06	32	38.5	8	22.32	34	17.0	8
ay 10.7	44.68	37	15.4	2	18.15	31	40.9	20	45.38	32	37.7	8	22.65	33	16.4	6
20.6	45.03	35	15.3	1	18.44	29	43.3	24	45.68	30	37.0	7	22.96	31	15.7	7
30.6	45.36	33	15.4	1	18.70	26	46.0	27	45.96	28	36.3	7	23.25	29	15.2	5
une 9.6	45.65	29	15.6	2	18.92	22	49.0	30	46.22	26	35.7	6	23.52	27	14.8	4
19.6	45.91	26	16.1	5	19.11	19	52.0	30	46.44	22	35.2	5	23.76	24	14.5	3
29.5	46.12	21	16.6	5	19.25	14	55.1	31	46.62	18	34.8	4	23.95	19	14.3	2
uly 9.5	46.28	16	17.3	7	19.34	9	58.2	31	46.77	15	34.5	3	24.11	16	14.2	1
19.5	46.39	11	18.1	8	19.38	4	61.2	30	46.86	9	34.3	2	24.21	10	14.3	1
29.4	46.45	6	19.0	9	19.37	1	64.0	28	46.92	6	34.2	1	24.27	6	14.5	2
Aug. 8.4	46.45	0	20.0	10	19.32	5	66.6	26	46.92	0	34.3	1	24.28	1	14.7	2
18.4	46.40	5	20.9	9	19.21	11	68.9	23	46.88	4	34.4	1	24.24	4	15.0	3
28.4	46.30	10	21.7	8	19.06	15	70.9	20	46.80	8	34.6	2	24.16	8	15.4	4
Sept. 7.3	46.15	15	22.5	8	18.88	18	72.5	16	46.68	12	34.8	2	24.05	11	15.8	4
17.3	45.98	17	23.1	6	18.67	21	73.7	12	46.54	14	35.0	2	23.90	15	16.1	3
27.3	45.78	20	23.6	5	18.44	23	74.5	8	46.37	17	35.1	1	23.73	17	16.3	2
Oct. 7.3	45.57	21	23.8	2	18.20	24	74.8	3	46.20	17	35.3	2	23.56	17	16.5	2
17.2	45.37	20	23.8	0	17.97	23	74.7	1	46.03	17	35.4	1	23.38	18	16.7	2
27.2	45.18	19	23.6	2	17.74	23	74.2	5	45.87	16	35.4	0	23.22	16	16.7	0
Nov. 6.2	45.01	17	23.2	4	17.54	20	73.2	10	45.73	14	35.5	1	23.07	15	16.6	1
16.1	44.88	13	22.6	6	17.36	18	71.7	15	45.63	10	35.4	1	22.96	11	16.5	1
26.1	44.80	8	21.8	8	17.22	14	69.8	19	45.57	6	35.3	1	22.89	7	16.2	3
Dec. 6.1	44.77	3	20.8	10	17.13	9	67.6	22	45.54	3	35.3	0	22.86	3	15.9	3
16.1	44.79	2	19.8	10	17.08	5	65.1	25	45.56	2	35.2	1	22.87	1	15.6	3
26.0	44.86	7	18.7	11	17.09	1	62.4	27	45.63	7	35.1	1	22.94	7	15.3	3
36.0	44.99	13	17.6	11	17.14	5	59.5	29	45.74	11	35.0	1	23.04	10	14.9	4
Sec δ, Tan δ	1.270		−0.782		1.235		+0.726		1.072		−0.387		1.107		−0.475	
Mean Place	41ˢ.391		17″.11		16ˢ.137		58″.48		42ˢ.575		34″.72		19ˢ.768		15″.01	
$D'_\psi \alpha$, $D_\omega \alpha$	+0.02		+0.01		−0.02		−0.01		+0.01		+0.01		+0.01		+0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ε Aquilæ. Mag. 4.2				ζ Sagittarii. Mag. 2.7				ζ Aquilæ. Mag. 3.0				λ Aquilæ. Mag. 3.6		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	18 55		+14 56		18 57		−30 0		19 1		+13 43		19 1		− 5
	s		″		s		″		s		″		s		″
Jan. 1.0	44.92	11	60.0	21	11.45	16	18.5	6	29.26	11	63.7	20	43.52	13	46.5
11.0	45.03	15	57.9	20	11.61	19	17.9	6	29.37	15	61.7	20	43.65	16	47.4
21.0	45.18	19	55.9	19	11.80	24	17.3	6	29.52	18	59.7	18	43.81	19	48.3
30.9	45.37	22	54.0	17	12.04	26	16.7	6	29.70	21	57.9	17	44.00	22	49.2
Feb. 9.9	45.59	24	52.3	14	12.30	29	16.1	5	29.91	24	56.2	14	44.22	25	49.9
19.9	45.83	26	50.9	11	12.59	31	15.6	6	30.15	26	54.8	10	44.47	26	50.4
Mar. 1.8	46.09	28	49.8	7	12.90	33	15.0	6	30.41	27	53.8	7	44.73	28	50.8
11.8	46.37	29	49.1	3	13.23	34	14.4	6	30.68	29	53.1	2	45.01	29	50.9
21.8	46.66	30	48.8	2	13.57	35	13.8	6	30.97	30	52.9	2	45.30	30	50.8
31.8	46.96	30	49.0	6	13.92	36	13.2	5	31.27	30	53.1	6	45.60	31	50.4
Apr. 10.7	47.26	30	49.6	10	14.28	35	12.7	6	31.57	30	53.7	10	45.91	30	49.8
20.7	47.56	29	50.6	14	14.63	34	12.1	5	31.87	30	54.7	13	46.21	30	48.9
30.7	47.85	29	52.0	17	14.97	34	11.6	4	32.17	28	56.0	17	46.51	29	47.9
May 10.7	48.14	26	53.7	20	15.31	32	11.2	4	32.45	27	57.7	19	46.80	28	46.7
20.6	48.40	24	55.7	21	15.63	29	10.8	2	32.72	25	59.6	21	47.08	26	45.3
30.6	48.64	22	57.8	23	15.92	27	10.6	1	32.97	21	61.7	23	47.34	23	43.9
June 9.6	48.86	18	60.1	23	16.19	23	10.5	0	33.18	19	64.0	22	47.57	20	42.6
19.5	49.04	14	62.4	23	16.42	19	10.5	1	33.37	15	66.2	23	47.77	16	41.2
29.5	49.18	11	64.7	23	16.61	15	10.6	3	33.52	11	68.5	22	47.93	13	39.9
July 9.5	49.29	6	67.0	21	16.76	9	10.9	4	33.63	7	70.7	21	48.06	8	38.7
19.5	49.35	1	69.1	19	16.85	5	11.3	4	33.70	2	72.8	19	48.14	4	37.6
29.4	49.36	2	71.0	18	16.90	0	11.7	5	33.72	2	74.7	17	48.18	0	36.6
Aug. 8.4	49.34	7	72.8	15	16.90	5	12.2	5	33.70	6	76.4	15	48.18.	5	35.8
18.4	49.27	11	74.3	13	16.85	10	12.7	5	33.64	10	77.9	13	48.13	8	35.1
28.4	49.16	13	75.6	10	16.75	13	13.2	5	33.54	13	79.2	10	48.05	12	34.6
Sept. 7.3	49.03	16	76.6	7	16.62	16	13.7	4	33.41	16	80.2	7	47.93	14	34.2
17.3	48.87	18	77.3	4	16.46	18	14.1	3	33.25	17	80.9	4	47.79	15	34.0
27.3	48.69	18	77.7	1	16.28	19	14.4	1	33.08	18	81.3	1	47.64	17	33.9
Oct. 7.2	48.51	18	77.8	2	16.09	18	14.5	0	32.90	17	81.4	2	47.47	16	33.9
17.2	48.33	16	77.6	5	15.91	17	14.5	1	32.73	17	81.2	4	47.31	15	34.1
27.2	48.17	15	77.1	9	15.74	14	14.4	2	32.56	14	80.8	8	47.16	13	34.3
Nov. 6.2	48.02	11	76.2	11	15.60	11	14.2	4	32.42	12	80.0	11	47.03	10	34.7
16.1	47.91	8	75.1	13	15.49	7	13.8	5	32.30	8	78.9	13	46.93	6	35.2
26.1	47.83	4	73.8	16	15.42	2	13.3	5	32.22	4	77.6	15	46.87	3	35.8
Dec. 6.1	47.79	0	72.2	19	15.40	3	12.8	6	32.18	0	76.1	17	46.84	2	36.6
16.1	47.79	5	70.3	19	15.43	8	12.2	6	32.18	4	74.4	19	46.86	6	37.4
26.0	47.84	8	68.4	21	15.51	12	11.6	6	32.22	8	72.5	20	46.92	10	38.3
36.0	47.92		66.3		15.63		11.0		32.30		70.5		47.02		39.2
Sec δ, Tan δ	1.035		+0.267		1.155		−0.577		1.029		+0.244		1.004		−0.088
Mean Place	45ˢ.857		67″.23		12ˢ.248		10″.14		30ˢ.184		70″.69		44ˢ.284		38″.72
D′ψ α, Dω α	−0.01		0.00		+0.01		+0.01		−0.01		0.00		0.00		0.00
Dψ δ, Dω δ	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0

ean Solar Date.	**α Coronæ Australis.** Mag. 4.1				**ι Lyræ.** Mag. 5.1				**π Sagittarii.** Mag. 3.0				**ψ Sagittarii.** Mag. 4.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 3		−38 2		19 4		+35 57		19 4		−21 9		19 10		−25 24	
	s		″		s		″		s		″		s		″	
an. 1.0	40.52		25.7		14.76		52.7		41.83		43.0		19.02		23.5	
11.0	40.68	16	24.6	11	14.85	9	49.7	30	41.97	14	42.9	1	19.16	14	23.1	4
21.0	40.89	21	23.5	11	14.97	12	46.8	29	42.15	18	42.8	1	19.33	17	22.7	4
30.9	41.14	25	22.4	11	15.15	18	44.1	27	42.36	21	42.7	1	19.54	21	22.3	4
eb. 9.9	41.42	28	21.4	10	15.36	21	41.6	25	42.60	24	42.6	1	19.78	24	21.9	4
19.9	41.73	31	20.4	10	15.61	25	39.4	22	42.86	26	42.4	2	20.05	27	21.5	4
ar. 1.9	42.06	33	19.5	9	15.89	28	37.7	17	43.14	28	42.1	3	20.34	29	21.0	5
11.8	42.42	36	18.6	9	16.19	30	36.5	12	43.45	31	41.7	4	20.65	31	20.4	6
21.8	42.79	37	17.8	8	16.51	32	35.8	7	43.76	31	41.2	5	20.98	33	19.8	6
31.8	43.17	38	17.1	7	16.84	33	35.7	1	44.08	32	40.6	6	21.31	33	19.2	6
pr. 10.7	43.55	38	16.5	6	17.18	34	36.2	5	44.41	33	40.0	6	21.64	33	18.5	7
20.7	43.93	38	16.0	5	17.52	34	37.3	11	44.74	33	39.3	7	21.98	34	17.8	7
30.7	44.31	38	15.6	4	17.84	32	38.9	16	45.06	32	38.5	8	22.32	34	17.0	8
ay 10.7	44.68	37	15.4	2	18.15	31	40.9	20	45.38	32	37.7	8	22.65	33	16.4	6
20.6	45.03	35	15.3	1	18.44	29	43.3	24	45.68	30	37.0	7	22.96	31	15.7	7
30.6	45.36	33	15.4	1	18.70	26	46.0	27	45.96	28	36.3	7	23.25	29	15.2	5
une 9.6	45.65	29	15.6	2	18.92	22	49.0	30	46.22	26	35.7	6	23.52	27	14.8	4
19.6	45.91	26	16.1	5	19.11	19	52.0	30	46.44	22	35.2	5	23.76	24	14.5	3
29.5	46.12	21	16.6	5	19.25	14	55.1	31	46.62	18	34.8	4	23.95	19	14.3	2
uly 9.5	46.28	16	17.3	7	19.34	9	58.2	31	46.77	15	34.5	3	24.11	16	14.2	1
19.5	46.39	11	18.1	8	19.38	4	61.2	30	46.86	9	34.3	2	24.21	10	14.3	1
29.4	46.45	6	19.0	9	19.37	1	64.0	28	46.92	6	34.2	1	24.27	6	14.5	2
ug. 8.4	46.45	0	20.0	10	19.32	5	66.6	26	46.92	0	34.3	1	24.28	1	14.7	2
18.4	46.40	5	20.9	9	19.21	11	68.9	23	46.88	4	34.4	1	24.24	4	15.0	3
28.4	46.30	10	21.7	8	19.06	15	70.9	20	46.80	8	34.6	2	24.16	8	15.4	4
Sept. 7.3	46.15	15	22.5	8	18.88	18	72.5	16	46.68	12	34.8	2	24.05	11	15.8	4
17.3	45.98	17	23.1	6	18.67	21	73.7	12	46.54	14	35.0	2	23.90	15	16.1	3
27.3	45.78	20	23.6	5	18.44	23	74.5	8	46.37	17	35.1	1	23.73	17	16.3	2
Oct. 7.3	45.57	21	23.8	2	18.20	24	74.8	3	46.20	17	35.3	2	23.56	17	16.5	2
17.2	45.37	20	23.8	0	17.97	23	74.7	1	46.03	17	35.4	1	23.38	18	16.7	2
27.2	45.18	19	23.6	2	17.74	23	74.2	5	45.87	16	35.4	0	23.22	16	16.7	0
Nov. 6.2	45.01	17	23.2	4	17.54	20	73.2	10	45.73	14	35.5	1	23.07	15	16.6	1
16.1	44.88	13	22.6	6	17.36	18	71.7	15	45.63	10	35.4	1	22.96	11	16.5	1
26.1	44.80	8	21.8	8	17.22	14	69.8	19	45.57	6	35.3	1	22.89	7	16.2	3
Dec. 6.1	44.77	3	20.8	10	17.13	9	67.6	22	45.54	3	35.3	0	22.86	3	15.9	3
16.1	44.79	2	19.8	10	17.08	5	65.1	25	45.56	2	35.2	1	22.87	1	15.6	3
26.0	44.86	7	18.7	11	17.09	1	62.4	27	45.63	7	35.1	1	22.94	7	15.3	3
36.0	44.99	13	17.6	11	17.14	5	59.5	29	45.74	11	35.0	1	23.04	10	14.9	4
ec δ, Tan δ	1.270		−0.782		1.235		+0.726		1.072		−0.387		1.107		−0.475	
ean Place	41ˢ.391		17″.11		16ˢ.137		58″.48		42ˢ.575		34″.72		19ˢ.768		15″.01	
$\psi\,a$, $D_\omega\,a$	+0.02		+0.01		−0.02		−0.01		+0.01		+0.01		+0.01		+0.01	
$\psi\,\delta$, $D_\omega\,\delta$	+0.1		−1.0		+0.1		−1.0		+0.1		−1.0		+0.1		−1.0	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Draconis. Mag. 3.2 Right Ascension.		δ Draconis. Declination N.		d Sagittarii. Mag. 5.0 Right Ascension.		d Sagittarii. Declination S.		θ Lyræ. Mag. 4.5 Right Ascension.		θ Lyræ. Declination N.		ω Aquilæ. Mag. 5.1 Right Ascension.		ω Aquilæ. Declination N.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	19 12		+67 30		19 12		−19 6		19 13		+37 58		19 13		+11 2
	s		″		s		″		s		″		s		″
Jan. 1.0	28.49		39.7		39.01		26.6		23.58		49.5		48.71		22.2
11.0	28.47	2	36.2	35	39.13	12	26.6	0	23.65	7	46.6	29	48.81	10	20.3
21.0	28.56	9	32.8	34	39.30	17	26.6	0	23.77	12	43.6	30	48.95	14	18.5
30.9	28.76	20	29.4	34	39.50	20	26.6	0	23.93	16	40.8	28	49.12	17	16.8
Feb. 9.9	29.05	29	26.3	31	39.73	23	26.5	1	24.14	21	38.2	26	49.32	20	15.3
19.9	29.44	39	23.6	27	39.98	25	26.4	1	24.38	24	35.9	23	49.55	23	14.0
Mar. 1.9	29.90	46	21.3	23	40.26	28	26.1	3	24.66	28	34.1	18	49.80	25	13.0
11.8	30.43	53	19.6	17	40.55	29	25.7	4	24.96	30	32.8	13	50.07	27	12.4
21.8	31.00	57	18.5	11	40.86	31	25.2	5	25.28	32	32.1	7	50.35	28	12.2
31.8	31.60	60	18.0	5	41.17	31	24.6	6	25.62	34	31.9	2	50.65	30	12.4
Apr. 10.7	32.22	62	18.2	2	41.50	33	23.9	7	25.96	34	32.3	4	50.95	30	13.0
20.7	32.82	60	19.1	9	41.82	32	23.1	8	26.30	34	33.3	10	51.25	30	14.0
30.7	33.40	58	20.5	14	42.15	33	22.3	8	26.64	34	34.9	16	51.55	30	15.3
May 10.7	33.94	54	22.6	21	42.46	31	21.4	9	26.96	32	36.8	19	51.84	29	16.9
20.6	34.42	48	25.1	25	42.76	30	20.6	8	27.26	30	39.2	24	52.11	27	18.8
30.6	34.83	41	28.0	29	43.04	28	19.7	9	27.53	27	42.0	28	52.37	26	20.9
June 9.6	35.16	33	31.2	32	43.30	26	19.0	7	27.77	24	44.9	29	52.60	23	23.0
19.6	35.40	24	34.7	35	43.52	22	18.3	7	27.96	19	48.0	31	52.80	20	25.2
29.5	35.55	15	38.2	35	43.71	19	17.7	6	28.11	15	51.2	32	52.96	16	27.4
July 9.5	35.60	5	41.8	36	43.86	15	17.3	4	28.21	10	54.4	32	53.08	12	29.5
19.5	35.55	5	45.4	36	43.97	11	17.0	3	28.25	4	57.5	31	53.16	8	31.5
29.4	35.39	16	48.8	34	44.02	5	16.8	2	28.25	0	60.4	29	53.20	4	33.4
Aug. 8.4	35.15	24	51.9	31	44.03	1	16.7	1	28.20	5	63.1	27	53.19	1	35.1
18.4	34.82	33	54.8	29	44.00	3	16.7	0	28.10	10	65.5	24	53.14	5	36.5
28.4	34.41	41	57.4	26	43.93	7	16.8	1	27.95	15	67.6	21	53.06	8	37.7
Sept. 7.3	33.93	48	59.6	22	43.82	11	16.9	1	27.77	18	69.4	18	52.94	12	38.7
17.3	33.40	53	61.3	17	43.68	14	17.1	2	27.56	21	70.7	13	52.79	15	39.4
27.3	32.83	57	62.6	13	43.52	16	17.3	2	27.33	23	71.6	9	52.63	16	39.9
Oct. 7.3	32.24	59	63.3	7	43.35	17	17.4	1	27.08	25	72.1	5	52.45	18	40.0
17.2	31.64	60	63.5	2	43.18	17	17.6	2	26.83	25	72.1	0	52.28	17	39.9
27.2	31.05	59	63.1	4	43.02	16	17.7	1	26.60	23	71.6	5	52.12	16	39.5
Nov. 6.2	30.49	56	62.2	9	42.89	13	17.7	0	26.38	22	70.7	9	51.97	15	38.8
16.1	29.97	52	60.8	14	42.78	11	17.8	1	26.19	19	69.3	14	51.85	12	37.9
26.1	29.52	45	58.8	20	42.71	7	17.8	0	26.04	15	67.5	18	51.77	8	36.8
Dec. 6.1	29.15	37	56.4	24	42.68	3	17.9	1	25.93	11	65.3	22	51.72	5	35.4
16.1	28.86	29	53.6	28	42.69	1	17.9	0	25.87	6	62.8	25	51.71	1	33.8
26.0	28.67	19	50.5	31	42.75	6	17.9	0	25.86	1	60.1	27	51.74	3	32.1
36.0	28.59	8	47.1	34	42.85	10	17.9	0	25.89	3	57.2	29	51.82	8	30.3
Sec δ, Tan δ	2.614		+2.415		1.058		−0.346		1.269		+0.781		1.020		+0.202
Mean Place	32ˢ.370		43″.19		39ˢ.736		18″.35		25ˢ.026		54″.54		49ˢ.604		28″.76
D′ψ α, Dω α	−0.06		−0.05		+0.01		+0.01		−0.02		−0.02		−0.01		0.00
Dψ δ, Dω δ	+0.1		−1.0		+0.1		−1.0		+0.1		−0.9		+0.1		−0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	κ Cygni. Mag. 4.0				τ Draconis. Mag. 4.6				δ Aquilæ. Mag. 3.4				β Cygni. Mag. 3.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 19 15		° ′ +53 12		h m 19 17		° ′ +73 11		h m 19 21		° ′ + 2 56		h m 19 27		° ′ +27 46	
	s		″		s		″		s		″		s		″	
an. 1.0	6.15		36.4		6.43		50.1		11.97		33.3		16.43		44.8	
11.0	6.19	4	33.1	33	6.35	8	46.7	34	12.07	10	31.9	14	16.50	7	42.3	25
21.0	6.29	10	29.7	34	6.41	6	43.3	34	12.21	14	30.6	13	16.61	11	39.7	26
30.9	6.46	17	26.5	32	6.62	21	39.9	34	12.38	17	29.4	12	16.76	15	37.3	24
eb. 9.9	6.69	23	23.6	29	6.96	34	36.8	31	12.58	20	28.3	11	16.95	19	35.0	23
19.9	6.97	28	21.0	26	7.43	47	34.0	28	12.80	22	27.4	9	17.17	22	33.1	19
Iar. 1.9	7.30	33	18.8	22	8.00	57	31.7	23	13.05	25	26.8	6	17.42	25	31.5	16
11.8	7.66	36	17.2	16	8.66	66	29.9	18	13.32	27	26.4	4	17.69	27	30.4	11
21.8	8.06	40	16.2	10	9.39	73	28.7	12	13.60	28	26.4	0	17.98	29	29.8	6
31.8	8.47	41	15.9	3	10.16	77	28.1	6	13.89	29	26.8	4	18.29	31	29.7	1
pr. 10.8	8.89	42	16.2	3	10.94	78	28.2	1	14.19	30	27.4	6	18.60	31	30.1	4
20.7	9.31	42	17.1	9	11.72	78	29.0	8	14.49	30	28.4	10	18.92	32	31.0	9
30.7	9.72	41	18.6	15	12.46	74	30.3	13	14.79	30	29.6	12	19.24	32	32.4	14
ay 10.7	10.10	38	20.7	21	13.15	69	32.3	20	15.08	29	31.1	15	19.55	31	34.2	18
20.6	10.46	36	23.2	25	13.76	61	34.7	24	15.37	29	32.7	16	19.84	29	36.4	22
30.6	10.77	31	26.1	29	14.27	51	37.5	28	15.63	26	34.4	17	20.11	27	38.9	25
June 9.6	11.03	26	29.3	32	14.68	41	40.7	32	15.87	24	36.2	18	20.35	24	41.6	27
19.6	11.24	21	32.6	33	14.97	29	44.1.	34	16.08	21	38.1	19	20.56	21	44.4	28
29.5	11.39	15	36.1	35	15.13	16	47.6	35	16.25	17	39.9	18	20.73	17	47.3	29
July 9.5	11.47	8	39.6	35	15.17	4	51.2	36	16.39	14	41.6	17	20.85	12	50.1	28
19.5	11.49	2	43.1	35	15.07	10	54.8	36	16.48	9	43.2	16	20.93	8	52.9	28
29.5	11.45	4	46.4	33	14.85	22	58.2	34	16.53	5	44.7	15	20.96	3	55.6	27
Aug. 8.4	11.34	11	49.4	30	14.50	35	61.4	32	16.54	1	45.9	12	20.94	2	58.0	24
18.4	11.17	17	52.2	28	14.04	46	64.4	30	16.51	3	47.0	11	20.88	6	60.2	22
28.4	10.94	23	54.7	25	13.48	56	67.0	26	16.44	7	47.9	9	20.78	10	62.1	19
Sept. 7.3	10.67	27	56.7	20	12.83	65	69.3	23	16.33	11	48.6	7	20.64	14	63.7	16
17.3	10.36	31	58.3	16	12.11	72	71.1	18	16.20	13	49.1	5	20.47	17	64.9	12
27.3	10.03	33	59.5	12	11.34	77	72.5	14	16.04	16	49.4	3	20.28	19	65.8	9
Oct. 7.3	9.68	35	60.1	6	10.53	81	73.3	8	15.88	16	49.5	1	20.07	21	66.2	4
17.2	9.32	36	60.2	1	9.71	82	73.7	4	15.71	17	49.4	1	19.87	20	66.3	1
27.2	8.98	34	59.8	4	8.90	81	73.4	3	15.56	15	49.1	3	19.67	20	65.9	4
Nov. 6.2	8.66	32	58.9	9	8.13	77	72.6	8	15.42	14	48.6	5	19.49	18	65.2	7
16.2	8.37	29	57.5	14	7.41	72	71.3	13	15.31	11	47.9	7	19.33	16	64.1	11
26.1	8.13	24	55.5	20	6.76	65	69.4	19	15.23	8	47.0	9	19.21	12	62.5	16
Dec. 6.1	7.94	19	53.2	23	6.21	55	67.1	23	15.19	4	46.0	10	19.12	9	60.7	18
16.1	7.80	14	50.4	28	5.78	43	64.4	27	15.18	1	44.8	12	19.07	5	58.6	21
26.0	7.73	7	47.4	30	5.47	31	61.3	31	15.22	4	43.6	12	19.07	0	56.3	23
36.0	7.73	0	44.1	33	5.30	17	58.0	33	15.29	7	42.3	13	19.11	4	53.8	25
ec δ, Tan δ	1.670		+1.337		3.459		+3.312		1.001		+0.051		1.130		+0.527	
ean Place	8ˢ.354		40″.35		11ˢ.809		52″.90		12ˢ.769		40″.13		17ˢ.588		49″.51	
D′ψ α, Dω α	−0.03		−0.03		−0.08		−0.07		0.00		0.00		−0.01		−0.01	
Dψ δ, Dω δ	+0.1		−0.9		+0.1		−0.9		+0.1		−0.9		+0.1		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ι Cygni.** Mag. 3.9				**μ Aquilæ.** Mag. 4.6				**h Sagittarii.** Mag. 4.7				**κ Aquilæ.** Mag. 5.0		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.
	h m		° ′		h m		° ′		h m		° ′		h m		° ′
	19 27		+51 32		19 29		+ 7 11		19 31		−25 4		19 32		− 7 12
	s		″		s		″		s		″		s		″
Jan. 1.0	31.72		50.8		55.42		45.8		31.45		28.4		18.46		69.2
11.0	31.74	2	47.6	32	55.51	9	44.2	16	31.56	11	28.0	4	18.56	10	69.9
21.0	31.83	9	44.3	33	55.64	13	42.7	15	31.71	15	27.6	4	18.69	13	70.6
31.0	31.98	15	41.1	32	55.80	16	41.3	14	31.90	19	27.1	5	18.86	17	71.2
Feb. 9.9	32.18	20	38.2	29	55.99	19	40.0	13	32.12	22	26.6	5	19.06	20	71.7
19.9	32.44	26	35.5	27	56.20	21	38.9	11	32.37	25	26.0	6	19.28	22	72.1
Mar. 1.9	32.75	31	33.3	22	56.44	24	38.1	8	32.64	27	25.4	6	19.52	24	72.3
11.8	33.09	34	31.7	16	56.70	26	37.6	5	32.94	30	24.7	7	19.79	27	72.2
21.8	33.46	37	30.6	11	56.98	28	37.5	1	33.25	31	24.0	7	20.07	28	71.9
31.8	33.86	40	30.1	5	57.26	28	37.7	2	33.57	32	23.1	9	20.37	30	71.4
Apr. 10.8	34.27	41	30.3	2	57.56	30	38.3	6	33.91	34	22.2	9	20.67	30	70.6
20.7	34.68	41	31.1	8	57.86	30	39.3	10	34.25	34	21.4	8	20.98	31	69.7
30.7	35.08	40	32.5	14	58.17	31	40.6	13	34.59	34	20.5	9	21.29	31	68.6
May 10.7	35.47	39	34.4	19	58.46	29	42.1	15	34.92	33	19.6	9	21.59	30	67.3
20.7	35.82	35	36.9	25	58.75	29	43.9	18	35.24	32	18.8	8	21.88	29	65.9
30.6	36.14	32	39.7	28	59.02	27	45.8	19	35.55	31	18.1	7	22.16	28	64.5
June 9.6	36.42	28	42.8	31	59.26	24	47.8	20	35.83	28	17.5	6	22.41	25	63.1
19.6	36.64	22	46.1	33	59.47	21	49.8	20	36.08	25	17.1	4	22.64	23	61.7
29.5	36.81	17	49.6	35	59.65	18	51.8	20	36.30	22	16.8	3	22.84	20	60.4
July 9.5	36.91	10	53.1	35	59.79	14	53.8	20	36.47	17	16.6	2	22.99	15	59.2
19.5	36.96	5	56.6	35	59.89	10	55.6	18	36.60	13	16.6	0	23.10	11	58.2
29.5	36.94	2	59.9	33	59.95	6	57.3	17	36.68	8	16.7	1	23.17	7	57.3
Aug. 8.4	36.85	9	63.0	31	59.96	1	58.9	16	36.71	3	17.0	3	23.20	3	56.5
18.4	36.71	14	65.9	29	59.93	3	60.2	13	36.69	2	17.3	3	23.18	2	55.9
28.4	36.51	20	68.4	25	59.86	7	61.3	11	36.63	6	17.7	4	23.12	6	55.4
Sept. 7.4	36.27	24	70.6	22	59.75	11	62.1	8	36.52	11	18.1	4	23.02	10	55.1
17.3	35.98	29	72.3	17	59.62	13	62.8	7	36.39	13	18.5	4	22.89	13	54.9
27.3	35.67	31	73.6	13	59.47	15	63.2	4	36.23	16	18.9	4	22.75	14	54.9
Oct. 7.3	35.35	32	74.4	8	59.31	16	63.3	1	36.06	17	19.2	3	22.59	16	54.9
17.2	35.01	34	74.7	3	59.14	17	63.3	0	35.88	18	19.4	2	22.43	16	55.1
27.2	34.69	32	74.4	3	58.98	16	63.0	3	35.71	17	19.5	1	22.28	15	55.3
Nov. 6.2	34.38	31	73.7	7	58.84	14	62.4	6	35.56	15	19.5	0	22.14	14	55.7
16.2	34.10	28	72.4	13	58.72	12	61.7	7	35.44	12	19.5	0	22.03	11	56.1
26.1	33.86	24	70.6	18	58.63	9	60.7	10	35.36	8	19.3	2	21.94	9	56.6
Dec. 6.1	33.66	20	68.4	22	58.57	6	59.5	12	35.31	5	19.0	3	21.90	4	57.1
16.1	33.52	14	65.8	26	58.56	1	58.2	13	35.30	1	18.7	3	21.89	1	57.7
26.1	33.44	8	62.8	30	58.58	2	56.8	14	35.34	4	18.4	3	21.92	3	58.4
36.0	33.43	1	59.7	31	58.64	6	55.2	16	35.43	9	18.0	4	22.00	8	59.2
Sec δ, Tan δ	1.608		+1.259		1.008		+0.126		1.104		−0.468		1.008		−0.127
Mean Place	$33^{s}.809$		$53''.71$		$56^{s}.251$		$52''.05$		$32^{s}.153$		$19''.74$		$19^{s}.180$		$61''.86$
$D'_{\psi}a$, $D_{\omega}a$	−0.03		−0.03		0.00		0.00		+0.01		+0.01		0.00		0.00
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.1		−0.9		+0.2		−0.9		+0.2		−0.9		+0.2		−0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	θ Cygni. Mag. 4.6				54 Sagittarii. Mag. 5.4				β Sagittæ. Mag. 4.4				15 Cygni. Mag. 5.0			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 19 34		° ′ +50 1		h m 19 35		° ′ −16 29		h m 19 37		° ′ +17 16		h m 19 41		° ′ +37 8	
	s		″		s		″		s		″		s		″	
an. 1.0	7.75	2	23.2	32	50.60	10	28.6	1	12.91	7	37.2	21	11.30	4	51.9	28
11.0	7.77	8	20.0	32	50.70	14	28.7	1	12.98	11	35.1	20	11.34	9	49.1	29
21.0	7.85	14	16.8	32	50.84	18	28.8	0	13.09	14	33.1	19	11.43	13	46.2	28
31.0	7.99	19	13.6	29	51.02	20	28.8	0	13.23	18	31.2	18	11.56	17	43.4	26
eb. 9.9	8.18	25	10.7	27	51.22	23	28.8	2	13.41	21	29.4	16	11.73	21	40.8	23
19.9	8.43	29	8.0	22	51.45	25	28.6	2	13.62	23	27.8	12	11.94	25	38.5	19
ar. 1.9	8.72	33	5.8	17	51.70	28	28.4	4	13.85	26	26.6	8	12.19	28	36.6	14
11.8	9.05	36	4.1	11	51.98	29	28.0	6	14.11	28	25.8	4	12.47	31	35.2	10
21.8	9.41	38	3.0	5	52.27	30	27.4	7	14.39	29	25.4	0	12.78	32	34.2	3
31.8	9.79	40	2.5	2	52.57	32	26.7	9	14.68	30	25.4	5	13.10	34	33.9	2
pr. 10.8	10.19	40	2.7	7	52.89	32	25.8	9	14.98	30	25.9	10	13.44	35	34.1	8
20.7	10.59	40	3.4	14	53.21	32	24.9	10	15.28	31	26.9	13	13.79	34	34.9	13
30.7	10.99	38	4.8	19	53.53	32	23.9	11	15.59	30	28.2	17	14.13	33	36.2	18
May 10.7	11.37	35	6.7	23	53.85	31	22.8	11	15.89	29	29.9	20	14.46	32	38.0	23
20.7	11.72	32	9.0	28	54.16	29	21.7	11	16.18	27	31.9	22	14.78	29	40.3	26
30.6	12.04	28	11.8	31	54.45	27	20.6	10	16.45	25	34.1	23	15.07	26	42.9	29
June 9.6	12.32	23	14.9	33	54.72	24	19.6	9	16.70	21	36.4	25	15.33	23	45.8	30
19.6	12.55	18	18.2	34	54.96	21	18.7	8	16.91	18	38.9	25	15.56	18	48.8	32
29.5	12.73	11	21.6	35	55.17	16	17.9	7	17.09	14	41.4	25	15.74	13	52.0	32
July 9.5	12.84	6	25.1	34	55.33	12	17.2	5	17.23	10	43.9	23	15.87	8	55.2	31
19.5	12.90	1	28.5	34	55.45	8	16.7	4	17.33	5	46.2	22	15.95	4	58.3	31
29.5	12.89	7	31.9	31	55.53	4	16.3	3	17.38	1	48.4	21	15.99	2	61.4	28
Aug. 8.4	12.82	12	35.0	29	55.57	2	16.0	1	17.39	3	50.5	18	15.97	7	64.2	26
18.4	12.70	18	37.9	26	55.55	6	15.9	0	17.36	8	52.3	15	15.90	12	66.8	23
28.4	12.52	23	40.5	22	55.49	9	15.9	1	17.28	11	53.8	13	15.78	15	69.1	20
Sept. 7.4	12.29	26	42.7	18	55.40	12	16.0	1	17.17	14	55.1	10	15.63	19	71.1	16
17.3	12.03	29	44.5	13	55.28	15	16.1	2	17.03	17	56.1	7	15.44	22	72.7	11
27.3	11.74	32	45.8	9	55.13	16	16.3	2	16.86	17	56.8	4	15.22	23	73.8	8
Oct. 7.3	11.42	32	46.7	4	54.97	17	16.5	2	16.69	18	57.2	0	14.99	24	74.6	3
17.2	11.10	31	47.1	2	54.80	16	16.7	2	16.51	17	57.2	2	14.75	23	74.9	2
27.2	10.79	30	46.9	7	54.64	14	16.9	2	16.34	16	57.0	6	14.52	22	74.7	6
Nov. 6.2	10.49	27	46.2	12	54.50	12	17.1	2	16.18	14	56.4	10	14.30	19	74.1	11
16.2	10.22	23	45.0	17	54.38	8	17.3	1	16.04	11	55.4	12	14.11	17	73.0	15
26.1	9.99	19	43.3	21	54.30	5	17.4	2	15.93	7	54.2	14	13.94	12	71.5	19
Dec. 6.1	9.80	13	41.2	25	54.25	1	17.6	1	15.86	4	52.8	17	13.82	9	69.6	23
16.1	9.67	9	38.7	29	54.24	4	17.7	2	15.82	1	51.1	19	13.73	4	67.3	25
26.1	9.58	2	35.8	31	54.28	8	17.9	1	15.83	4	49.2	20	13.69	1	64.8	28
36.0	9.56		32.7		54.36		18.0		15.87		47.2		13.70		62.0	
Sec δ, Tan δ	1.556		+1.193		1.043		−0.296		1.047		+0.311		1.255		+0.758	
Mean Place	$9^{s}.746$		25″.54		$51^{s}.289$		20″.51		$13^{s}.855$		42″.23		$12^{s}.705$		54″.78	
D′ψ α, Dω α	−0.03		−0.03		+0.01		+0.01		−0.01		−0.01		−0.02		−0.02	
Dψ δ, Dω δ	+0.2		−0.9		+0.2		−0.9		+0.2		−0.9		+0.2		−0.9	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	***f* Sagittarii.** Mag. 5.1				**γ Aquilæ.** Mag. 2.8				**δ Cygni.** Mag. 3.0				**δ Sagittæ.** Mag. 3.8		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declin tion N
	h m 19 41		° ′ −19 57		h m 19 42		° ′ +10 24		h m 19 42		° ′ +44 54		h m 19 43		° +18
	s		″		s		″		s		″		s		″
Jan. 1.0	23.62		66.9		12.27		13.8		17.43		79.8		34.91		21.5
11.0	23.72	10	66.8	1	12.34	7	12.1	17	17.45	2	76.7	31	34.97	6	19.4
21.0	23.85	13	66.7	1	12.45	11	10.4	17	17.52	7	73.6	31	35.07	10	17.4
31.0	24.02	17	66.5	2	12.59	14	8.8	16	17.65	13	70.6	30	35.21	14	15.4
Feb. 9.9	24.23	21	66.2	3	12.77	18	7.4	14	17.83	18	67.8	28	35.38	17	13.5
		23		4		20		12		23		26		21	
19.9	24.46		65.8		12.97		6.2		18.06		65.2		35.59		11.9
Mar. 1.9	24.71	25	65.4	4	13.20	23	5.2	10	18.32	26	63.1	21	35.82	23	10.7
11.9	24.99	28	64.8	6	13.45	25	4.6	6	18.62	30	61.4	17	36.07	25	9.8
21.8	25.28	29	64.1	7	13.72	27	4.4	2	18.95	33	60.3	11	36.34	27	9.4
31.8	25.59	31	63.3	8	14.01	29	4.6	2	19.31	36	59.9	4	36.63	29	9.4
		32		9		30		6		36		1		30	
Apr. 10.8	25.91		62.4		14.31		5.2		19.67		60.0		36.93		9.9
20.7	26.23	32	61.4	10	14.61	30	6.1	9	20.05	38	60.7	7	37.24	31	10.8
30.7	26.56	33	60.4	10	14.91	30	7.4	13	20.42	37	62.0	13	37.55	31	12.1
May 10.7	26.89	33	59.4	10	15.21	30	9.0	16	20.78	36	63.8	18	37.85	30	13.8
20.7	27.20	31	58.4	10	15.50	29	10.8	18	21.12	34	66.1	23	38.14	29	15.8
		30		10		28		20		31		27		28	
30.6	27.50		57.4		15.78		12.8		21.43		68.8		38.42		18.0
June 9.6	27.78	28	56.5	9	16.03	25	15.0	22	21.71	28	71.8	30	38.67	25	20.4
19.6	28.03	25	55.8	7	16.25	22	17.2	22	21.94	23	75.0	32	38.89	22	22.9
29.6	28.25	22	55.1	7	16.44	19	19.4	22	22.13	19	78.3	33	39.08	19	25.4
July 9.5	28.42	17	54.6	5	16.59	15	21.5	21	22.26	13	81.7	34	39.22	14	27.9
		13		3		10		21		7		33		11	
19.5	28.55		54.3		16.69		23.6		22.33		85.0		39.33		30.4
29.5	28.64	9	54.1	2	16.76	7	25.5	19	22.35	2	88.3	33	39.39	6	32.7
Aug. 8.4	28.68	4	54.0	1	16.78	2	27.2	17	22.31	4	91.4	31	39.40	1	34.8
18.4	28.67	1	54.1	1	16.76	2	28.7	15	22.22	9	94.2	28	39.37	3	36.6
28.4	28.62	5	54.2	1	16.69	7	30.0	13	22.08	14	96.7	25	39.30	7	38.3
		9		2		10		11		19		22		11	
Sept. 7.4	28.53		54.4		16.59		31.1		21.89		98.9		39.19		39.6
17.3	28.40	13	54.7	3	16.46	13	31.9	8	21.66	23	100.7	18	39.05	14	40.7
27.3	28.25	15	55.0	3	16.31	15	32.4	5	21.41	25	102.0	13	38.89	16	41.5
Oct. 7.3	28.09	16	55.3	3	16.15	16	32.7	3	21.14	27	102.9	9	38.71	18	41.9
17.3	27.92	17	55.5	2	15.98	17	32.7	0	20.86	28	103.3	4	38.53	18	42.0
		16		2		17		3		27		1		18	
27.2	27.76		55.7		15.81		32.4		20.59		103.2		38.35		41.8
Nov. 6.2	27.61	15	55.9	2	15.66	15	31.9	5	20.33	26	102.6	6	38.19	16	41.2
16.2	27.49	12	56.0	1	15.54	12	31.1	8	20.09	24	101.5	11	38.05	14	40.3
26.1	27.40	9	56.0	0	15.44	10	30.1	10	19.89	20	99.9	16	37.94	11	39.1
Dec. 6.1	27.35	5	56.0	0	15.37	7	28.9	12	19.72	17	97.9	20	37.86	8	37.6
		2		0		3		14		11		24		4	
16.1	27.33		56.0		15.34		27.5		19.61		95.5		37.82		36.0
26.1	27.36	3	55.9	1	15.35	1	25.9	16	19.54	7	92.8	27	37.82	0	34.1
36.0	27.44	8	55.9	0	15.40	5	24.3	16	19.53	1	89.9	29	37.85	3	32.0
Sec δ, Tan δ	1.064		−0.363		1.017		+0.184		1.412		+0.997		1.053		+0.331
Mean Place	$24^{s}.292$		$58''.56$		$13^{s}.113$		$19''.19$		$19^{s}.145$		$81''.83$		$35^{s}.865$		$26''.06$
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.01		+0.01		0.00		−0.01		−0.02		−0.03		−0.01		−0.01
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.2		−0.9		+0.2		−0.9		+0.2		−0.9		+0.2		−0.9

FOR THE UPPER TRANSIT AT WASHINGTON.

lean Solar Date.	**α Aquilæ.** (*Altair.*) Mag. 0.9				**η Aquilæ.** Var. 3.7–4.4				**δ Draconis.** Mag. 4.0				**ι Sagittarii.** Mag. 4.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 46		+ 8 38		19 48		+ 0 47		19 48		+70 2		19 49		−42 5	
	s		″		s		″		s		″		s		″	
an. 1.0	37.35		29.4		7.86		5.9		23.67		65.5		23.14		43.3	
11.0	37.42	7	27.8	16	7.94	8	4.8	11	23.54	13	62.3	32	23.25	11	41.8	15
21.0	37.53	11	26.3	15	8.05	11	3.6	12	23.53	1	58.9	34	23.40	15	40.3	15
31.0	37.67	14	24.8	15	8.20	15	2.6	10	23.64	11	55.5	34	23.60	20	38.8	15
eb. 9.9	37.85	18	23.5	13	8.37	17	1.7	9	23.87	23	52.3	32	23.84	24	37.2	16
19.9	38.05	20	22.4	11	8.57	20	1.0	7	24.20	33	49.3	30	24.11	27	35.6	16
Iar. 1.9	38.27	22	21.5	9	8.80	23	0.5	5	24.64	44	46.7	26	24.42	31	34.1	15
11.9	38.52	25	21.0	5	9.05	25	0.3	2	25.16	52	44.6	21	24.76	34	32.7	14
21.8	38.79	27	20.9	1	9.32	27	0.4	1	25.75	59	43.1	15	25.12	36	31.3	14
31.8	39.08	29	21.1	2	9.60	28	0.8	4	26.39	64	42.2	9	25.50	38	30.1	12
Apr. 10.8	39.37	29	21.7	6	9.90	30	1.5	7	27.06	67	41.9	3	25.89	39	28.9	12
20.7	39.67	30	22.6	9	10.20	30	2.4	9	27.74	68	42.3	4	26.29	40	27.9	10
30.7	39.98	31	23.9	13	10.51	31	3.7	13	28.41	67	43.4	11	26.70	41	27.1	8
May 10.7	40.29	31	25.5	16	10.81	30	5.2	15	29.05	64	45.0	16	27.10	40	26.5	6
20.7	40.58	29	27.3	18	11.10	29	6.8	16	29.64	59	47.1	21	27.49	39	26.1	4
30.6	40.85	27	29.3	20	11.38	28	8.5	17	30.16	52	49.7	26	27.87	38	25.9	2
June 9.6	41.11	26	31.4	21	11.64	26	10.3	18	30.60	44	52.7	30	28.21	34	25.9	0
19.6	41.34	23	33.5	21	11.87	23	12.1	18	30.95	35	56.0	33	28.53	32	26.2	3
29.6	41.53	19	35.7	22	12.07	20	13.8	17	31.19	24	59.5	35	28.80	27	26.7	5
July 9.5	41.69	16	37.7	20	12.24	17	15.5	17	31.33	14	63.2	37	29.02	22	27.5	8
19.5	41.80	11	39.7	20	12.36	12	17.1	16	31.36	3	66.8	36	29.19	17	28.4	9
29.5	41.87	7	41.6	19	12.44	8	18.5	14	31.28	8	70.4	36	29.30	11	29.5	11
Aug. 8.4	41.90	3	43.2	16	12.47	3	19.7	12	31.09	19	73.9	35	29.35	5	30.6	11
18.4	41.88	2	44.7	15	12.46	1	20.8	11	30.79	30	77.1	32	29.34	1	31.8	12
28.4	41.82	6	45.9	12	12.41	5	21.7	9	30.40	39	80.1	30	29.27	7	33.0	12
Sept. 7.4	41.73	9	46.9	10	12.32	9	22.3	6	29.93	47	82.7	26	29.16	11	34.2	12
17.3	41.60	13	47.7	8	12.20	12	22.8	5	29.39	54	85.0	23	29.00	16	35.2	10
27.3	41.46	14	48.2	5	12.06	14	23.1	3	28.79	60	86.7	17	28.81	19	36.0	8
Oct. 7.3	41.30	16	48.5	3	11.90	16	23.2	1	28.15	64	88.0	13	28.60	21	36.7	7
17.3	41.13	17	48.5	0	11.74	16	23.1	1	27.49	66	88.8	8	28.38	22	37.1	4
27.2	40.97	16	48.3	2	11.59	15	22.8	3	26.82	67	89.0	2	28.16	22	37.2	1
Nov. 6.2	40.83	14	47.8	5	11.45	14	22.4	4	26.17	65	88.7	3	27.96	20	37.0	2
16.2	40.70	13	47.1	7	11.33	12	21.8	6	25.55	62	87.8	9	27.79	17	36.5	5
26.1	40.60	10	46.1	10	11.23	10	21.1	7	24.99	56	86.4	14	27.66	13	35.8	7
Dec. 6.1	40.53	7	45.0	11	11.17	6	20.3	8	24.50	49	84.4	20	27.57	9	34.9	9
16.1	40.50	3	43.7	13	11.15	2	19.3	10	24.08	42	82.0	24	27.54	3	33.7	12
26.1	40.51	1	42.2	15	11.16	1	18.2	11	23.77	31	79.1	29	27.55	1	32.4	13
36.0	40.56	5	40.7	15	11.21	5	17.1	11	23.57	20	76.0	31	27.62	7	31.0	14
Sec δ, Tan δ	1.011		+0.152		1.000		+0.014		2.931		+2.755		1.348		−0.903	
Mean Place	38ˢ.170		34″.84		8ˢ.606		12″.13		28ˢ.126		65″.07		23ˢ.926		33″.21	
D′ψ α, Dω α	0.00		0.00		0.00		0.00		−0.07		−0.08		+0.02		+0.03	
Dψ δ, Dω δ	+0.2		−0.9		+0.2		−0.9		+0.2		−0.9		+0.2		[illegible]	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ε Pavonis.** Mag. 4.1				**β Aquilæ.** Mag. 3.9				**γ Sagittæ.** Mag. 3.7				**c Sagittarii.** Mag. 4.6		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	19 50		−73 7		19 51		+ 6 11		19 54		+19 15		19 57		−27 5
	s		″		s		″		s		″		s		″
Jan. 1.0	44.30		81.4		7.49		31.8		57.64		34.3		25.37		58.5
11.0	44.43	13	78.4	30	7.56	7	30.4	14	57.69	5	32.2	21	25.46	9	57.9
21.0	44.69	26	75.3	31	7.67	11	28.9	15	57.78	9	30.1	21	25.58	12	57.2
31.0	45.08	39	72.2	31	7.81	14	27.6	13	57.91	13	28.1	20	25.75	17	56.4
Feb. 9.9	45.58	50	69.3	29	7.97	16	26.4	12	58.07	16	26.2	19	25.95	20	55.6
19.9	46.19	61	66.5	28	8.17	20	25.4	10	58.26	19	24.6	16	26.18	23	54.7
Mar. 1.9	46.89	70	63.9	26	8.39	22	24.6	8	58.48	22	23.3	13	26.43	25	53.8
11.9	47.67	78	61.6	23	8.64	25	24.2	4	58.73	25	22.4	9	26.71	28	52.8
21.8	48.51	84	59.7	19	8.91	27	24.1	1	58.99	26	21.9	5	27.02	31	51.7
31.8	49.40	89	58.1	16	9.19	28	24.3	2	59.28	29	21.8	1	27.34	32	50.6
Apr. 10.8	50.32	92	56.9	12	9.48	29	24.9	6	59.58	30	22.2	4	27.67	33	49.5
20.7	51.25	93	56.1	8	9.78	30	25.9	10	59.89	31	23.1	9	28.02	35	48.4
30.7	52.19	94	55.7	4	10.09	31	27.2	13	60.20	31	24.4	13	28.37	35	47.4
May 10.7	53.11	92	55.7	0	10.39	30	28.7	15	60.51	31	26.1	17	28.71	34	46.4
20.7	53.99	88	56.2	5	10.69	30	30.4	17	60.81	30	28.1	20	29.05	34	45.5
30.6	54.82	83	57.1	9	10.97	28	32.3	19	61.09	28	30.3	22	29.38	33	44.7
June 9.6	55.57	75	58.4	13	11.22	25	34.3	20	61.35	26	32.7	24	29.69	31	44.1
19.6	56.23	66	60.0	16	11.45	23	36.3	20	61.58	23	35.2	25	29.96	27	43.6
29.6	56.79	56	61.9	19	11.65	20	38.3	20	61.78	20	37.8	26	30.20	24	43.3
July 9.5	57.23	44	64.1	22	11.81	16	40.3	20	61.93	15	40.4	26	30.41	21	43.2
19.5	57.54	31	66.5	24	11.93	12	42.1	18	62.04	11	42.9	25	30.56	15	43.3
29.5	57.71	17	69.0	25	12.01	8	43.8	17	62.11	7	45.3	24	30.67	11	43.5
Aug. 8.4	57.73	2	71.5	25	12.04	3	45.3	15	62.14	3	47.5	22	30.72	5	43.9
18.4	57.62	11	74.0	25	12.03	1	46.7	14	62.11	3	49.5	20	30.73	1	44.4
28.4	57.37	25	76.3	23	11.98	5	47.8	11	62.05	6	51.2	17	30.69	4	44.9
Sept. 7.4	57.00	37	78.4	21	11.89	9	48.7	9	61.95	10	52.7	15	30.60	9	45.5
17.3	56.52	48	80.1	17	11.77	12	49.3	6	61.81	14	53.8	11	30.48	12	46.1
27.3	55.96	56	81.5	14	11.62	15	49.8	5	61.66	15	54.7	9	30.33	15	46.7
Oct. 7.3	55.34	62	82.4	9	11.46	16	50.0	2	61.48	18	55.2	5	30.16	17	47.2
17.3	54.69	65	82.7	3	11.30	16	50.0	0	61.30	18	55.4	2	29.99	17	47.5
27.2	54.04	65	82.6	1	11.15	15	49.7	3	61.13	17	55.2	2	29.81	18	47.8
Nov. 6.2	53.43	61	81.9	7	11.00	15	49.3	4	60.96	17	54.7	5	29.65	16	47.9
16.2	52.87	56	80.7	12	10.87	13	48.6	7	60.82	14	53.9	8	29.51	14	47.8
26.1	52.40	47	79.0	17	10.77	10	47.7	9	60.70	12	52.7	12	29.41	10	47.7
Dec. 6.1	52.04	36	76.8	22	10.71	6	46.6	11	60.61	9	51.3	14	29.34	7	47.4
16.1	51.80	24	74.3	25	10.67	4	45.4	12	60.56	5	49.7	16	29.31	3	46.9
26.1	51.69	11	71.5	28	10.68	1	44.1	13	60.55	1	47.8	19	29.32	1	46.4
36.0	51.72	3	68.5	30	10.72	4	42.7	14	60.57	2	45.8	20	29.38	6	45.8
Sec δ, Tan δ	3.447		−3.299		1.006		+0.108		1.059		+0.349		1.132		−0.531
Mean Place	$46^{s}.736$		$70''.08$		$8^{s}.281$		$37''.35$		$58^{s}.596$		$38''.11$		$26^{s}.021$		$49''.34$
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.08		+0.10		0.00		0.00		−0.01		−0.01		+0.01		+0.02
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.2		−0.9		+0.2		−0.9		+0.2		−0.9		+0.2		−0.9

APPARENT PLACES OF STARS, 1915.

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	τ Aquilæ. Mag. 5.6				θ Aquilæ. Mag. 3.4				ο Cygni *seq.* Mag. 4.0				κ Cephei. Mag. 4.4			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	19 59		+ 7 2		20 6		− 1 4		20 10		+46 28		20 11		+77 26	
	s		″		s		″		s		″		s		″	
n. 1.1	58.50		10.2		54.49		33.5		55.60		59.7		39.16		84.8	
11.0	58.55	5	8.7	15	54.55	6	34.5	10	55.58	2	56.7	30	38.79	37	81.7	31
21.0	58.65	10	7.3	14	54.64	9	35.4	9	55.62	4	53.7	30	38.61	18	78.4	33
31.0	58.78	13	5.9	14	54.77	13	36.3	9	55.71	9	50.7	30	38.61	0	75.1	33
eb. 10.0	58.94	16	4.7	12	54.93	16	37.0	7	55.85	14	47.8	29	38.81	20	71.8	33
19.9	59.13	19	3.7	10	55.12	19	37.6	6	56.04	19	45.1	27	39.19	38	68.8	30
ar. 1.9	59.34	21	2.9	8	55.33	21	38.0	4	56.28	24	42.8	23	39.75	56	66.0	28
11.9	59.58	24	2.4	5	55.57	24	38.1	1	56.56	28	40.9	19	40.45	70	63.6	24
21.8	59.84	26	2.3	1	55.83	26	37.9	2	56.87	31	39.5	14	41.28	83	61.8	18
31.8	60.12	28	2.6	3	56.10	27	37.4	5	57.22	35	38.8	7	42.21	93	60.5	13
pr. 10.8	60.42	30	3.2	6	56.40	30	36.6	8	57.59	37	38.6	2	43.20	99	59.9	6
20.8	60.72	30	4.2	10	56.70	30	35.6	10	57.97	38	39.0	4	44.22	102	59.9	0
30.7	61.02	30	5.4	12	57.00	30	34.4	12	58.35	38	40.1	11	45.24	102	60.6	7
ay 10.7	61.33	31	7.0	16	57.31	31	32.9	15	58.73	38	41.7	16	46.23	99	61.8	12
20.7	61.62	29	8.7	17	57.62	31	31.3	16	59.10	37	43.7	20	47.14	91	63.6	18
30.7	61.91	29	10.7	20	57.91	29	29.6	17	59.44	34	46.2	25	47.96	82	65.9	23
une 9.6	62.17	26	12.7	20	58.18	27	27.8	18	59.75	31	49.1	29	48.66	70	68.7	28
19.6	62.41	24	14.8	21	58.43	25	26.0	18	60.02	27	52.2	31	49.22	56	71.8	31
29.6	62.61	20	16.9	21	58.64	21	24.3	17	60.24	22	55.6	34	49.64	42	75.2	34
uly 9.5	62.78	17	18.9	20	58.82	18	22.7	16	60.41	17	59.0	34	49.88	24	78.7	35
19.5	62.91	13	20.8	19	58.96	14	21.2	15	60.52	11	62.4	34	49.96	8	82.3	36
29.5	62.99	8	22.6	18	59.06	10	19.8	14	60.58	6	65.8	34	49.87	9	86.0	37
ug. 8.5	63.03	4	24.2	16	59.11	5	18.6	12	60.58	0	69.1	33	49.62	25	89.6	36
18.4	63.03	0	25.6	14	59.12	1	17.6	10	60.51	7	72.1	30	49.20	42	93.0	34
28.4	62.98	5	26.8	12	59.08	4	16.8	8	60.40	11	74.9	28	48.64	56	96.2	32
ept. 7.4	62.90	8	27.8	10	59.01	7	16.2	6	60.23	17	77.4	25	47.93	71	99.1	29
17.4	62.78	12	28.5	7	58.90	11	15.8	4	60.03	20	79.5	21	47.11	82	101.7	26
27.3	62.64	14	29.0	5	58.77	13	15.5	3	59.79	24	81.2	17	46.19	92	103.9	22
ct. 7.3	62.49	15	29.3	3	58.62	15	15.4	1	59.53	26	82.4	12	45.20	99	105.6	17
17.3	62.33	16	29.3	0	58.47	15	15.5	1	59.25	28	83.2	8	44.15	105	106.8	12
27.2	62.17	16	29.1	2	58.31	16	15.7	2	58.97	28	83.5	3	43.07	108	107.5	7
Nov. 6.2	62.02	15	28.7	4	58.17	14	16.1	4	58.70	27	83.2	3	42.00	107	107.6	1
16.2	61.89	13	28.1	6	58.04	13	16.6	5	58.45	25	82.5	7	40.96	104	107.2	4
26.2	61.79	10	27.2	9	57.94	10	17.2	6	58.22	23	81.2	13	39.98	98	106.2	10
Dec. 6.1	61.71	8	26.2	10	57.87	7	18.0	8	58.03	19	79.5	17	39.08	90	104.7	15
16.1	61.67	4	25.0	12	57.83	4	18.8	8	57.88	15	77.3	22	38.30	78	102.6	21
26.1	61.67	0	23.6	14	57.83	0	19.8	10	57.77	11	74.8	25	37.67	63	100.1	25
36.1	61.71	4	22.2	14	57.87	4	20.7	9	57.72	5	72.0	28	37.19	48	97.2	29
ec δ, Tan δ	1.008		+0.123		1.000		−0.019		1.452		+1.053		4.605		+4.495	
ean Place	59ˢ.274		15″.26		55ˢ.179		27″.58		57ˢ.352		59″.01		46ˢ.465		81″.33	
$V_\phi\alpha$, $D_\omega\alpha$	0.00		0.00		0.00		0.00		−0.02		−0.04		−0.10		−0.16	
$_\phi\delta$, $D_\omega\delta$	+0.2		−0.9		+0.2		−0.9		+0.2		−0.8		+0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	24 Vulpeculæ. Mag. 5.4				α² Capricorni. Mag. 3.8				β Capricorni. Mag. 3.2				α Pavonis. Mag. 2.1		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Dec tion S
	h m		° ′		h m		° ′		h m		° ′		h m		°
	20 13		+24 24		20 13		−12 48		20 16		−15 2		20 18		−57
	s		″		s		″		s		″		s		″
Jan. 1.1	7.85		29.0		19.78		40.0		13.66		69.6		54.85		42.6
11.0	7.88	3	26.8	22	19.84	6	40.3	3	13.72	6	69.7	1	54.91	6	40.3
21.0	7.95	7	24.5	23	19.94	10	40.5	2	13.82	10	69.8	1	55.03	12	37.9
31.0	8.05	10	22.3	22	20.07	13	40.6	1	13.95	13	69.8	0	55.22	19	35.4
Feb. 10.0	8.19	14	20.2	21	20.23	16	40.6	0	14.11	16	69.7	1	55.47	25	32.9
19.9	8.36	17	18.3	19	20.42	19	40.5	1	14.30	19	69.4	3	55.78	31	30.4
Mar. 1.9	8.57	21	16.8	15	20.64	22	40.3	2	14.52	22	69.0	4	56.14	36	28.1
11.9	8.81	24	15.6	12	20.88	24	39.8	5	14.76	24	68.5	5	56.54	40	25.8
21.8	9.07	26	14.9	7	21.14	26	39.2	6	15.02	26	67.8	7	56.98	44	23.8
31.8	9.35	28	14.6	3	21.43	29	38.4	8	15.31	29	66.9	9	57.45	47	22.0
Apr. 10.8	9.65	30	14.9	3	21.73	30	37.4	10	15.61	30	65.8	11	57.95	50	20.4
20.8	9.97	32	15.6	7	22.04	31	36.3	11	15.92	31	64.7	11	58.47	52	19.0
30.7	10.29	32	16.8	12	22.36	32	35.0	13	16.24	32	63.4	13	59.00	53	18.0
May 10.7	10.61	32	18.4	16	22.67	31	33.6	14	16.57	33	62.1	13	59.52	52	17.4
20.7	10.92	31	20.4	20	22.99	32	32.3	13	16.89	32	60.7	14	60.04	52	17.0
30.7	11.21	29	22.7	23	23.30	31	30.9	14	17.20	31	59.3	14	60.54	50	17.0
June 9.6	11.49	28	25.2	25	23.58	28	29.5	14	17.49	29	58.1	12	61.01	47	17.4
19.6	11.74	25	27.9	27	23.85	27	28.2	13	17.76	27	56.9	12	61.44	43	18.1
29.6	11.95	21	30.7	28	24.08	23	27.1	11	17.99	23	55.8	11	61.82	38	19.1
July 9.5	12.12	17	33.5	28	24.27	19	26.0	11	18.19	20	54.9	9	62.13	31	20.4
19.5	12.25	13	36.2	27	24.43	16	25.2	8	18.35	16	54.2	7	62.38	25	22.0
29.5	12.33	8	38.9	27	24.54	11	24.5	7	18.47	12	53.6	6	62.55	17	23.8
Aug. 8.5	12.37	4	41.4	25	24.60	6	23.9	6	18.54	7	53.2	4	62.65	10	25.7
18.4	12.36	1	43.7	23	24.62	2	23.6	3	18.56	2	53.0	2	62.66	1	27.6
28.4	12.30	6	45.7	20	24.60	2	23.4	2	18.53	3	52.9	1	62.60	6	29.5
Sept. 7.4	12.21	9	47.5	18	24.53	7	23.3	1	18.47	6	52.9	0	62.46	14	31.4
17.4	12.08	13	48.9	14	24.43	10	23.4	1	18.37	10	53.0	1	62.27	19	33.0
27.3	11.92	16	50.0	11	24.30	13	23.5	1	18.25	12	53.3	3	62.02	25	34.4
Oct. 7.3	11.74	18	50.7	7	24.16	14	23.7	2	18.10	15	53.5	2	61.73	29	35.5
17.3	11.56	18	51.1	4	24.00	16	23.9	2	17.94	16	53.8	3	61.42	31	36.3
27.2	11.38	18	51.1	0	23.85	15	24.2	3	17.79	15	54.1	3	61.10	32	36.6
Nov. 6.2	11.20	18	50.8	3	23.70	15	24.5	3	17.64	15	54.4	3	60.80	30	36.5
16.2	11.04	16	50.1	7	23.57	13	24.9	4	17.51	13	54.7	3	60.52	28	36.0
26.2	10.90	14	49.0	11	23.47	10	25.2	3	17.41	10	55.0	3	60.28	24	35.0
Dec. 6.1	10.79	11	47.6	14	23.40	7	25.5	3	17.33	8	55.3	3	60.10	18	33.7
16.1	10.72	7	45.8	18	23.36	4	25.8	3	17.29	4	55.5	2	59.97	13	32.0
26.1	10.68	4	43.9	19	23.36	0	26.2	4	17.29	0	55.7	2	59.91	6	30.0
36.1	10.68	0	41.7	22	23.40	4	26.5	3	17.33	4	55.8	1	59.92	1	27.8
Sec δ, Tan δ	1.098		+0.454		1.026		−0.227		1.036		−0.269		1.837		−1.54
Mean Place	8ˢ.874		31″.02		20ˢ.385		32″.60		14ˢ.253		61″.97		55ˢ.811		30″.54
D′ψ α, Dω α	−0.01		−0.02		+0.01		+0.01		+0.01		+0.01		+0.03		+0.06
D′ψ δ, Dω δ	+0.2		−0.8		+0.2		−0.8		+0.2		−0.8		+0.2		−0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	**γ Cygni.** Mag. 2.3				**π Capricorni.** Mag. 5.2				**ρ Capricorni.** Mag. 5.0				**41 Cygni.** Mag. 4.1			
	Right Ascension.		**Declination N.**		**Right Ascension.**		**Declination S.**		**Right Ascension.**		**Declination S.**		**Right Ascension.**		**Declination N.**	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	20 19		+39 58		20 22		−18 29		20 24		−18 5		20 25		+30 4	
	s		″		s		″		s		″		s		″	
n. 1.1	9.20	1	63.1	27	26.88	5	35.7	1	0.28	5	51.5	0	54.27	1	63.3	23
11.0	9.19	3	60.4	28	26.93	9	35.6	1	0.33	9	51.5	1	54.28	4	61.0	25
21.0	9.22	9	57.6	28	27.02	13	35.5	3	0.42	13	51.4	3	54.32	9	58.5	24
31.0	9.31	13	54.8	27	27.15	16	35.2	4	0.55	16	51.1	3	54.41	12	56.1	24
b. 10.0	9.44	17	52.1	25	27.31	19	34.8	4	0.71	18	50.8	5	54.53	17	53.7	21
19.9	9.61	22	49.6	22	27.50	21	34.4	6	0.89	22	50.3	6	54.70	20	51.6	18
ar. 1.9	9.83	25	47.4	17	27.71	25	33.8	8	1.11	24	49.7	7	54.90	23	49.8	14
11.9	10.08	29	45.7	12	27.96	26	33.0	8	1.35	26	49.0	9	55.13	26	48.4	10
21.9	10.37	31	44.5	7	28.22	29	32.2	11	1.61	28	48.1	10	55.39	28	47.4	5
31.8	10.68	34	43.8	1	28.51	30	31.1	11	1.89	31	47.1	11	55.67	31	46.9	1
pr. 10.8	11.02	35	43.7	4	28.81	32	30.0	12	2.20	31	46.0	12	55.98	32	47.0	6
20.8	11.37	36	44.1	10	29.13	32	28.8	13	2.51	33	44.8	13	56.30	33	47.6	11
30.7	11.73	36	45.1	16	29.45	33	27.5	14	2.84	33	43.5	14	56.63	33	48.7	15
ay 10.7	12.09	34	46.7	20	29.78	33	26.1	13	3.17	32	42.1	13	56.96	33	50.2	20
20.7	12.43	33	48.7	24	30.11	32	24.8	12	3.49	32	40.8	13	57.29	31	52.2	23
30.7	12.76	30	51.1	28	30.43	30	23.6	12	3.81	30	39.5	12	57.60	29	54.5	26
une 9.6	13.06	27	53.9	30	30.73	27	22.4	11	4.11	28	38.3	11	57.89	26	57.1	28
19.6	13.33	22	56.9	32	31.00	25	21.3	9	4.39	24	37.2	10	58.15	22	59.9	29
29.6	13.55	18	60.1	33	31.25	21	20.4	7	4.63	21	36.2	7	58.37	19	62.8	30
uly 9.6	13.73	13	63.4	33	31.46	17	19.7	6	4.84	17	35.5	6	58.56	14	65.8	30
19.5	13.86	7	66.7	32	31.63	12	19.1	4	5.01	13	34.9	4	58.70	9	68.8	29
29.5	13.93	2	69.9	31	31.75	8	18.7	2	5.14	7	34.5	3	58.79	4	71.7	28
ug. 8.5	13.95	3	73.0	29	31.83	3	18.5	0	5.21	4	34.2	1	58.83	0	74.5	26
18.4	13.92	8	75.9	27	31.86	2	18.5	1	5.25	2	34.1	1	58.83	6	77.1	23
28.4	13.84	13	78.6	23	31.84	6	18.6	2	5.23	6	34.2	2	58.77	9	79.4	21
ept. 7.4	13.71	17	80.9	20	31.78	10	18.8	3	5.17	10	34.4	3	58.68	13	81.5	17
17.4	13.54	20	82.9	16	31.68	12	19.1	3	5.07	12	34.7	3	58.55	16	83.2	14
27.3	13.34	22	84.5	12	31.56	15	19.4	4	4.95	14	35.0	4	58.39	18	84.6	10
ct. 7.3	13.12	23	85.7	8	31.41	15	19.8	4	4.81	16	35.4	4	58.21	20	85.6	6
17.3	12.89	24	86.5	2	31.26	16	20.2	3	4.65	16	35.8	3	58.01	20	86.2	2
27.3	12.65	24	86.7	2	31.10	15	20.5	3	4.49	15	36.1	3	57.81	19	86.4	3
ov. 6.2	12.41	21	86.5	7	30.95	14	20.8	2	4.34	13	36.4	3	57.62	18	86.1	6
16.2	12.20	20	85.8	11	30.81	10	21.0	2	4.21	11	36.7	2	57.44	15	85.5	10
26.2	12.00	16	84.7	16	30.71	8	21.2	2	4.10	8	36.9	2	57.29	13	84.5	14
ec. 6.1	11.84	13	83.1	20	30.63	5	21.4	1	4.02	5	37.1	1	57.16	10	83.1	18
16.1	11.71	8	81.1	23	30.58	1	21.5	0	3.97	1	37.2	0	57.06	6	81.3	20
26.1	11.63	4	78.8	26	30.57	3	21.5	1	3.96	3	37.2	0	57.00	2	79.3	23
36.1	11.59		76.2		30.60		21.4		3.99		37.2		56.98		77.0	
c δ, Tan δ	1.305		+0.839		1.054		−0.334		1.052		−0.327		1.156		+0.579	
ean Place	$10^s.642$		62″.59		$27^s.442$		27″.63		$0^s.841$		43″.55		$55^s.395$		63″.65	
$'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.02		−0.03		+0.01		+0.01		+0.01		+0.01		−0.01		−0.02	
$_{\psi}\delta$, $D_{\omega}\delta$	+0.2		−0.8		+0.2		−0.8		+0.2		−0.8		+0.2		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Cephei. Mag. 4.3				ε Delphini. Mag. 4.0				Groombridge 3241. Mag. 6.4				α Indi. Mag. 3.2		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declina- tion S.
	h m 20 28		° ′ +62 42		h m 20 29		° ′ +11 0		h m 20 30		° ′ +72 14		h m 20 31		° −47 3
	s		″		s		″		s		″		s		″
Jan. 1.1	6.48		33.2		8.38		45.9		18.09		42.7		34.83		31.7
11.0	6.34	14	30.2	30	8.41	3	44.4	15	17.82	27	39.7	30	34.87	4	29.9
21.0	6.29	5	27.0	32	8.47	6	42.8	16	17.66	16	36.5	32	34.97	10	27.9
31.0	6.32	3	23.7	33	8.57	10	41.3	15	17.64	2	33.2	33	35.12	15	25.9
Feb. 10.0	6.44	12	20.5	32	8.70	13	39.9	14	17.76	12	29.9	33	35.31	19	23.8
19.9	6.64	20	17.4	31	8.86	16	38.7	12	18.00	24	26.7	32	35.55	24	21.7
Mar. 1.9	6.92	28	14.7	27	9.05	19	37.8	9	18.37	37	23.9	28	35.83	28	19.6
11.9	7.27	35	12.3	24	9.27	22	37.2	6	18.86	49	21.4	25	36.15	32	17.6
21.9	7.68	41	10.5	18	9.52	25	36.9	3	19.44	58	19.4	20	36.50	35	15.6
31.8	8.14	46	9.2	13	9.78	26	37.0	1	20.09	65	18.0	14	36.88	38	13.8
Apr. 10.8	8.64	50	8.6	6	10.06	28	37.5	5	20.80	71	17.2	8	37.28	40	12.1
20.8	9.17	53	8.6	0	10.36	30	38.4	9	21.55	75	17.1	1	37.71	43	10.6
30.7	9.70	53	9.3	7	10.67	31	39.6	12	22.31	76	17.5	4	38.14	43	9.4
May 10.7	10.23	53	10.5	12	10.98	31	41.2	16	23.05	74	18.6	11	38.58	44	8.4
20.7	10.73	50	12.3	18	11.28	30	43.0	18	23.75	70	20.3	17	39.02	44	7.6
30.7	11.20	47	14.7	24	11.58	30	45.0	20	24.40	65	22.5	22	39.44	42	7.2
June 9.6	11.63	43	17.5	28	11.86	28	47.2	22	24.98	58	25.2	27	39.85	41	7.1
19.6	11.99	36	20.6	31	12.12	26	49.5	23	25.47	49	28.2	30	40.22	37	7.3
29.6	12.28	29	24.0	34	12.35	23	51.7	22	25.85	38	31.6	34	40.55	33	7.7
July 9.6	12.50	22	27.5	35	12.54	19	54.0	23	26.12	27	35.1	35	40.84	29	8.5
19.5	12.64	14	31.2	37	12.69	15	56.2	22	26.27	15	38.8	37	41.07	23	9.5
29.5	12.70	6	34.9	37	12.80	11	58.3	21	26.30	3	42.5	37	41.24	17	10.8
Aug. 8.5	12.67	3	38.5	36	12.86	6	60.2	19	26.21	9	46.2	37	41.34	10	12.2
18.4	12.56	11	42.0	35	12.88	2	61.9	17	26.00	21	49.7	35	41.38	4	13.7
28.4	12.37	19	45.2	32	12.86	2	63.4	15	25.68	32	53.0	33	41.36	2	15.3
Sept. 7.4	12.11	26	48.2	30	12.79	7	64.6	12	25.26	42	56.1	31	41.27	9	16.8
17.4	11.78	33	50.8	26	12.69	10	65.6	10	24.74	52	58.9	28	41.13	14	18.3
27.3	11.41	37	53.0	22	12.57	12	66.3	7	24.14	60	61.3	24	40.95	18	19.6
Oct. 7.3	11.00	41	54.7	17	12.42	15	66.8	5	23.49	65	63.2	19	40.74	21	20.7
17.3	10.55	45	56.0	13	12.27	15	67.0	2	22.79	70	64.7	15	40.50	24	21.5
27.3	10.10	45	56.7	7	12.11	16	66.9	1	22.07	72	65.6	9	40.26	24	21.9
Nov. 6.2	9.65	45	56.9	2	11.96	15	66.6	3	21.34	73	65.9	3	40.03	23	22.1
16.2	9.21	44	56.5	4	11.82	14	66.0	6	20.62	72	65.7	2	39.81	22	21.9
26.2	8.79	42	55.6	9	11.70	12	65.2	8	19.94	68	64.9	8	39.63	18	21.3
Dec. 6.1	8.42	37	54.1	15	11.61	9	64.2	10	19.32	62	63.5	14	39.48	15	20.4
16.1	8.11	31	52.1	20	11.54	7	63.0	12	18.77	55	61.6	19	39.38	10	19.2
26.1	7.85	26	49.6	25	11.51	3	61.6	14	18.32	45	59.2	24	39.34	4	17.7
36.1	7.67	18	46.8	28	11.52	1	60.1	15	17.97	35	56.5	27	39.35	1	16.0
Sec δ, Tan δ	2.181		+1.938		1.019		+0.194		3.279		+3.123		1.484		−1.095
Mean Place	9s.493		29″.13		9s.144		49″.16		23s.002		37″.57		35s.501		19″.98
D′ψ α, Dω α	−0.04		−0.08		0.00		−0.01		−0.07		−0.13		+0.02		+0.04
Dψ δ, Dω δ	+0.2		−0.8		+0.2		−0.8		+0.2		−0.8		+0.2		−0.8

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**β Delphini.** Mag. 3.7				**υ Capricorni.** Mag. 5.3				**α Delphini.** Mag. 3.9				**β Pavonis.** Mag. 3.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	20 33		+14 17		20 35		−18 26		20 35		+15 36		20 37		−66 30	
	s		″		s		″		s		″		s		″	
Jan. 1.1	33.03	2	53.2	17	12.24	5	26.5	1	40.61	1	40.3	18	17.54	0	48.6	28
11.1	33.05	6	51.5	17	12.29	8	26.4	1	40.62	5	38.5	17	17.54	9	45.8	29
21.0	33.11	9	49.8	17	12.37	11	26.3	3	40.67	9	36.8	18	17.63	18	42.9	29
31.0	33.20	12	48.1	16	12.48	15	26.0	4	40.76	12	35.0	16	17.81	27	40.0	30
Feb. 10.0	33.32	16	46.5	13	12.63	17	25.6	5	40.88	16	33.4	14	18.08	35	37.0	30
19.9	33.48	19	45.2	11	12.80	20	25.1	7	41.04	18	32.0	12	18.43	42	34.0	29
Mar. 1.9	33.67	21	44.1	8	13.00	23	24.4	8	41.22	21	30.8	8	18.85	49	31.1	27
11.9	33.88	24	43.3	4	13.23	26	23.6	9	41.43	24	30.0	5	19.34	55	28.4	24
21.9	34.12	27	42.9	0	13.49	28	22.7	11	41.67	27	29.5	0	19.89	60	26.0	22
31.8	34.39	28	42.9	4	13.77	30	21.6	12	41.94	28	29.5	3	20.49	63	23.8	19
Apr. 10.8	34.67	30	43.3	8	14.07	31	20.4	13	42.22	30	29.8	8	21.12	67	21.9	15
20.8	34.97	31	44.1	12	14.38	32	19.1	14	42.52	31	30.6	12	21.79	68	20.4	12
30.8	35.28	31	45.3	15	14.70	33	17.7	14	42.83	31	31.8	15	22.47	69	19.2	8
May 10.7	35.59	31	46.8	19	15.03	33	16.3	14	43.14	32	33.3	19	23.16	69	18.4	4
20.7	35.90	30	48.7	21	15.36	32	14.9	13	43.46	30	35.2	21	23.85	66	18.0	1
30.7	36.20	28	50.8	22	15.68	31	13.6	13	43.76	28	37.3	23	24.51	62	18.1	5
June 9.6	36.48	26	53.0	24	15.99	29	12.3	11	44.04	26	39.6	24	25.13	57	18.6	9
19.6	36.74	23	55.4	24	16.28	25	11.2	10	44.30	23	42.0	25	25.70	51	19.5	12
29.6	36.97	20	57.8	24	16.53	22	10.2	8	44.53	20	44.5	24	26.21	44	20.7	16
July 9.6	37.17	15	60.2	24	16.75	18	9.4	6	44.73	16	46.9	25	26.65	34	22.3	19
19.5	37.32	11	62.6	22	16.93	14	8.8	5	44.89	11	49.4	23	26.99	24	24.2	21
29.5	37.43	7	64.8	21	17.07	8	8.3	2	45.00	6	51.7	21	27.23	14	26.3	23
Aug. 8.5	37.50	2	66.9	19	17.15	4	8.1	1	45.06	2	53.8	20	27.37	4	28.6	23
18.5	37.52	2	68.8	17	17.19	0	8.0	1	45.08	2	55.8	17	27.41	7	30.9	24
28.4	37.50	7	70.5	14	17.19	5	8.1	2	45.06	6	57.5	15	27.34	17	33.3	22
Sept. 7.4	37.43	9	71.9	11	17.14	9	8.3	3	45.00	10	59.0	12	27.17	26	35.5	20
17.4	37.34	13	73.0	9	17.05	11	8.6	4	44.90	12	60.2	9	26.91	33	37.5	18
27.3	37.21	15	73.9	6	16.94	14	9.0	4	44.78	15	61.1	7	26.58	40	39.3	14
Oct. 7.3	37.06	16	74.5	3	16.80	16	9.4	5	44.63	16	61.8	3	26.18	43	40.7	9
17.3	36.90	16	74.8	0	16.64	15	9.9	4	44.47	16	62.1	0	25.75	46	41.6	5
27.3	36.74	15	74.8	3	16.49	15	10.3	3	44.31	16	62.1	2	25.29	45	42.1	0
Nov. 6.2	36.59	15	74.5	6	16.34	14	10.6	3	44.15	15	61.9	6	24.84	42	42.1	5
16.2	36.44	12	73.9	8	16.20	11	10.9	2	44.00	12	61.3	8	24.42	38	41.6	11
26.2	36.32	10	73.1	11	16.09	9	11.1	2	43.88	10	60.5	11	24.04	32	40.5	15
Dec. 6.2	36.22	7	72.0	13	16.00	5	11.3	1	43.78	8	59.4	14	23.72	24	39.0	19
16.1	36.15	3	70.7	15	15.95	2	11.4	0	43.70	4	58.0	15	23.48	16	37.1	23
26.1	36.12	1	69.2	16	15.93	1	11.4	1	43.66	0	56.5	17	23.32	6	34.8	25
36.1	36.11		67.6		15.94		11.3		43.66		54.8		23.26		32.3	
Sec δ, Tan δ	1.032		+0.255		1.054		−0.333		1.038		+0.279		2.509		−2.301	
Mean Place	$33^s.826$		55″.61		$12^s.769$		18″.57		$41^s.414$		42″.38		$18^s.797$		35″.31	
$D_\psi \alpha$, $D_\omega \alpha$	−0.01		−0.01		+0.01		+0.01		−0.01		−0.01		+0.05		+0.10	
$D_\psi \delta$, $D_\omega \delta$	+0.2		−0.8		+0.2		−0.8		+0.2		−0.8		+0.3		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Cygni. (*Deneb.*) Mag. 1.3				δ Delphini. Mag. 4.5				ψ Capricorni. Mag. 4.3				γ Delphini *seq.* Mag. 4.5			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N	
	h m 20 38		° ′ +44 58		h m 20 39		° ′ +14 45		h m 20 41		° ′ −25 34		h m 20 42		° ′ +15 48	
	s		″		s		″		s		″		s		″	
Jan. 1.1	30.43	5	36.7	27	28.66	1	65.9	17	3.44	4	45.9	6	42.09	1	60.8	18
11.1	30.38	0	34.0	29	28.67	5	64.2	17	3.48	8	45.3	6	42.10	5	59.0	17
21.0	30.38	6	31.1	29	28.72	9	62.5	17	3.56	11	44.7	7	42.15	8	57.3	18
31.0	30.44	10	28.2	29	28.81	11	60.8	15	3.67	15	44.0	9	42.23	11	55.5	16
Feb. 10.0	30.54	16	25.3	26	28.92	15	59.3	14	3.82	17	43.1	9	42.34	15	53.9	14
19.9	30.70	20	22.7	24	29.07	18	57.9	11	3.99	21	42.2	11	42.49	17	52.5	12
Mar. 1.9	30.90	24	20.3	20	29.25	21	56.8	8	4.20	24	41.1	12	42.66	21	51.3	9
11.9	31.14	29	18.3	15	29.46	24	56.0	5	4.44	26	39.9	12	42.87	24	50.4	5
21.9	31.43	32	16.8	9	29.70	26	55.5	0	4.70	29	38.7	14	43.11	26	49.9	0
31.8	31.75	35	15.9	4	29.96	28	55.5	4	4.99	31	37.3	14	43.37	28	49.9	3
Apr. 10.8	32.10	37	15.5	2	30.24	30	55.9	8	5.30	32	35.9	14	43.65	29	50.2	8
20.8	32.47	38	15.7	8	30.54	31	56.7	11	5.62	34	34.5	14	43.94	31	51.0	11
30.8	32.85	38	16.5	13	30.85	31	57.8	16	5.96	35	33.1	14	44.25	32	52.1	15
May 10.7	33.23	37	17.8	19	31.16	31	59.4	18	6.31	34	31.7	13	44.57	31	53.6	18
20.7	33.60	36	19.7	23	31.47	30	61.2	21	6.65	34	30.4	12	44.88	30	55.4	21
30.7	33.96	33	22.0	27	31.77	29	63.3	23	6.99	32	29.2	10	45.18	29	57.5	23
June 9.6	34.29	30	24.7	30	32.06	27	65.6	23	7.31	30	28.2	8	45.47	27	59.8	24
19.6	34.59	25	27.7	32	32.33	23	67.9	25	7.61	27	27.4	7	45.74	24	62.2	25
29.6	34.84	21	30.9	34	32.56	20	70.4	24	7.88	24	26.7	4	45.98	20	64.7	25
July 9.6	35.05	15	34.3	34	32.76	16	72.8	24	8.12	19	26.3	2	46.18	16	67.2	24
19.5	35.20	9	37.7	34	32.92	12	75.2	23	8.31	15	26.1	0	46.34	12	69.6	23
29.5	35.29	4	41.1	33	33.04	7	77.5	21	8.46	10	26.1	1	46.46	7	71.9	22
Aug. 8.5	35.33	2	44.4	32	33.11	2	79.6	19	8.56	5	26.2	3	46.53	3	74.1	20
18.5	35.31	7	47.6	29	33.13	1	81.5	17	8.61	0	26.5	5	46.56	2	76.1	18
28.4	35.24	12	50.5	27	33.12	6	83.2	15	8.61	5	27.0	6	46.54	5	77.9	15
Sept. 7.4	35.12	17	53.2	23	33.06	10	84.7	12	8.56	9	27.6	7	46.49	9	79.4	12
17.4	34.95	21	55.5	19	32.96	12	85.9	9	8.47	12	28.3	6	46.40	13	80.6	10
27.3	34.74	23	57.4	15	32.84	14	86.8	6	8.35	14	28.9	7	46.27	14	81.6	6
Oct. 7.3	34.51	25	58.9	11	32.70	16	87.4	3	8.21	16	29.6	6	46.13	16	82.2	4
17.3	34.26	26	60.0	5	32.54	16	87.7	1	8.05	17	30.2	4	45.97	16	82.6	1
27.3	34.00	25	60.5	1	32.38	16	87.8	3	7.88	16	30.6	4	45.81	16	82.7	2
Nov. 6.2	33.75	25	60.6	4	32.22	14	87.5	5	7.72	14	31.0	2	45.65	14	82.5	5
16.2	33.50	23	60.2	10	32.08	13	87.0	8	7.58	13	31.2	1	45.51	13	82.0	9
26.2	33.27	20	59.2	14	31.95	10	86.2	11	7.45	10	31.3	1	45.38	11	81.1	10
Dec. 6.2	33.07	16	57.8	19	31.85	8	85.1	13	7.35	6	31.2	2	45.27	7	80.1	13
16.1	32.91	12	55.9	22	31.77	4	83.8	15	7.29	3	31.0	3	45.20	5	78.8	15
26.1	32.79	8	53.7	26	31.73	0	82.3	16	7.26	2	30.7	4	45.15	1	77.3	17
36.1	32.71		51.1		31.73		80.7		7.28		30.3		45.14		75.6	
Sec δ, Tan δ	1.414		+0.999		1.034		+0.264		1.109		−0.479		1.039		+0.283	
Mean Place	32ˢ.029		33″.82		29ˢ.443		67″.98		3ˢ.938		36″.81		42ˢ.881		62″.44	
$D'_\psi\alpha$, $D_\omega\alpha$	−0.02		−0.04		−0.01		−0.01		+0.01		+0.02		−0.01		−0.01	
δ, $D_\omega\delta$	+0.3		−0.8		+0.3		−0.8		+0.3		−0.8		+0.3		−0.8	

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**ε Cygni.** Mag. 2.6				**ε Aquarii.** Mag. 3.8				**η Cephei.** Mag. 3.6				**μ Aquarii.** Mag. 4.8			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	20 42		+33 38		20 43		− 9 48		20 43		+61 30		20 48		− 9 17	
	s		″		s		″		s		″		s		″	
an. 1.1	45.14		66.2		4.02		33.7		30.98		35.6		3.71		77.2	
11.1	45.12	2	63.8	24	4.06	4	34.1	4	30.83	15	32.8	28	3.74	3	77.6	4
21.0	45.15	3	61.3	25	4.12	6	34.4	3	30.75	8	29.7	31	3.80	6	77.9	3
31.0	45.21	6	58.7	26	4.22	10	34.7	3	30.76	1	26.5	32	3.89	9	78.2	3
eb. 10.0	45.31	10	56.3	24	4.35	13	34.8	1	30.85	9	23.3	32	4.02	13	78.3	1
19.9	45.46	15	54.0	23	4.51	16	34.8	0	31.01	16	20.2	31	4.17	15	78.3	0
ar. 1.9	45.65	19	52.0	20	4.70	19	34.6	2	31.26	25	17.4	28	4.35	18	78.1	2
11.9	45.87	22	50.5	15	4.91	21	34.2	4	31.57	31	15.0	24	4.56	21	77.7	4
21.9	46.12	25	49.3	12	5.15	24	33.5	7	31.95	38	13.1	19	4.80	24	77.1	6
31.8	46.41	29	48.7	6	5.41	26	32.7	8	32.39	44	11.8	13	5.06	26	76.3	8
pr. 10.8	46.72	31	48.5	2	5.70	29	31.7	10	32.86	47	11.0	8	5.34	28	75.2	11
20.8	47.04	32	48.9	4	6.00	30	30.4	13	33.36	50	10.9	1	5.64	30	74.0	12
30.8	47.38	34	49.9	10	6.31	31	29.1	13	33.88	52	11.4	5	5.95	31	72.6	14
ay 10.7	47.73	35	51.3	14	6.62	31	27.6	15	34.40	52	12.5	11	6.27	32	71.1	15
20.7	48.06	33	53.2	19	6.94	32	26.0	16	34.90	50	14.2	17	6.59	32	69.5	16
30.7	48.39	33	55.4	22	7.25	31	24.4	16	35.37	47	16.4	22	6.90	31	67.9	16
une 9.6	48.70	31	58.0	26	7.55	30	22.8	16	35.81	44	19.1	27	7.20	30	66.3	16
19.6	48.98	28	60.9	29	7.83	28	21.3	15	36.19	38	22.2	31	7.48	28	64.7	16
29.6	49.22	24	63.9	30	8.08	25	19.8	15	36.50	31	25.5	33	7.73	25	63.2	15
uly 9.6	49.42	20	67.0	31	8.30	22	18.5	13	36.75	25	29.0	35	7.95	22	61.9	13
19.5	49.58	16	70.1	31	8.48	18	17.4	11	36.92	17	32.7	37	8.13	18	60.7	12
29.5	49.69	11	73.2	31	8.61	13	16.5	9	37.01	9	36.4	37	8.27	14	59.7	10
ug. 8.5	49.75	6	76.2	30	8.71	10	15.7	8	37.02	1	40.1	37	8.37	10	58.9	8
18.5	49.76	1	79.0	28	8.75	4	15.1	6	36.95	7	43.7	36	8.42	5	58.3	6
28.4	49.72	4	81.5	25	8.75	0	14.7	4	36.80	15	47.0	33	8.42	0	57.9	4
ept. 7.4	49.64	8	83.8	23	8.71	4	14.5	2	36.58	22	50.1	31	8.38	4	57.6	3
17.4	49.51	13	85.8	20	8.63	8	14.4	1	36.30	28	52.9	28	8.31	7	57.5	1
27.3	49.36	15	87.4	16	8.52	11	14.5	1	35.97	33	55.3	24	8.21	10	57.6	1
ct. 7.3	49.18	18	88.7	13	8.39	13	14.7	2	35.59	38	57.2	19	8.08	13	57.7	1
17.3	48.98	20	89.5	8	8.25	14	14.9	2	35.19	40	58.7	15	7.94	14	57.9	2
27.3	48.78	20	89.9	4	8.10	15	15.2	3	34.77	42	59.7	10	7.79	15	58.3	4
Nov. 6.2	48.58	20	89.9	0	7.95	15	15.6	4	34.34	43	60.1	4	7.64	15	58.7	4
16.2	48.38	20	89.4	5	7.82	13	16.0	4	33.92	42	59.9	2	7.51	13	59.1	4
26.2	48.21	17	88.5	9	7.71	11	16.4	4	33.53	39	59.2	7	7.40	11	59.5	4
Dec. 6.2	48.07	14	87.2	13	7.62	9	16.9	5	33.17	36	57.9	13	7.31	9	60.0	5
16.1	47.95	12	85.6	16	7.56	6	17.3	4	32.85	32	56.1	18	7.25	6	60.4	4
26.1	47.87	8	83.6	20	7.54	2	17.8	5	32.59	26	53.8	23	7.22	3	60.9	5
36.1	47.82	5	81.3	23	7.55	1	18.2	4	32.40	19	51.2	26	7.22	0	61.3	4
ec δ, Tan δ	1.202		+0.666		1.015		−0.173		2.096		+1.842		1.013		−0.164	
lean Place	46ˢ.314		64″.68		4ˢ.555		27″.29		33ˢ.778		30″.14		4ˢ.231		70″.94	
$_\psi\alpha$, $D_\omega\alpha$	−0.01		−0.03		0.00		+0.01		−0.04		−0.08		0.00		+0.01	
$_\psi\delta$, $D_\omega\delta$	+0.3		−0.8		+0.3		−0.8		+0.3		−0.8		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**β Indi.** Mag. 3.7				**32 Vulpeculæ.** Mag. 5.2				**220 Draconis** (Heis). Mag. 5.6				**ν Cygni.** Mag. 4.0		
	Right Ascension		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.
	h m 20 48		° ′ −58 46		h m 20 50		° ′ +27 43		h m 20 51		° ′ +80 13		h m 20 53		° +40 5
	s		″		s		″		s		″		s		″
Jan. 1.1	9.75		45.0		55.23		62.7		19.87		71.1		58.84		25.2
11.1	9.74	1	42.6	24	55.22	1	60.6	21	19.18	69	68.4	27	58.79	5	22.6
21.0	9.81	7	40.1	25	55.24	2	58.3	23	18.70	48	65.3	31	58.79	0	19.9
31.0	9.95	14	37.5	26	55.30	6	56.0	23	18 47	23	62.1	32	58.83	4	17.2
Feb. 10.0	10.15	20	34.7	28	55.40	10	53.8	22	18.48	1	58.9	32	58.92	9	14.5
20.0	10.41	26	32.0	27	55.54	14	51.8	20	18.74	26	55.7	32	59.05	13	11.9
Mar. 1.9	10.73	32	29.4	26	55.71	17	50.1	17	19.23	49	52.7	30	59.23	18	9.6
11.9	11.10	37	26.8	26	55.92	21	48.7	14	19.94	71	50.0	27	59.45	22	7.7
21.9	11.52	42	24.4	24	56.15	23	47.7	10	20.85	91	47.7	23	59.71	26	6.3
31.8	11.98	46	22.1	23	56.42	27	47.2	5	21.91	106	46.0	17	60.00	29	5.3
Apr. 10.8	12.47	49	20.1	20	56.71	29	47.2	0	23.09	118	44.8	12	60.33	33	4.9
20.8	12.99	52	18.4	17	57.02	31	47.6	4	24.35	126	44.3	5	60.67	34	5.1
30.8	13 52	53	17.0	14	57.35	33	48.6	10	25.64	129	44.4	1	61.03	36	5.8
May 10.7	14.07	55	16.0	10	57.68	33	50.0	14	26.93	129	45.1	7	61.40	37	7.1
20.7	14.62	55	15.3	7	58.00	32	51.8	18	28.16	123	46.4	13	61.76	36	8.8
30.7	15.15	53	15.0	3	58.32	32	54.0	22	29.30	114	48.2	18	62.11	35	11.0
June 9.7	15.66	51	15.1	1	58.63	31	56.5	25	30.33	103	50.6	24	62.45	34	13.6
19.6	16.13	47	15.5	4	58.91	28	59.2	27	31.20	87	53.3	27	62.75	30	16.5
29.6	16.56	43	16.4	9	59.15	24	62.1	29	31.90	70	56.5	32	63.01	26	19.6
July 9.6	16.93	37	17.6	12	59.36	21	65.0	29	32.40	50	59.9	34	63.23	22	22.9
19.5	17.23	30	19.0	14	59.53	17	67.9	29	32.71	31	63.4	35	63.40	17	26.2
29.5	17.45	22	20.8	18	59.65	12	70.8	29	32.80	9	67.1	37	63.52	12	29.5
Aug. 8.5	17.60	15	22.7	19	59.72	7	73.5	27	32.68	12	70.8	37	63.59	7	32.7
18.5	17.66	6	24.7	20	59.75	3	76.1	26	32.35	33	74.4	36	63.60	1	35.8
28.4	17.64	2	26.8	21	59.73	2	78.4	23	31.82	53	78.0	36	63.56	4	38.7
Sept. 7.4	17.54	10	28.9	21	59.66	7	80.5	21	31.11	71	81.3	33	63.46	10	41.3
17.4	17.37	17	30.8	19	59.56	10	82.3	18	30.23	88	84.3	30	63.33	13	43.6
27.4	17.13	24	32.5	17	59.42	14	83.8	15	29.20	103	87.0	27	63.16	17	45.6
Oct. 7.3	16.85	28	33.9	14	59.26	16	84.9	11	28.05	115	89.3	23	62.96	20	47.1
17.3	16.54	31	34.9	10	59.09	17	85.6	7	26.79	126	91.2	19	62.74	22	48.2
27.3	16.21	33	35.6	7	58.91	18	86.0	4	25.47	132	92.5	13	62.51	23	48.8
Nov. 6.2	15.88	33	35.8	2	58.72	19	85.9	1	24.12	135	93.3	8	62.28	23	49.0
16.2	15.56	32	35.5	3	58.55	17	85.5	4	22.76	136	93.6	3	62.06	22	48.7
26.2	15.28	28	34.8	7	58.39	16	84.7	8	21.44	132	93.2	4	61.86	20	47.9
Dec. 6.2	15.05	23	33.7	11	58.26	13	83.5	12	20.19	125	92.3	9	61.67	19	46.7
16.1	14.87	18	32.2	15	58.16	10	82.0	15	19.06	113	90.8	15	61.52	15	45.1
26.1	14.76	11	30.3	19	58.09	7	80.2	18	18.06	100	88.8	20	61.41	11	43.0
36.1	14.71	5	28.1	22	58.05	4	78.2	20	17.25	81	86.3	25	61.33	8	40.6
Sec δ, Tan δ	1.929		−1.650		1.130		+0.526		5.896		+5.811		1.322		+0.864
Mean Place	10ˢ.556		31″.82		56ˢ.225		61″.69		28ˢ.984		63″.12		60ˢ.218		21″.60
$D'_\psi \alpha$, $D_\omega \alpha$	+0.03		+0.07		−0.01		−0.02		−0.11		−0.26		−0.02		−0.04
$D'_\psi \delta$, $D_\omega \delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	α Octantis. Mag. 5.2				γ Microscopii. Mag. 4.7				θ Capricorni. Mag. 4.2				ξ Cygni. Mag. 3.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	20 54		−77 20		20 56		−32 35		21 1		−17 34		21 1		+43 35	
	s		″		s		″		s		″		s		″	
Jan. 1.1	25.36	17	72.6	31	4.45	2	36.6	9	9.82	2	24.5	1	48.86	7	22.7	25
11.1	25.19	1	69.5	33	4.47	6	35.7	11	9.84	5	24.4	2	48.79	2	20.2	27
21.0	25.20	17	66.2	34	4.53	10	34.6	12	9.89	8	24.2	3	48.77	2	17.5	28
31.0	25.37	34	62.8	34	4.63	13	33.4	13	9.97	12	23.9	4	48.79	8	14.7	28
Feb. 10.0	25.71	50	59.4	34	4.76	17	32.1	14	10.09	15	23.5	5	48.87	12	11.9	26
20.0	26.21	64	56.0	33	4.93	21	30.7	16	10.24	17	23.0	7	48.99	17	9.3	24
Mar. 1.9	26.85	77	52.7	31	5.14	23	29.1	16	10.41	21	22.3	9	49.16	22	6.9	21
11.9	27.62	88	49.6	28	5.37	27	27.5	16	10.62	23	21.4	10	49.38	26	4.8	16
21.9	28.50	98	46.8	25	5.64	30	25.9	17	10.85	26	20.4	12	49.64	30	3.2	11
31.8	29.48	106	44.3	21	5.94	31	24.2	16	11.11	29	19.2	13	49.94	33	2.1	5
Apr. 10.8	30.54	112	42.2	18	6.25	34	22.6	16	11.40	30	17.9	14	50.27	36	1.6	0
20.8	31.66	116	40.4	13	6.59	36	21.0	16	11.70	32	16.5	16	50.63	37	1.6	6
30.8	32.82	117	39.1	8	6.95	36	19.4	14	12.02	32	14.9	15	51.00	37	2.2	12
May 10.7	33.99	117	38.3	4	7.31	37	18.0	13	12.34	33	13.4	16	51.37	38	3.4	17
20.7	35.16	114	37.9	1	7.68	36	16.7	12	12.67	33	11.8	15	51.75	37	5.1	21
30.7	36.30	108	38.0	6	8.04	35	15.5	9	13.00	32	10.3	14	52.12	34	7.2	25
June 9.7	37.38	99	38.6	10	8.39	32	14.6	6	13.32	30	8.9	13	52.46	32	9.7	29
19.6	38.37	89	39.6	15	8.71	30	14.0	4	13.62	27	7.6	12	52.78	28	12.6	31
29.6	39.26	75	41.1	19	9.01	26	13.6	2	13.89	24	6.4	9	53.06	23	15.7	33
July 9.6	40.01	61	43.0	22	9.27	22	13.4	1	14.13	20	5.5	8	53.29	18	19.0	34
19.5	40.62	44	45.2	24	9.49	18	13.5	3	14.33	16	4.7	6	53.47	13	22.4	34
29.5	41.06	26	47.6	26	9.67	12	13.8	6	14.49	11	4.1	3	53.60	7	25.8	33
Aug. 8.5	41.32	7	50.2	27	9.79	6	14.4	7	14.60	7	3.8	1	53.67	2	29.1	32
18.5	41.39	12	52.9	27	9.85	2	15.1	9	14.67	2	3.7	0	53.69	4	32.3	31
28.4	41.27	29	55.6	26	9.87	4	16.0	9	14.69	3	3.7	2	53.65	9	35.4	27
Sept. 7.4	40.98	47	58.2	24	9.83	8	16.9	10	14.66	6	3.9	3	53.56	13	38.1	24
17.4	40.51	61	60.6	21	9.75	12	17.9	10	14.60	10	4.2	4	53.43	17	40.5	21
27.4	39.90	73	62.7	16	9.63	15	18.9	9	14.50	13	4.6	5	53.26	21	42.6	17
Oct. 7.3	39.17	82	64.3	12	9.48	17	19.8	8	14.37	14	5.1	4	53.05	22	44.3	13
17.3	38.35	88	65.5	7	9.31	18	20.6	6	14.23	15	5.5	5	52.83	24	45.6	8
27.3	37.47	89	66.2	1	9.13	17	21.2	4	14.08	15	6.0	5	52.59	25	46.4	3
Nov. 6.2	36.58	86	66.3	5	8.96	17	21.6	3	13.93	14	6.5	4	52.34	23	46.7	2
16.2	35.72	80	65.8	11	8.79	14	21.9	0	13.79	12	6.9	3	52.11	22	46.5	6
26.2	34.92	71	64.7	17	8.65	12	21.9	3	13.67	10	7.2	2	51.89	20	45.9	12
Dec. 6.2	34.21	59	63.0	21	8.53	8	21.6	4	13.57	6	7.4	2	51.69	17	44.7	16
16.1	33.62	44	60.9	25	8.45	4	21.2	6	13.51	4	7.6	1	51.52	14	43.1	20
26.1	33.18	28	58.4	29	8.41	1	20.6	9	13.47	1	7.7	0	51.38	9	41.1	24
36.1	32.90		55.5		8.40		19.7		13.46		7.7		51.29		38.7	
ec δ, Tan δ	4.566		−4.455		1.187		−0.639		1.049		−0.317		1.381		+0.952	
ean Place	$27^{s}.658$		58″.34		$4^{s}.887$		26″.42		$10^{s}.251$		16″.91		$50^{s}.312$		18″.07	
$'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.09		+0.20		+0.01		+0.03		+0.01		+0.02		−0.02		−0.05	
$_{\psi}\delta$, $D_{\omega}\delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**61 Cygni *pr*.** Mag. 5.6				**ν Aquarii.** Mag. 4.5				**Bradley 2777.** Mag. 5.9				**3 Piscis Australis.** Mag. 5.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 21 3		° ′ +38 19		h m 21 4		° ′ −11 42		h m 21 7		° ′ +77 46		h m 21 8		° ′ −27 57	
	s		″		s		″		s		″		s		″	
Jan. 1.1	3.83	4	54.5	24	57.46	2	65.3	3	6.52	59	64.3	26	14.70	1	69.5	7
11.1	3.79	1	52.1	25	57.48	4	65.6	2	5.93	41	61.7	30	14.71	4	68.8	8
21.0	3.80	5	49.6	25	57.52	8	65.8	0	5.52	24	58.7	32	14.75	8	68.0	9
31.0	3.85	9	47.1	25	57.60	11	65.8	0	5.28	4	55.5	32	14.83	12	67.1	11
Feb. 10.0	3.94	13	44.6	23	57.71	14	65.8	2	5.24	16	52.3	32	14.95	15	66.0	12
20.0	4.07	18	42.3	21	57.85	16	65.6	4	5.40	35	49.1	31	15.10	18	64.8	13
Mar. 1.9	4.25	23	40.2	18	58.01	20	65.2	6	5.75	53	46.0	28	15.28	22	63.5	15
11.9	4.48	26	38.4	13	58.21	23	64.6	8	6.28	68	43.2	23	15.50	24	62.0	15
21.9	4.74	29	37.1	8	58.44	25	63.8	10	6.96	83	40.9	19	15.74	28	60.5	16
31.9	5.03	32	36.3	2	58.69	27	62.8	11	7.79	93	39.0	13	16.02	29	58.9	16
Apr. 10.8	5.35	35	36.1	3	58.96	29	61.7	13	8.72	101	37.7	7	16.31	32	57.3	17
20.8	5.70	36	36.4	8	59.25	31	60.4	15	9.73	105	37.0	1	16.63	34	55.6	16
30.8	6.06	37	37.2	14	59.56	32	58.9	16	10.78	106	36.9	5	16.97	35	54.0	16
May 10.7	6.43	36	38.6	18	59.88	32	57.3	16	11.84	103	37.4	12	17.32	35	52.4	15
20.7	6.79	36	40.4	23	60.20	32	55.7	17	12.87	97	38.6	17	17.67	35	50.9	13
30.7	7.15	34	42.7	27	60.52	31	54.0	16	13.84	89	40.3	22	18.02	34	49.6	11
June 9.7	7.49	30	45.4	29	60.83	29	52.4	16	14.73	78	42.5	27	18.36	32	48.5	10
19.6	7.79	28	48.3	31	61.12	27	50.8	14	15.51	64	45.2	31	18.68	30	47.5	7
29.6	8.07	23	51.4	33	61.39	24	49.4	13	16.15	50	48.3	33	18.98	26	46.8	5
July 9.6	8.30	18	54.7	34	61.63	20	48.1	11	16.65	34	51.6	36	19.24	23	46.3	2
19.6	8.48	14	58.1	33	61.83	16	47.0	9	16.99	17	55.2	37	19.47	17	46.1	0
29.5	8.62	8	61.4	33	61.99	11	46.1	7	17.16	0	58.9	37	19.64	13	46.1	3
Aug. 8.5	8.70	3	64.7	31	62.10	6	45.4	5	17.16	16	62.6	38	19.77	8	46.4	5
18.5	8.73	2	67.8	29	62.16	2	44.9	3	17.00	33	66.4	36	19.85	2	46.9	6
28.4	8.71	6	70.7	26	62.18	2	44.6	1	16.67	49	70.0	34	19.87	2	47.5	7
Sept. 7.4	8.65	11	73.3	23	62.16	6	44.5	0	16.18	62	73.4	32	19.85	6	48.2	8
17.4	8.54	15	75.6	20	62.10	9	44.5	2	15.56	75	76.6	29	19.79	10	49.0	9
27.4	8.39	17	77.6	16	62.01	12	44.7	2	14.81	86	79.5	24	19.69	14	49.9	8
Oct. 7.3	8.22	20	79.2	11	61.89	14	44.9	3	13.95	94	81.9	21	19.55	15	50.7	8
17.3	8.02	20	80.3	8	61.75	14	45.2	4	13.01	101	84.0	15	19.40	16	51.5	7
27.3	7.82	21	81.1	2	61.61	14	45.6	5	12.00	105	85.5	11	19.24	17	52.2	5
Nov. 6.3	7.61	20	81.3	2	61.47	14	46.1	4	10.95	105	86.6	4	19.07	15	52.7	3
16.2	7.41	18	81.1	6	61.33	12	46.5	4	9.90	104	87.0	1	18.92	14	53.0	2
26.2	7.23	16	80.5	11	61.21	9	46.9	4	8.86	99	86.9	8	18.78	11	53.2	0
Dec. 6.2	7.07	14	79.4	15	61.12	7	47.3	4	7.87	91	86.1	13	18.67	9	53.2	2
16.1	6.93	10	77.9	19	61.05	4	47.7	3	6.96	81	84.8	19	18.58	5	53.0	4
26.1	6.83	6	76.0	22	61.01	1	48.0	3	6.15	67	82.9	23	18.53	1	52.6	6
36.1	6.77		73.8		61.00		48.3		5.48		80.6		18.52		52.0	
Sec δ, Tan δ	1.275		+0.791		1.021		−0.207		4.726		+4.619		1.132		−0.531	
Mean Place	$5^s.095$		$50''.90$		$57^s.907$		$58''.97$		$13^s.487$		$54''.83$		$15^s.080$		$59''.99$	
$D'_\psi\alpha$, $D_\omega\alpha$	−0.01		−0.04		0.00		+0.01		−0.08		−0.22		+0.01		+0.03	
$D_\omega\delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Cygni. Mag. 3.4				τ Cygni. Mag. 3.8				α Equulei. Mag. 4.1				σ Cygni. Mag. 4.3			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 21 9		° ′ +29 52		h m 21 11		° ′ +37 40		h m 21 11		° ′ + 4 53		h m 21 14		° ′ +39 2	
	s		″		s		″		s		″		s		″	
Jan. 1.1	18.09		42.4		22.65		59.9		33.95		42.5		3.37		21.9	
11.1	18.06	3	40.2	22	22.60	5	57.6	23	33.95	0	41.3	12	3.30	7	19.6	23
21.0	18.06	0	38.0	22	22.58	2	55.1	25	33.98	3	40.2	11	3.28	2	17.1	25
31.0	18.10	4	35.7	23	22.61	3	52.5	26	34.04	6	39.2	10	3.30	2	14.4	27
Feb. 10.0	18.17	7	33.4	23	22.67	6	50.0	25	34.13	9	38.2	10	3.36	6	11.8	26
20.0	18.29	12	31.3	21	22.78	11	47.5	25	34.25	12	37.4	8	3.47	11	9.3	25
Mar. 1.9	18.44	15	29.5	18	22.94	16	45.3	22	34.41	16	36.9	5	3.62	15	7.1	22
11.9	18.63	19	27.9	16	23.14	20	43.5	18	34.59	18	36.6	3	3.82	20	5.2	19
21.9	18.86	23	26.8	11	23.38	24	42.1	14	34.80	21	36.6	0	4.06	24	3.7	15
31.9	19.12	26	26.1	7	23.65	27	41.1	10	35.04	24	36.9	3	4.33	27	2.6	11
Apr. 10.8	19.40	28	25.9	2	23.95	30	40.7	4	35.30	26	37.5	6	4.64	31	2.1	5
20.8	19.71	31	26.3	4	24.28	33	40.8	1	35.58	28	38.5	10	4.97	33	2.2	1
30.8	20.04	33	27.1	8	24.63	35	41.5	7	35.88	30	39.7	12	5.32	35	2.8	6
May 10.7	20.37	33	28.4	13	24.99	36	42.7	12	36.19	31	41.3	16	5.68	36	3.9	11
20.7	20.71	34	30.1	17	25.35	36	44.3	16	36.51	32	43.0	17	6.04	36	5.5	16
30.7	21.04	33	32.2	21	25.70	35	46.4	21	36.82	31	44.9	19	6.40	36	7.6	21
June 9.7	21.36	32	34.6	24	26.03	33	48.9	25	37.12	30	47.0	21	6.74	34	10.1	25
19.6	21.65	29	37.2	26	26.34	31	51.7	28	37.40	28	49.1	21	7.05	31	12.8	27
29.6	21.91	26	40.1	29	26.61	27	54.7	30	37.66	26	51.2	21	7.33	28	15.8	30
July 9.6	22.14	23	43.1	30	26.85	24	57.8	31	37.89	23	53.3	21	7.57	24	19.0	32
19.6	22.33	19	46.0	29	27.04	19	61.1	33	38.08	19	55.3	20	7.77	20	22.2	32
29.5	22.47	14	49.0	30	27.18	14	64.3	32	38.24	16	57.1	18	7.91	14	25.5	33
Aug. 8.5	22.56	9	51.9	29	27.27	9	67.5	32	38.35	11	58.8	17	8.00	9	28.7	32
18.5	22.60	4	54.6	27	27.31	4	70.6	31	38.41	6	60.2	14	8.04	4	31.8	31
28.4	22.60	0	57.1	25	27.30	1	73.4	28	38.43	2	61.5	13	8.03	1	34.7	29
Sept. 7.4	22.55	5	59.4	23	27.24	6	76.0	26	38.41	2	62.5	10	7.97	6	37.4	27
17.4	22.46	9	61.4	20	27.13	11	78.3	23	38.35	6	63.3	8	7.86	11	39.8	24
27.4	22.34	12	63.0	16	26.99	14	80.3	20	38.26	9	63.9	6	7.72	14	41.8	20
Oct. 7.3	22.19	15	64.3	13	26.82	17	81.9	16	38.14	12	64.3	4	7.55	17	43.4	16
17.3	22.02	17	65.3	10	26.63	19	83.1	12	38.01	13	64.5	2	7.35	20	44.7	13
27.3	21.84	18	65.8	5	26.43	20	83.9	8	37.87	14	64.4	1	7.14	21	45.5	8
Nov. 6.3	21.66	18	66.0	2	26.22	21	84.2	3	37.73	14	64.2	2	6.93	21	45.9	4
16.2	21.48	18	65.7	3	26.01	21	84.1	1	37.59	14	63.8	4	6.72	21	45.8	1
26.2	21.32	16	65.0	7	25.82	19	83.5	6	37.47	12	63.2	6	6.52	20	45.2	6
Dec. 6.2	21.17	15	64.0	10	25.65	17	82.4	11	37.37	10	62.4	8	6.34	18	44.2	10
16.1	21.05	12	62.6	14	25.50	15	81.0	14	37.29	8	61.5	9	6.19	15	42.7	15
26.1	20.96	9	60.9	17	25.38	12	79.1	19	37.24	5	60.5	10	6.06	13	40.9	18
36.1	20.90	6	58.9	20	25.30	8	77.0	21	37.22	2	59.4	11	5.98	8	38.7	22
Sec δ, Tan δ	1.153		+0.575		1.264		+0.772		1.004		+0.086		1.288		+0.811	
Mean Place	$19^{s}.072$		$39''.67$		$23^{s}.848$		$55''.52$		$34^{s}.507$		$45''.02$		$4^{s}.592$		$17''.08$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	−0.01		−0.03		−0.01		−0.04		0.00		0.00		−0.01		−0.04	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**θ¹ Microscopii.** Mag. 4.9				**α Cephei.** Mag. 2.6				**ι Capricorni.** Mag. 4.3				**1 Pegasi.** Mag. 4.2		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	21 15		−41 9		21 16		+62 13		21 17		−17 11		21 18		+19 2
	s		″		s		″		s		″		s		″
Jan. 1.1	19.22		81.9		30.46		39.3		30.60		57.0		8.58		26.1
11.1	19.22	0	80.6	13	30.25	21	36.7	26	30.60	0	57.0	0	8.56	2	24.4
21.1	19.25	3	79.0	16	30.11	14	33.8	29	30.63	3	56.8	2	8.57	1	22.6
31.0	19.33	8	77.3	17	30.06	5	30.7	31	30.70	7	56.5	3	8.61	4	20.8
Feb. 10.0	19.45	12	75.4	19	30.08	2	27.5	32	30.80	10	56.1	4	8.69	8	19.1
20.0	19.61	16	73.4	20	30.18	10	24.4	31	30.93	13	55.5	6	8.80	11	17.5
Mar. 1.9	19.81	20	71.3	21	30.37	19	21.5	29	31.09	16	54.8	7	8.94	14	16.1
11.9	20.04	23	69.2	21	30.63	26	18.9	26	31.28	19	53.9	9	9.12	18	15.1
21.9	20.31	27	67.1	21	30.97	34	16.7	22	31.50	22	52.8	11	9.33	21	14.4
31.9	20.62	31	65.0	21	31.37	40	15.0	17	31.74	24	51.6	12	9.57	24	14.1
Apr. 10.8	20.95	33	63.0	20	31.83	46	13.8	12	32.02	28	50.2	14	9.83	26	14.2
20.8	21.31	36	61.1	19	32.33	50	13.3	5	32.31	29	48.7	15	10.12	29	14.7
30.8	21.69	38	59.4	17	32.85	52	13.4	1	32.62	31	47.1	16	10.43	31	15.7
May 10.8	22.09	40	57.8	16	33.39	54	14.1	7	32.95	33	45.4	17	10.75	32	17.1
20.7	22.49	40	56.4	14	33.92	53	15.4	13	33.28	33	43.8	16	11.07	32	18.9
30.7	22.89	40	55.4	10	34.43	51	17.2	18	33.61	33	42.2	16	11.39	32	20.9
June 9.7	23.28	39	54.6	8	34.91	48	19.6	24	33.93	32	40.6	16	11.70	31	23.2
19.6	23.65	37	54.1	5	35.34	43	22.3	27	34.23	30	39.2	14	11.99	29	25.6
29.6	23.99	34	53.9	2	35.72	38	25.5	32	34.52	29	38.0	12	12.25	26	28.2
July 9.6	24.29	30	54.0	1	36.03	31	28.9	34	34.77	25	36.9	11	12.48	23	30.8
19.6	24.55	26	54.5	5	36.27	24	32.5	36	34.98	21	36.1	8	12.68	20	33.5
29.5	24.75	20	55.2	7	36.44	17	36.2	37	35.15	17	35.4	7	12.83	15	36.0
Aug. 8.5	24.91	16	56.2	10	36.52	8	39.9	37	35.28	13	35.0	4	12.94	11	38.4
18.5	25.00	9	57.4	12	36.51	1	43.6	37	35.36	8	34.8	2	13.00	6	40.7
28.5	25.03	3	58.7	13	36.43	8	47.1	35	35.40	4	34.8	0	13.02	2	42.8
Sept. 7.4	25.01	2	60.1	14	36.28	15	50.4	33	35.39	1	35.0	2	12.99	3	44.6
17.4	24.93	8	61.5	14	36.05	23	53.5	31	35.34	5	35.3	3	12.93	6	46.1
27.4	24.81	12	62.9	14	35.77	28	56.2	27	35.25	9	35.7	4	12.83	10	47.4
Oct. 7.3	24.65	16	64.2	13	35.43	34	58.5	23	35.14	11	36.2	5	12.70	13	48.4
17.3	24.47	18	65.3	11	35.06	37	60.4	19	35.00	14	36.7	5	12.56	14	49.0
27.3	24.27	20	66.1	8	34.66	40	61.8	14	34.86	14	37.2	5	12.41	15	49.4
Nov. 6.3	24.07	20	66.7	6	34.24	42	62.7	9	34.71	15	37.7	5	12.25	16	49.4
16.2	23.87	20	67.0	3	33.82	42	63.0	3	34.57	14	38.2	5	12.10	15	49.1
26.2	23.69	18	67.0	0	33.41	41	62.7	3	34.45	12	38.6	4	11.96	14	48.5
Dec. 6.2	23.54	15	66.6	4	33.02	39	61.9	8	34.35	10	38.9	3	11.84	12	47.6
16.2	23.42	12	65.9	7	32.67	35	60.5	14	34.27	8	39.1	2	11.74	10	46.4
26.1	23.35	7	65.0	9	32.37	30	58.6	19	34.22	5	39.2	1	11.67	7	45.0
36.1	23.31	4	63.8	12	32.12	25	56.2	24	34.20	2	39.2	0	11.62	5	43.4
Sec δ, Tan δ	1.328		−0.874		2.146		+1.899		1.047		−0.310		1.060		+0.353
Mean Place	$19^{s}.599$		70″.24		$33^{s}.153$		30″.51		$30^{s}.963$		49″.76		$9^{s}.316$		25″.06
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.02		+0.04		−0.03		−0.10		+0.01		+0.02		−0.01		−0.02
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	γ Pavonis. Mag. 4.3				ζ Capricorni. Mag. 3.9				g Cygni. Mag. 5.3				β Aquarii. Mag. 3.1			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 19		−65 44		21 21		−22 46		21 26		+46 9		21 27		− 5 56	
	s		″		s		″		s		″		s		″	
an. 1.1	25.08	10	81.1	26	48.70	0	56.8	4	17.26	10	62.7	24	4.73	1	49.1	6
11.1	24.98	1	78.5	28	48.70	3	56.4	5	17.16	6	60.3	26	4.72	2	49.7	5
21.1	24.97	7	75.7	30	48.73	6	55.9	6	17.10	1	57.7	28	4.74	5	50.2	3
31.0	25.04	15	72.7	31	48.79	10	55.3	8	17.09	4	54.9	28	4.79	9	50.5	3
Feb. 10.0	25.19	23	69.6	32	48.89	13	54.5	9	17.13	9	52.1	27	4.88	11	50.8	1
20.0	25.42	31	66.4	32	49.02	16	53.6	11	17.22	14	49.4	26	4.99	14	50.9	1
Mar. 1.9	25.73	38	63.2	30	49.18	19	52.5	12	17.36	20	46.8	22	5.13	17	50.8	3
11.9	26.11	45	60.2	30	49.37	23	51.3	14	17.56	24	44.6	18	5.30	20	50.5	6
21.9	26.56	50	57.2	27	49.60	25	49.9	15	17.80	29	42.8	14	5.50	23	49.9	8
31.9	27.06	56	54.5	24	49.85	28	48.4	16	18.09	32	41.4	8	5.73	26	49.1	10
Apr. 10.8	27.62	60	52.1	22	50.13	30	46.8	16	18.41	36	40.6	2	5.99	28	48.1	13
20.8	28.22	63	49.9	18	50.43	32	45.2	17	18.77	38	40.4	3	6.27	30	46.8	14
30.8	28.85	65	48.1	14	50.75	33	43.5	17	19.15	39	40.7	9	6.57	31	45.4	17
May 10.8	29.50	66	46.7	10	51.08	34	41.8	16	19.54	39	41.6	15	6.88	32	43.7	17
20.7	30.16	66	45.7	5	51.42	34	40.2	16	19.93	39	43.1	19	7.20	32	42.0	18
30.7	30.82	64	45.2	1	51.76	33	38.6	14	20.32	38	45.0	24	7.52	31	40.2	19
une 9.7	31.46	60	45.1	3	52.09	32	37.2	12	20.70	34	47.4	27	7.83	29	38.3	18
19.6	32.06	55	45.4	7	52.41	29	36.0	10	21.04	31	50.1	30	8.12	28	36.5	17
29.6	32.61	49	46.1	12	52.70	26	35.0	8	21.35	27	53.1	33	8.40	24	34.8	16
July 9.6	33.10	41	47.3	16	52.96	23	34.2	6	21.62	21	56.4	34	8.64	21	33.2	15
19.6	33.51	33	48.9	18	53.19	18	33.6	3	21.83	17	59.8	34	8.85	17	31.7	13
29.5	33.84	22	50.7	21	53.37	14	33.3	1	22.00	10	63.2	35	9.02	13	30.4	11
Aug. 8.5	34.06	13	52.8	23	53.51	9	33.2	1	22.10	5	66.7	33	9.15	9	29.3	9
18.5	34.19	2	55.1	24	53.60	4	33.3	3	22.15	1	70.0	32	9.24	4	28.4	7
28.5	34.21	8	57.5	24	53.64	1	33.6	5	22.14	6	73.2	30	9.28	0	27.7	4
Sept. 7.4	34.13	17	59.9	22	53.63	5	34.1	6	22.08	11	76.2	27	9.28	4	27.3	3
17.4	33.96	26	62.1	21	53.58	8	34.7	7	21.97	16	78.9	24	9.24	8	27.0	1
27.4	33.70	33	64.2	18	53.50	12	35.4	7	21.81	19	81.3	19	9.16	10	26.9	0
Oct. 7.3	33.37	38	66.0	14	53.38	14	36.1	7	21.62	22	83.2	16	9.06	12	26.9	2
17.3	32.99	42	67.4	10	53.24	15	36.8	6	21.40	23	84.8	12	8.94	14	27.1	3
27.3	32.57	43	68.4	5	53.09	15	37.4	6	21.17	25	86.0	6	8.80	14	27.4	4
Nov. 6.3	32.14	43	68.9	0	52.94	15	38.0	4	20.92	24	86.6	2	8.66	13	27.8	5
16.2	31.71	41	68.9	5	52.79	13	38.4	3	20.68	24	86.8	4	8.53	12	28.3	5
26.2	31.30	36	68.4	11	52.66	11	38.7	2	20.44	22	86.4	9	8.41	10	28.8	5
Dec. 6.2	30.94	30	67.3	15	52.55	9	38.9	0	20.22	20	85.5	13	8.31	8	29.3	6
16.2	30.64	23	65.8	20	52.46	5	38.9	1	20.02	16	84.2	18	8.23	6	29.9	5
26.1	30.41	16	63.8	24	52.41	3	38.8	2	19.86	13	82.4	22	8.17	3	30.4	6
36.1	30.25		61.4		52.38		38.6		19.73		80.2		8.14		31.0	
ec δ, Tan δ	2.435		−2.220		1.085		−0.420		1.444		+1.042		+1.005		−0.104	
Mean Place	$25^{s}.871$		$66''.49$		$49^{s}.032$		$48''.36$		$18^{s}.716$		$55''.50$		$5^{s}.123$		$44''.59$	
$Y_\psi a$, $D_\omega a$	+0.04		+0.11		+0.01		+0.02		−0.02		−0.05		0.00		+0.01	
$_\psi \delta$, $D_\omega \delta$	+0.3		−0.6		+0.3		−0.6		+0.3		−0.6		+0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**β Cephei.** Mag. 3.3				**ξ Aquarii.** Mag. 4.8				**74 Cygni.** Mag. 5.1				**γ Capricorni.** Mag. 3.8		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declin- tion S.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	21 27		+70 10		21 33		− 8 13		21 33		+40 1		21 35		−17
	s		″		s		″		s		″		s		″
Jan. 1.1	30.27	36	85.5	25	13.34	1	74.3	4	31.31	8	58.8	22	22.73	1	55.2
11.1	29.91	26	83.0	29	13.33	2	74.7	4	31.23	5	56.6	24	22.72	1	55.2
21.1	29.65	15	80.1	31	13.35	5	75.1	2	31.18	0	54.2	26	22.73	5	55.0
31.0	29.50	4	77.0	32	13.40	7	75.3	1	31.18	3	51.6	26	22.78	8	54.7
Feb. 10.0	29.46	8	73.8	32	13.47	11	75.4	1	31.21	9	49.0	25	22.86	11	54.2
20.0	29.54	19	70.6	31	13.58	14	75.3	2	31.30	13	46.5	23	22.97	14	53.6
Mar. 2.0	29.73	31	67.5	28	13.72	17	75.1	5	31.43	18	44.2	20	23.11	18	52.8
11.9	30.04	41	64.7	24	13.89	19	74.6	7	31.61	22	42.2	16	23.29	20	51.9
21.9	30.45	51	62.3	19	14.08	23	73.9	9	31.83	25	40.6	12	23.49	23	50.8
31.9	30.96	58	60.4	14	14.31	25	73.0	11	32.08	30	39.4	7	23.72	26	49.5
Apr. 10.8	31.54	64	59.0	9	14.56	28	71.9	13	32.38	33	38.7	1	23.98	29	48.0
20.8	32.18	68	58.1	2	14.84	30	70.6	15	32.71	35	38.6	4	24.27	30	46.4
30.8	32.86	70	57.9	4	15.14	31	69.1	17	33.06	36	39.0	10	24.57	32	44.7
May 10.8	33.56	69	58.3	11	15.45	32	67.4	18	33.42	37	40.0	14	24.89	33	43.0
20.7	34.25	67	59.4	16	15.77	32	65.6	18	33.79	37	41.4	19	25.22	33	41.2
30.7	34.92	63	61.0	21	16.09	32	63.8	18	34.16	35	43.3	24	25.55	33	39.5
June 9.7	35.55	57	63.1	26	16.41	30	62.0	17	34.51	33	45.7	26	25.88	31	37.9
19.7	36.12	50	65.7	30	16.71	28	60.3	17	34.84	30	48.3	29	26.19	30	36.4
29.6	36.62	41	68.7	33	16.99	25	58.6	15	35.14	26	51.2	32	26.49	26	35.1
July 9.6	37.03	32	72.0	36	17.24	22	57.1	14	35.40	22	54.4	32	26.75	23	33.9
19.6	37.35	21	75.6	37	17.46	18	55.7	12	35.62	17	57.6	33	26.98	19	33.0
29.5	37.56	10	79.3	38	17.64	13	54.5	10	35.79	12	60.9	33	27.17	14	32.3
Aug. 8.5	37.66	1	83.1	37	17.77	9	53.5	7	35.91	6	64.2	31	27.31	10	31.8
18.5	37.65	11	86.8	37	17.86	5	52.8	6	35.97	2	67.3	30	27.41	5	31.6
28.5	37.54	21	90.5	35	17.91	1	52.2	3	35.99	4	70.3	28	27.46	1	31.6
Sept. 7.4	37.33	31	94.0	33	17.92	4	51.9	2	35.95	9	73.1	25	27.47	3	31.7
17.4	37.02	39	97.3	30	17.88	7	51.7	0	35.86	12	75.6	22	27.44	8	32.0
27.4	36.63	46	100.3	26	17.81	10	51.7	2	35.74	16	77.8	19	27.36	10	32.5
Oct. 7.4	36.17	52	102.9	22	17.71	12	51.9	3	35.58	18	79.7	15	27.26	12	33.0
17.3	35.65	57	105.1	17	17.59	13	52.2	3	35.40	20	81.2	10	27.14	14	33.6
27.3	35.08	59	106.8	12	17.46	13	52.5	4	35.20	21	82.2	6	27.00	14	34.2
Nov. 6.3	34.49	61	108.0	6	17.33	13	52.9	5	34.99	21	82.8	1	26.86	14	34.7
16.2	33.88	61	108.6	0	17.20	13	53.4	5	34.78	20	82.9	4	26.72	12	35.2
26.2	33.27	57	108.6	6	17.07	10	53.9	5	34.58	19	82.5	8	26.60	11	35.7
Dec. 6.2	32.70	54	108.0	11	16.97	8	54.4	5	34.39	17	81.7	13	26.49	9	36.0
16.2	32.16	49	106.9	17	16.89	6	54.9	5	34.22	14	80.4	17	26.40	6	36.3
26.1	31.67	41	105.2	23	16.83	3	55.4	5	34.08	10	78.7	20	26.34	3	36.4
36.1	31.26		102.9		16.80		55.9		33.98		76.7		26.31		36.5
Sec δ, Tan δ	2.951		+2.776		1.010		−0.145		1.306		+0.840		1.046		−0.307
Mean Place	$34^s.161$		$74''.66$		$13^s.698$		$69''.39$		$32^s.484$		$52''.30$		$23^s.022$		$48''.24$
$D'_\psi\alpha$, $D_\omega\alpha$	−0.05		−0.15		0.00		+0.01		−0.01		−0.04		0.00		+0.02
$D_\psi\delta$, $D_\omega\delta$	+0.3		−0.6		+0.3		−0.6		+0.3		−0.6		+0.3		−0.6

ean Solar Date.	λ Octantis. Mag. 5.4				ε Pegasi. Mag. 2.5				11 Cephei. Mag. 4.8				δ Capricorni. Mag. 3.0			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 37		−83 6		21 40		+ 9 28		21 40		+70 54		21 42		−16 30	
	s		″		s		″		s		″		s		″	
an. 1.1	57.49		55.4		0.17		64.9		36.93		83.6		20.81		55.5	
11.1	56.74	75	52.4	30	0.14	3	63.7	12	36.53	40	81.2	24	20.79	2	55.5	0
21.1	56.28	46	49.0	34	0.14	0	62.4	13	36.22	31	78.5	27	20.80	1	55.3	2
31.0	56.13	15	45.4	36	0.17	3	61.2	12	36.02	20	75.5	30	20.84	4	55.1	2
eb. 10.0	56.28	15	41.7	37	0.23	6	60.1	11	35.94	8	72.3	32	20.91	7	54.7	4
20.0	56.72	44	38.0	37	0.32	9	59.0	11	35.98	4	69.1	32	21.01	10	54.1	6
ar. 2.0	57.45	73	34.3	37	0.44	12	58.2	8	36.15	17	66.0	31	21.15	14	53.3	8
11.9	58.44	99	30.8	35	0.60	16	57.7	5	36.43	28	63.1	29	21.31	16	52.3	10
21.9	59.67	123	27.4	34	0.78	18	57.5	2	36.83	40	60.6	25	21.51	20	51.2	11
31.9	61.12	145	24.3	31	1.00	22	57.6	1	37.32	49	58.5	21	21.74	23	49.9	13
pr. 10.9	62.75	163	21.6	27	1.25	25	58.0	4	37.90	58	56.9	16	21.99	25	48.5	14
20.8	64.53	178	19.3	23	1.52	27	58.8	8	38.55	65	56.0	9	22.27	28	46.9	16
30.8	66.42	189	17.4	19	1.81	29	60.0	12	39.25	70	55.6	4	22.57	30	45.2	17
ay 10.8	68.39	197	16.0	14	2.12	31	61.4	14	39.97	72	55.8	2	22.89	32	43.4	18
20.7	70.39	200	15.1	9	2.44	32	63.1	17	40.69	72	56.7	9	23.22	33	41.7	17
30.7	72.39	200	14.7	4	2.75	31	65.1	20	41.39	70	58.1	14	23.55	33	39.9	18
une 9.7	74.34	195	14.8	1	3.06	31	67.2	21	42.06	67	60.1	20	23.88	33	38.2	17
19.7	76.18	184	15.5	7	3.36	30	69.4	22	42.68	62	62.6	25	24.19	31	36.7	15
29.6	77.87	169	16.6	11	3.64	28	71.7	23	43.22	54	65.5	29	24.49	30	35.3	14
uly 9.6	79.38	151	18.2	16	3.89	25	74.0	23	43.67	45	68.7	32	24.76	27	34.1	12
19.6	80.65	127	20.2	20	4.10	21	76.2	22	44.03	36	72.2	35	24.99	23	33.1	10
29.6	81.65	100	22.5	23	4.28	18	78.3	21	44.29	26	75.8	36	25.18	19	32.4	7
ug. 8.5	82.35	70	25.1	26	4.41	13	80.3	20	44.43	14	79.6	38	25.33	15	31.9	5
18.5	82.72	37	27.9	28	4.50	9	82.1	18	44.47	4	83.4	38	25.44	11	31.6	3
28.5	82.76	4	30.8	29	4.55	5	83.7	16	44.39	8	87.2	38	25.50	6	31.5	1
ept. 7.4	82.47	29	33.6	28	4.55	0	85.0	13	44.21	18	90.8	36	25.52	2	31.7	2
17.4	81.85	62	36.3	27	4.51	4	86.1	11	43.93	28	94.2	34	25.49	3	32.0	3
27.4	80.93	92	38.8	25	4.44	7	87.0	9	43.56	37	97.3	31	25.42	7	32.4	4
ct. 7.4	79.74	119	40.9	21	4.34	10	87.6	6	43.11	45	100.0	27	25.33	9	32.9	5
17.3	78.34	140	42.6	17	4.23	11	88.0	4	42.60	51	102.4	24	25.21	12	33.5	6
27.3	76.77	157	43.8	12	4.10	13	88.2	2	42.03	57	104.3	19	25.07	14	34.1	6
ov. 6.3	75.10	167	44.4	6	3.96	14	88.1	1	41.43	60	105.7	14	24.93	14	34.7	6
16.3	73.40	170	44.4	0	3.82	14	87.8	3	40.81	62	106.5	8	24.80	13	35.3	6
26.2	71.74	166	43.7	7	3.70	12	87.2	6	40.19	62	106.7	2	24.67	13	35.7	4
ec. 6.2	70.18	156	42.5	12	3.59	11	86.5	7	39.58	61	106.3	4	24.56	11	36.1	4
16.2	68.78	140	40.6	19	3.49	10	85.6	9	39.01	57	105.4	9	24.47	9	36.4	3
26.1	67.59	119	38.3	23	3.42	7	84.6	10	38.49	52	103.8	16	24.40	7	36.6	2
36.1	66.65	94	35.5	28	3.37	5	83.4	12	38.04	45	101.8	20	24.37	3	36.7	1
c δ, Tan δ	8.336		−8.275		1.014		+0.167		3.059		+2.891		1.043		−0.297	
an Place	$60^{s}.495$		39″.62		$0^{s}.661$		65″.14		$40^{s}.840$		71″.41		$21^{s}.070$		48″.75	
$\psi\alpha$, $D_{\psi}\alpha$	+0.13		+0.45		0.00		−0.01		−0.04		−0.16		0.00		+0.02	
$\psi\delta$, $D_{\psi}\delta$	+0.3		−0.6		+0.3		−0.6		+0.3		−0.6		+0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**π² Cygni.** Mag. 4.3				**μ Capricorni.** Mag. 5.2				**γ Gruis.** Mag. 3.2				**16 Pegasi.** Mag. 5.0		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.
	h m 21 43		° ′ +48 54		h m 21 48		° ′ −13 56		h m 21 48		° ′ −37 45		h m 21 49		° +25 3
	s		″		s		″		s		″		s		″
Jan. 1.1	37.62	13	66.3	22	39.55	3	75.1	1	46.96	4	66.1	10	10.91	6	33.8
11.1	37.49	9	64.1	26	39.52	1	75.2	0	46.92	1	65.1	13	10.85	2	32.0
21.1	37.40	4	61.5	28	39.53	3	75.2	1	46.91	3	63.8	16	10.83	0	30.1
31.0	37.36	1	58.7	28	39.56	6	75.1	3	46.94	7	62.2	17	10.83	4	28.1
Feb. 10.0	37.37	6	55.9	28	39.62	10	74.8	5	47.01	11	60.5	19	10.87	8	26.2
20.0	37.43	12	53.1	26	39.72	12	74.3	6	47.12	15	58.6	20	10.95	11	24.4
Mar. 2.0	37.55	18	50.5	24	39.84	16	73.7	8	47.27	19	56.6	21	11.06	15	22.7
11.9	37.73	23	48.1	20	40.00	19	72.9	10	47.46	22	54.5	22	11.21	18	21.3
21.9	37.96	28	46.1	15	40.19	22	71.9	12	47.68	26	52.3	22	11.39	22	20.3
31.9	38.24	33	44.6	11	40.41	25	70.7	14	47.94	29	50.1	22	11.61	26	19.6
Apr. 10.9	38.57	36	43.5	5	40.66	27	69.3	16	48.23	32	47.9	22	11.87	28	19.4
20.8	38.93	39	43.0	1	40.93	30	67.7	17	48.55	34	45.7	21	12.15	30	19.6
30.8	39.32	40	43.1	7	41.23	31	66.0	17	48.89	37	43.6	19	12.45	33	20.3
May 10.8	39.72	41	43.8	12	41.54	32	64.3	18	49.26	38	41.7	17	12.78	33	21.4
20.7	40.13	41	45.0	18	41.86	33	62.5	18	49.64	39	40.0	15	13.11	33	23.0
30.7	40.54	40	46.8	22	42.19	33	60.7	18	50.03	38	38.5	12	13.44	33	24.9
June 9.7	40.94	37	49.0	26	42.52	31	58.9	17	50.41	37	37.3	9	13.77	31	27.1
19.7	41.31	34	51.6	30	42.83	30	57.2	15	50.78	35	36.4	6	14.08	29	29.6
29.6	41.65	29	54.6	32	43.13	26	55.7	13	51.13	31	35.8	3	14.37	26	32.2
July 9.6	41.94	25	57.8	33	43.39	24	54.4	12	51.44	28	35.5	1	14.63	22	35.0
19.6	42.19	19	61.1	35	43.63	20	53.2	9	51.72	23	35.6	4	14.85	19	37.8
29.6	42.38	13	64.6	35	43.83	15	52.3	7	51.95	19	36.0	7	15.04	14	40.6
Aug. 8.5	42.51	7	68.1	35	43.98	12	51.6	4	52.14	13	36.7	9	15.18	9	43.3
18.5	42.58	1	71.6	33	44.10	6	51.2	2	52.27	7	37.6	11	15.27	4	46.0
28.5	42.59	4	74.9	31	44.16	2	51.0	0	52.34	2	38.7	13	15.31	1	48.4
Sept. 7.4	42.55	10	78.0	29	44.18	2	51.0	1	52.36	4	40.0	14	15.32	5	50.6
17.4	42.45	14	80.9	26	44.16	6	51.1	3	52.32	8	41.4	14	15.27	7	52.6
27.4	42.31	18	83.5	23	44.10	9	51.4	4	52.24	12	42.8	14	15.20	11	54.3
Oct. 7.4	42.13	22	85.8	18	44.01	11	51.8	5	52.12	16	44.2	12	15.09	13	55.6
17.3	41.91	24	87.6	14	43.90	13	52.3	6	51.96	17	45.4	11	14.96	15	56.7
27.3	41.67	25	89.0	9	43.77	14	52.9	5	51.79	18	46.5	9	14.81	16	57.4
Nov. 6.3	41.42	26	89.9	4	43.63	13	53.4	6	51.61	18	47.4	6	14.65	15	57.7
16.3	41.16	25	90.3	2	43.50	13	54.0	5	51.43	17	48.0	3	14.50	15	57.7
26.2	40.91	24	90.1	6	43.37	11	54.5	4	51.26	16	48.3	0	14.35	14	57.3
Dec. 6.2	40.67	22	89.5	12	43.26	9	54.9	4	51.10	13	48.3	3	14.21	13	56.6
16.2	40.45	19	88.3	16	43.17	7	55.3	3	50.97	10	48.0	7	14.08	10	55.5
26.1	40.26	16	86.7	21	43.10	4	55.6	2	50.87	6	47.3	9	13.98	8	54.1
36.1	40.10		84.6		43.06		55.8		50.81		46.4		13.90		52.5
Sec δ, Tan δ	1.522		+1.147		1.030		−0.248		1.265		−0.775		1.108		+0.478
Mean Place	39ˢ.110		57″.23		39ˢ.795		69″.12		47ˢ.133		54″.84		11ˢ.625		29″.46
D′ψ α, Dω α	−0.02		−0.06		0.00		+0.01		+0.01		+0.04		−0.01		−0.03
Dψ δ, Dω δ	+0.3		−0.6		+0.3		−0.5		+0.3		−0.5		+0.3		−0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**79 Draconis.** Mag. 6.6				**ε Indi.** Mag. 4.7				**20 Pegasi.** Mag. 5.7				**α Aquarii.** Mag. 3.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 51		+73 17		21 56		−57 7		21 56		+12 42		22 1		− 0 43	
	s		″		s		″		s		″		s		″	
Jan. 1.1	43.42		73.4		51.67		83.4		56.41		45.6		24.84		61.6	
11.1	42.92	50	71.2	22	51.57	10	81.5	19	56.37	4	44.3	13	24.80	4	62.3	7
21.1	42.53	39	68.6	26	51.52	5	79.3	22	56.35	2	43.0	13	24.79	1	63.0	7
31.1	42.26	27	65.6	30	51.53	1	76.8	25	56.36	1	41.6	14	24.81	2	63.6	6
Feb. 10.0	42.12	14	62.5	31	51.60	7	74.1	27	56.40	4	40.3	13	24.85	4	64.1	5
20.0	42.11	1	59.3	32	51.73	13	71.3	28	56.47	7	39.2	11	24.93	8	64.5	4
Mar. 2.0	42.25	14	56.2	31	51.92	19	68.4	29	56.58	11	38.2	10	25.03	10	64.6	1
11.9	42.53	28	53.2	30	52.16	24	65.5	29	56.72	14	37.5	7	25.17	14	64.5	1
21.9	42.94	41	50.6	26	52.46	30	62.6	29	56.89	17	37.1	4	25.34	17	64.2	3
31.9	43.47	53	48.4	22	52.81	35	59.8	28	57.10	21	37.0	1	25.54	20	63.6	6
Apr. 10.9	44.10	63	46.7	17	53.20	39	57.1	27	57.33	23	37.3	3	25.77	23	62.8	8
20.8	44.81	71	45.5	12	53.64	44	54.7	24	57.60	27	38.0	7	26.03	26	61.6	12
30.8	45.58	77	44.9	6	54.12	48	52.5	22	57.88	28	39.0	10	26.31	28	60.2	14
May 10.8	46.38	80	44.9	0	54.62	50	50.6	19	58.19	31	40.4	14	26.61	30	58.6	16
20.8	47.19	81	45.6	7	55.14	52	49.0	16	58.51	32	42.0	16	26.93	32	56.8	18
30.7	47.99	80	46.9	13	55.67	53	47.9	11	58.83	32	43.9	19	27.25	32	54.9	19
June 9.7	48.75	76	48.7	18	56.20	53	47.2	7	59.14	31	46.0	21	27.56	31	52.9	20
19.7	49.46	71	51.0	23	56.71	51	46.9	3	59.45	31	48.3	23	27.87	31	50.9	20
29.6	50.08	62	53.8	28	57.19	48	47.0	1	59.74	29	50.7	24	28.16	29	48.9	20
July 9.6	50.61	53	56.9	31	57.64	45	47.5	5	60.00	26	53.1	24	28.42	26	47.0	19
19.6	51.04	43	60.3	34	58.03	39	48.5	10	60.23	23	55.4	23	28.66	24	45.2	18
29.6	51.35	31	63.9	36	58.36	33	49.8	13	60.42	19	57.7	23	28.85	19	43.5	17
Aug. 8.5	51.54	19	67.7	38	58.62	26	51.5	17	60.56	14	59.8	21	29.01	16	42.1	14
18.5	51.61	7	71.5	38	58.80	18	53.5	20	60.67	11	61.8	20	29.13	12	40.8	13
28.5	51.55	6	75.3	38	58.91	11	55.6	21	60.73	6	63.6	18	29.20	7	39.8	10
Sept. 7.5	51.38	17	79.0	37	58.93	2	57.9	23	60.75	2	65.2	16	29.22	2	39.0	8
17.4	51.09	29	82.5	35	58.88	5	60.1	22	60.73	2	66.5	13	29.21	1	38.4	6
27.4	50.69	40	85.7	32	58.77	11	62.3	22	60.67	6	67.6	11	29.17	4	38.0	4
Oct. 7.4	50.21	48	88.7	30	58.59	18	64.4	21	60.58	9	68.4	8	29.09	8	37.9	1
17.3	49.65	56	91.2	25	58.36	23	66.2	18	60.47	11	68.9	5	28.99	10	37.9	0
27.3	49.02	63	93.3	21	58.10	26	67.7	15	60.35	12	69.2	3	28.87	12	38.0	1
Nov. 6.3	48.34	68	94.9	16	57.81	29	68.8	11	60.22	13	69.3	1	28.75	12	38.3	3
16.3	47.63	71	95.9	10	57.52	29	69.4	6	60.08	14	69.1	2	28.62	13	38.7	4
26.2	46.92	71	96.3	4	57.24	28	69.6	2	59.95	13	68.6	5	28.50	12	39.2	5
Dec. 6.2	46.21	71	96.2	1	56.98	26	69.3	3	59.84	11	68.0	6	28.39	11	39.8	6
16.2	45.54	67	95.4	8	56.75	23	68.5	8	59.73	11	67.1	9	28.30	9	40.5	7
26.2	44.92	62	94.0	14	56.56	19	67.2	13	59.65	8	66.0	11	28.22	8	41.2	7
36.1	44.37	55	92.1	19	56.42	14	65.6	16	59.59	6	64.8	12	28.17	5	42.0	8
ec δ, Tan δ	3.481		+3.334		1.843		−1.548		1.025		+0.226		1.000		−0.013	
lean Place	47ˢ.810		59″.98		51ˢ.886		68″.91		56ˢ.871		44″.19		25ˢ.131		59″.46	
$_{\psi}\alpha$, $D_{\omega}\alpha$	−0.05		−0.19		+0.02		+0.09		0.00		−0.01		0.00		0.00	
$_{\psi}\delta$, $D_{\omega}\delta$	+0.3		−0.5		+0.3		−0.5		+0.3		−0.5		+0.3		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**β Indi.** Mag. 3.7				**32 Vulpeculæ.** Mag. 5.2				**220 Draconis** (Heis). Mag. 5.6				**ν Cygni.** Mag. 4.0			
	Right Ascension		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		°	
	20 48		−58 46		20 50		+27 43		20 51		+80 13		20 53		+40 5	
	s		″		s		″		s		″		s		″	
Jan. 1.1	9.75		45.0		55.23		62.7		19.87		71.1		58.84		25.2	
11.1	9.74	1	42.6	24	55.22	1	60.6	21	19.18	69	68.4	27	58.79	5	22.6	[illegible]
21.0	9.81	7	40.1	25	55.24	2	58.3	23	18.70	48	65.3	31	58.79	0	19.9	[illegible]
31.0	9.95	14	37.5	26	55.30	6	56.0	23	18 47	23	62.1	32	58.83	4	17.2	[illegible]
Feb. 10.0	10.15	20	34.7	28	55.40	10	53.8	22	18.48	1	58.9	32	58.92	9	14.5	[illegible]
20.0	10.41	26	32.0	27	55.54	14	51.8	20	18.74	26	55.7	32	59.05	13	11.9	[illegible]
Mar. 1.9	10.73	32	29.4	26	55.71	17	50.1	17	19.23	49	52.7	30	59.23	18	9.6	[illegible]
11.9	11.10	37	26.8	26	55.92	21	48.7	14	19.94	71	50.0	27	59.45	22	7.7	[illegible]
21.9	11.52	42	24.4	24	56.15	23	47.7	10	20.85	91	47.7	23	59.71	26	6.3	[illegible]
31.8	11.98	46	22.1	23	56.42	27	47.2	5	21.91	106	46.0	17	60.00	29	5.3	[illegible]
Apr. 10.8	12.47	49	20.1	20	56.71	29	47.2	0	23.09	118	44.8	12	60.33	33	4.9	[illegible]
20.8	12.99	52	18.4	17	57.02	31	47.6	4	24.35	126	44.3	5	60.67	34	5.1	[illegible]
30.8	13 52	53	17.0	14	57.35	33	48.6	10	25.64	129	44.4	1	61.03	36	5.8	[illegible]
May 10.7	14.07	55	16.0	10	57.68	33	50.0	14	26.93	129	45.1	7	61.40	37	7.1	13
20.7	14.62	55	15.3	7	58.00	32	51.8	18	28.16	123	46.4	13	61.76	36	8.8	17
30.7	15.15	53	15.0	3	58.32	32	54.0	22	29.30	114	48.2	18	62.11	35	11.0	[illegible]
June 9.7	15.66	51	15.1	1	58.63	31	56.5	25	30.33	103	50.6	24	62.45	34	13.6	[illegible]
19.6	16.13	47	15.5	4	58.91	28	59.2	27	31.20	87	53.3	27	62.75	30	16.5	[illegible]
29.6	16.56	43	16.4	9	59.15	24	62.1	29	31.90	70	56.5	32	63.01	26	19.6	[illegible]
July 9.6	16.93	37	17.6	12	59.36	21	65.0	29	32.40	50	59.9	34	63.23	22	22.9	[illegible]
19.5	17.23	30	19.0	14	59.53	17	67.9	29	32.71	31	63.4	35	63.40	17	26.2	33
29.5	17.45	22	20.8	18	59.65	12	70.8	29	32.80	9	67.1	37	63.52	12	29.5	33
Aug. 8.5	17.60	15	22.7	19	59.72	7	73.5	27	32.68	12	70.8	37	63.59	7	32.7	32
18.5	17.66	6	24.7	20	59.75	3	76.1	26	32.35	33	74.4	36	63.60	1	35.8	31
28.4	17.64	2	26.8	21	59.73	2	78.4	23	31.82	53	78.0	36	63.56	4	38.7	29
Sept. 7.4	17.54	10	28.9	21	59.66	7	80.5	21	31.11	71	81.3	33	63.46	10	41.3	26
17.4	17.37	17	30.8	19	59.56	10	82.3	18	30.23	88	84.3	30	63.33	13	43.6	23
27.4	17.13	24	32.5	17	59.42	14	83.8	15	29.20	103	87.0	27	63.16	17	45.6	20
Oct. 7.3	16.85	28	33.9	14	59.26	16	84.9	11	28.05	115	89.3	23	62.96	20	47.1	15
17.3	16.54	31	34.9	10	59.09	17	85.6	7	26.79	126	91.2	19	62.74	22	48.2	11
27.3	16.21	33	35.6	7	58.91	18	86.0	4	25.47	132	92.5	13	62.51	23	48.8	6
Nov. 6.2	15.88	33	35.8	2	58.72	19	85.9	1	24.12	135	93.3	8	62.28	23	49.0	2
16.2	15.56	32	35.5	3	58.55	17	85.5	4	22.76	136	93.6	3	62.06	22	48.7	3
26.2	15.28	28	34.8	7	58.39	16	84.7	8	21.44	132	93.2	4	61.86	20	47.9	8
Dec. 6.2	15.05	23	33.7	11	58.26	13	83.5	12	20.19	125	92.3	9	61.67	19	46.7	12
16.1	14.87	18	32.2	15	58.16	10	82.0	15	19.06	113	90.8	15	61.52	15	45.1	16
26.1	14.76	11	30.3	19	58.09	7	80.2	18	18.06	100	88.8	20	61.41	11	43.0	21
36.1	14.71	5	28.1	22	58.05	4	78.2	20	17.25	81	86.3	25	61.33	8	40.6	24
Sec δ, Tan δ	1.929		−1.650		1.130		+0.526		5.896		+5.811		1.322		+0.864	
Mean Place	$10^{s}.556$		31″.82		$56^{s}.225$		61″.69		$28^{s}.984$		63″.12		$60^{s}.218$		21″.60	
$D'_{\psi} a$, $D_{\omega} a$	+0.03		+0.07		−0.01		−0.02		−0.11		−0.26		−0.02		−0.04	
″, $D_{\omega} \delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**α Octantis.** Mag. 5.2 Right Ascension.		**α Octantis.** Mag. 5.2 Declination S.		**γ Microscopii.** Mag. 4.7 Right Ascension.		**γ Microscopii.** Mag. 4.7 Declination S.		**θ Capricorni.** Mag. 4.2 Right Ascension.		**θ Capricorni.** Mag. 4.2 Declination S.		**ξ Cygni.** Mag. 3.9 Right Ascension.		**ξ Cygni.** Mag. 3.9 Declination N.	
	h m 20 54 s		° ′ −77 20 ″		h m 20 56 s		° ′ −32 35 ″		h m 21 1 s		° ′ −17 34 ″		h m 21 1 s		° ′ +43 35 ″	
Jan. 1.1	25.36		72.6		4.45		36.6		9.82		24.5		48.86		22.7	
11.1	25.19	17	69.5	31	4.47	2	35.7	9	9.84	2	24.4	1	48.79	7	20.2	25
21.0	25.20	1	66.2	33	4.53	6	34.6	11	9.89	5	24.2	2	48.77	2	17.5	27
31.0	25.37	17	62.8	34	4.63	10	33.4	12	9.97	8	23.9	3	48.79	2	14.7	28
Feb. 10.0	25.71	34	59.4	34	4.76	13	32.1	13	10.09	12	23.5	4	48.87	8	11.9	28
20.0	26.21	50	56.0	34	4.93	17	30.7	14	10.24	15	23.0	5	48.99	12	9.3	26
Mar. 1.9	26.85	64	52.7	33	5.14	21	29.1	16	10.41	17	22.3	7	49.16	17	6.9	24
11.9	27.62	77	49.6	31	5.37	23	27.5	16	10.62	21	21.4	9	49.38	22	4.8	21
21.9	28.50	88	46.8	28	5.64	27	25.9	16	10.85	23	20.4	10	49.64	26	3.2	16
31.8	29.48	98	44.3	25	5.94	30	24.2	17	11.11	26	19.2	12	49.94	30	2.1	11
Apr. 10.8	30.54	106	42.2	21	6.25	31	22.6	16	11.40	29	17.9	13	50.27	33	1.6	5
20.8	31.66	112	40.4	18	6.59	34	21.0	16	11.70	30	16.5	14	50.63	36	1.6	0
30.8	32.82	116	39.1	13	6.95	36	19.4	16	12.02	32	14.9	16	51.00	37	2.2	6
May 10.7	33.99	117	38.3	8	7.31	36	18.0	14	12.34	32	13.4	15	51.37	37	3.4	12
20.7	35.16	117	37.9	4	7.68	37	16.7	13	12.67	33	11.8	16	51.75	38	5.1	17
30.7	36.30	114	38.0	1	8.04	36	15.5	12	13.00	33	10.3	15	52.12	37	7.2	21
June 9.7	37.38	108	38.6	6	8.39	35	14.6	9	13.32	32	8.9	14	52.46	34	9.7	25
19.6	38.37	99	39.6	10	8.71	32	14.0	6	13.62	30	7.6	13	52.78	32	12.6	29
29.6	39.26	89	41.1	15	9.01	30	13.6	4	13.89	27	6.4	12	53.06	28	15.7	31
July 9.6	40.01	75	43.0	19	9.27	26	13.4	2	14.13	24	5.5	9	53.29	23	19.0	33
19.5	40.62	61	45.2	22	9.49	22	13.5	1	14.33	20	4.7	8	53.47	18	22.4	34
29.5	41.06	44	47.6	24	9.67	18	13.8	3	14.49	16	4.1	6	53.60	13	25.8	34
Aug. 8.5	41.32	26	50.2	26	9.79	12	14.4	6	14.60	11	3.8	3	53.67	7	29.1	33
18.5	41.39	7	52.9	27	9.85	6	15.1	7	14.67	7	3.7	1	53.69	2	32.3	32
28.4	41.27	12	55.6	27	9.87	2	16.0	9	14.69	2	3.7	0	53.65	4	35.4	31
Sept. 7.4	40.98	29	58.2	26	9.83	4	16.9	9	14.66	3	3.9	2	53.56	9	38.1	27
17.4	40.51	47	60.6	24	9.75	8	17.9	10	14.60	6	4.2	3	53.43	13	40.5	24
27.4	39.90	61	62.7	21	9.63	12	18.9	10	14.50	10	4.6	4	53.26	17	42.6	21
Oct. 7.3	39.17	73	64.3	16	9.48	15	19.8	9	14.37	13	5.1	5	53.05	21	44.3	17
17.3	38.35	82	65.5	12	9.31	17	20.6	8	14.23	14	5.5	4	52.83	22	45.6	13
27.3	37.47	88	66.2	7	9.13	18	21.2	6	14.08	15	6.0	5	52.59	24	46.4	8
Nov. 6.2	36.58	89	66.3	1	8.96	17	21.6	4	13.93	15	6.5	5	52.34	25	46.7	3
16.2	35.72	86	65.8	5	8.79	17	21.9	3	13.79	14	6.9	4	52.11	23	46.5	2
26.2	34.92	80	64.7	11	8.65	14	21.9	0	13.67	12	7.2	3	51.89	22	45.9	6
Dec. 6.2	34.21	71	63.0	17	8.53	12	21.6	3	13.57	10	7.4	2	51.69	20	44.7	12
16.1	33.62	59	60.9	21	8.45	8	21.2	4	13.51	6	7.6	2	51.52	17	43.1	16
26.1	33.18	44	58.4	25	8.41	4	20.6	6	13.47	4	7.7	1	51.38	14	41.1	20
36.1	32.90	28	55.5	29	8.40	1	19.7	9	13.46	1	7.7	0	51.29	9	38.7	24
Sec δ, Tan δ	4.566		−4.455		1.187		−0.639		1.049		−0.317		1.381		+0.952	
Mean Place	$27^s.658$		58″.34		$4^s.887$		26″.42		$10^s.251$		16″.91		$50^s.312$		18″.07	
$D'_\psi a$, $D_\omega a$	+0.09		+0.20		+0.01		+0.03		+0.01		+0.02		−0.02		−0.05	
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	61 Cygni *pr.* Mag. 5.6				ν Aquarii. Mag. 4.5				Bradley 2777. Mag. 5.9				3 Piscis Australis. Mag. 5.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 3		+38 19		21 4		−11 42		21 7		+77 46		21 8		−27 57	
	s		″		s		″		s		″		s		″	
Jan. 1.1	3.83		54.5		57.46		65.3		6.52		64.3		14.70		69.5	
11.1	3.79	4	52.1	24	57.48	2	65.6	3	5.93	59	61.7	26	14.71	1	68.8	7
21.0	3.80	1	49.6	25	57.52	4	65.8	2	5.52	41	58.7	30	14.75	4	68.0	8
31.0	3.85	5	47.1	25	57.60	8	65.8	0	5.28	24	55.5	32	14.83	8	67.1	9
Feb. 10.0	3.94	9	44.6	25	57.71	11	65.8	0	5.24	4	52.3	32	14.95	12	66.0	11
20.0	4.07	13	42.3	23	57.85	14	65.6	2	5.40	16	49.1	32	15.10	15	64.8	12
Mar. 1.9	4.25	18	40.2	21	58.01	16	65.2	4	5.75	35	46.0	31	15.28	18	63.5	13
11.9	4.48	23	38.4	18	58.21	20	64.6	6	6.28	53	43.2	28	15.50	22	62.0	15
21.9	4.74	26	37.1	13	58.44	23	63.8	8	6.96	68	40.9	23	15.74	24	60.5	15
31.9	5.03	29	36.3	8	58.69	25	62.8	10	7.79	83	39.0	19	16.02	28	58.9	16
Apr. 10.8	5.35	32	36.1	2	58.96	27	61.7	11	8.72	93	37.7	13	16.31	29	57.3	16
20.8	5.70	35	36.4	3	59.25	29	60.4	13	9.73	101	37.0	7	16.63	32	55.6	17
30.8	6.06	36	37.2	8	59.56	31	58.9	15	10.78	105	36.9	1	16.97	34	54.0	16
May 10.7	6.43	37	38.6	14	59.88	32	57.3	16	11.84	106	37.4	5	17.32	35	52.4	16
20.7	6.79	36	40.4	18	60.20	32	55.7	16	12.87	103	38.6	12	17.67	35	50.9	15
30.7	7.15	36	42.7	23	60.52	32	54.0	17	13.84	97	40.3	17	18.02	35	49.6	13
June 9.7	7.49	34	45.4	27	60.83	31	52.4	16	14.73	89	42.5	22	18.36	34	48.5	11
19.6	7.79	30	48.3	29	61.12	29	50.8	16	15.51	78	45.2	27	18.68	32	47.5	10
29.6	8.07	28	51.4	31	61.39	27	49.4	14	16.15	64	48.3	31	18.98	30	46.8	7
July 9.6	8.30	23	54.7	33	61.63	24	48.1	13	16.65	50	51.6	33	19.24	26	46.3	5
19.6	8.48	18	58.1	34	61.83	20	47.0	11	16.99	34	55.2	36	19.47	23	46.1	2
29.5	8.62	14	61.4	33	61.99	16	46.1	9	17.16	17	58.9	37	19.64	17	46.1	0
Aug. 8.5	8.70	8	64.7	33	62.10	11	45.4	7	17.16	0	62.6	37	19.77	13	46.4	3
18.5	8.73	3	67.8	31	62.16	6	44.9	5	17.00	16	66.4	38	19.85	8	46.9	5
28.4	8.71	2	70.7	29	62.18	2	44.6	3	16.67	33	70.0	36	19.87	2	47.5	6
Sept. 7.4	8.65	6	73.3	26	62.16	2	44.5	1	16.18	49	73.4	34	19.85	2	48.2	7
17.4	8.54	11	75.6	23	62.10	6	44.5	0	15.56	62	76.6	32	19.79	6	49.0	8
27.4	8.39	15	77.6	20	62.01	9	44.7	2	14.81	75	79.5	29	19.69	10	49.9	9
Oct. 7.3	8.22	17	79.2	16	61.89	12	44.9	2	13.95	86	81.9	24	19.55	14	50.7	8
17.3	8.02	20	80.3	11	61.75	14	45.2	3	13.01	94	84.0	21	19.40	15	51.5	8
27.3	7.82	20	81.1	8	61.61	14	45.6	4	12.00	101	85.5	15	19.24	16	52.2	7
Nov. 6.3	7.61	21	81.3	2	61.47	14	46.1	5	10.95	105	86.6	11	19.07	17	52.7	5
16.2	7.41	20	81.1	2	61.33	14	46.5	4	9.90	105	87.0	4	18.92	15	53.0	3
26.2	7.23	18	80.5	6	61.21	12	46.9	4	8.86	104	86.9	1	18.78	14	53.2	2
Dec. 6.2	7.07	16	79.4	11	61.12	9	47.3	4	7.87	99	86.1	8	18.67	11	53.2	0
16.1	6.93	14	77.9	15	61.05	7	47.7	4	6.96	91	84.8	13	18.58	9	53.0	2
26.1	6.83	10	76.0	19	61.01	4	48.0	3	6.15	81	82.9	19	18.53	5	52.6	4
36.1	6.77	6	73.8	22	61.00	1	48.3	3	5.48	67	80.6	23	18.52	1	52.0	6
Sec δ, Tan δ	1.275		+0.791		1.021		−0.207		4.726		+4.619		1.132		−0.531	
Mean Place	5s.095		50″.90		57s.907		58″.97		13s.487		54″.83		15s.080		59″.99	
D′ψ α, Dω α	−0.01		−0.04		0.00		+0.01		−0.08		−0.22		+0.01		+0.03	
Dψ δ, Dω δ	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ζ Cygni. Mag. 3.4				τ Cygni. Mag. 3.8				α Equulei. Mag. 4.1				σ Cygni. Mag. 4.3			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 9		+29 52		21 11		+37 40		21 11		+ 4 53		21 14		+39 2	
	s		″		s		″		s		″		s		″	
Jan. 1.1	18.09		42.4		22.65		59.9		33.95		42.5		3.37		21.9	
11.1	18.06	3	40.2	22	22.60	5	57.6	23	33.95	0	41.3	12	3.30	7	19.6	23
21.0	18.06	0	38.0	22	22.58	2	55.1	25	33.98	3	40.2	11	3.28	2	17.1	25
31.0	18.10	4	35.7	23	22.61	3	52.5	26	34.04	6	39.2	10	3.30	2	14.4	27
Feb. 10.0	18.17	7	33.4	23	22.67	6	50.0	25	34.13	9	38.2	10	3.36	6	11.8	26
20.0	18.29	12	31.3	21	22.78	11	47.5	25	34.25	12	37.4	8	3.47	11	9.3	25
Mar. 1.9	18.44	15	29.5	18	22.94	16	45.3	22	34.41	16	36.9	5	3.62	15	7.1	22
11.9	18.63	19	27.9	16	23.14	20	43.5	18	34.59	18	36.6	3	3.82	20	5.2	19
21.9	18.86	23	26.8	11	23.38	24	42.1	14	34.80	21	36.6	0	4.06	24	3.7	15
31.9	19.12	26	26.1	7	23.65	27	41.1	10	35.04	24	36.9	3	4.33	27	2.6	11
Apr. 10.8	19.40	28	25.9	2	23.95	30	40.7	4	35.30	26	37.5	6	4.64	31	2.1	5
20.8	19.71	31	26.3	4	24.28	33	40.8	1	35.58	28	38.5	10	4.97	33	2.2	1
30.8	20.04	33	27.1	8	24.63	35	41.5	7	35.88	30	39.7	12	5.32	35	2.8	6
May 10.7	20.37	33	28.4	13	24.99	36	42.7	12	36.19	31	41.3	16	5.68	36	3.9	11
20.7	20.71	34	30.1	17	25.35	36	44.3	16	36.51	32	43.0	17	6.04	36	5.5	16
30.7	21.04	33	32.2	21	25.70	35	46.4	21	36.82	31	44.9	19	6.40	36	7.6	21
June 9.7	21.36	32	34.6	24	26.03	33	48.9	25	37.12	30	47.0	21	6.74	34	10.1	25
19.6	21.65	29	37.2	26	26.34	31	51.7	28	37.40	28	49.1	21	7.05	31	12.8	27
29.6	21.91	26	40.1	29	26.61	27	54.7	30	37.66	26	51.2	21	7.33	28	15.8	30
July 9.6	22.14	23	43.1	30	26.85	24	57.8	31	37.89	23	53.3	21	7.57	24	19.0	32
19.6	22.33	19	46.0	29	27.04	19	61.1	33	38.08	19	55.3	20	7.77	20	22.2	32
29.5	22.47	14	49.0	30	27.18	14	64.3	32	38.24	16	57.1	18	7.91	14	25.5	33
Aug. 8.5	22.56	9	51.9	29	27.27	9	67.5	32	38.35	11	58.8	17	8.00	9	28.7	32
18.5	22.60	4	54.6	27	27.31	4	70.6	31	38.41	6	60.2	14	8.04	4	31.8	31
28.4	22.60	0	57.1	25	27.30	1	73.4	28	38.43	2	61.5	13	8.03	1	34.7	29
Sept. 7.4	22.55	5	59.4	23	27.24	6	76.0	26	38.41	2	62.5	10	7.97	6	37.4	27
17.4	22.46	9	61.4	20	27.13	11	78.3	23	38.35	6	63.3	8	7.86	11	39.8	24
27.4	22.34	12	63.0	16	26.99	14	80.3	20	38.26	9	63.9	6	7.72	14	41.8	20
Oct. 7.3	22.19	15	64.3	13	26.82	17	81.9	16	38.14	12	64.3	4	7.55	17	43.4	16
17.3	22.02	17	65.3	10	26.63	19	83.1	12	38.01	13	64.5	2	7.35	20	44.7	13
27.3	21.84	18	65.8	5	26.43	20	83.9	8	37.87	14	64.4	1	7.14	21	45.5	8
Nov. 6.3	21.66	18	66.0	2	26.22	21	84.2	3	37.73	14	64.2	2	6.93	21	45.9	4
16.2	21.48	18	65.7	3	26.01	21	84.1	1	37.59	14	63.8	4	6.72	21	45.8	1
26.2	21.32	16	65.0	7	25.82	19	83.5	6	37.47	12	63.2	6	6.52	20	45.2	6
Dec. 6.2	21.17	15	64.0	10	25.65	17	82.4	11	37.37	10	62.4	8	6.34	18	44.2	10
16.1	21.05	12	62.6	14	25.50	15	81.0	14	37.29	8	61.5	9	6.19	15	42.7	15
26.1	20.96	9	60.9	17	25.38	12	79.1	19	37.24	5	60.5	10	6.06	13	40.9	18
36.1	20.90	6	58.9	20	25.30	8	77.0	21	37.22	2	59.4	11	5.98	8	38.7	22
Sec δ, Tan δ	1.153		+0.575		1.264		+0.772		1.004		+0.086		1.288		+0.811	
Mean Place	$19^{s}.072$		39″.67		$23^{s}.848$		55″.52		$34^{s}.507$		45″.02		$4^{s}.592$		17″.08	
$D'_{\phi}\alpha$, $D_{\omega}\alpha$	−0.01		−0.03		−0.01		−0.04		0.00		0.00		−0.01		−0.04	
$D_{\phi}\delta$, $D_{\omega}\delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.7	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ¹ Microscopii. Mag. 4.9				α Cephei. Mag. 2.6				ι Capricorni. Mag. 4.3				1 Pegasi. Mag. 4.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m 21 15		° ′ −41 9		h m 21 16		° ′ +62 13		h m 21 17		° ′ −17 11		h m 21 18		° ′ +19 26	
	s		″		s		″		s		″		s		″	
Jan. 1.1	19.22		81.9		30.46		39.3		30.60		57.0		8.58		26.1	
11.1	19.22	0	80.6	13	30.25	21	36.7	26	30.60	0	57.0	0	8.56	2	24.4	
21.1	19.25	3	79.0	16	30.11	14	33.8	29	30.63	3	56.8	2	8.57	1	22.6	
31.0	19.33	8	77.3	17	30.06	5	30.7	31	30.70	7	56.5	3	8.61	4	20.8	
Feb. 10.0	19.45	12	75.4	19	30.08	2	27.5	32	30.80	10	56.1	4	8.69	8	19.1	
20.0	19.61	16	73.4	20	30.18	10	24.4	31	30.93	13	55.5	6	8.80	11	17.5	
Mar. 1.9	19.81	20	71.3	21	30.37	19	21.5	29	31.09	16	54.8	7	8.94	14	16.1	
11.9	20.04	23	69.2	21	30.63	26	18.9	26	31.28	19	53.9	9	9.12	18	15.1	
21.9	20.31	27	67.1	21	30.97	34	16.7	22	31.50	22	52.8	11	9.33	21	14.4	
31.9	20.62	31	65.0	21	31.37	40	15.0	17	31.74	24	51.6	12	9.57	24	14.1	
Apr. 10.8	20.95	33	63.0	20	31.83	46	13.8	12	32.02	28	50.2	14	9.83	26	14.2	
20.8	21.31	36	61.1	19	32.33	50	13.3	5	32.31	29	48.7	15	10.12	29	14.7	
30.8	21.69	38	59.4	17	32.85	52	13.4	1	32.62	31	47.1	16	10.43	31	15.7	
May 10.8	22.09	40	57.8	16	33.39	54	14.1	7	32.95	33	45.4	17	10.75	32	17.1	
20.7	22.49	40	56.4	14	33.92	53	15.4	13	33.28	33	43.8	16	11.07	32	18.9	
30.7	22.89	40	55.4	10	34.43	51	17.2	18	33.61	33	42.2	16	11.39	32	20.9	20
June 9.7	23.28	39	54.6	8	34.91	48	19.6	24	33.93	32	40.6	16	11.70	31	23.2	
19.6	23.65	37	54.1	5	35.34	43	22.3	27	34.23	30	39.2	14	11.99	29	25.6	
29.6	23.99	34	53.9	2	35.72	38	25.5	32	34.52	29	38.0	12	12.25	26	28.2	
July 9.6	24.29	30	54.0	1	36.03	31	28.9	34	34.77	25	36.9	11	12.48	23	30.8	
19.6	24.55	26	54.5	5	36.27	24	32.5	36	34.98	21	36.1	8	12.68	20	33.5	27
29.5	24.75	20	55.2	7	36.44	17	36.2	37	35.15	17	35.4	7	12.83	15	36.0	25
Aug. 8.5	24.91	16	56.2	10	36.52	8	39.9	37	35.28	13	35.0	4	12.94	11	38.4	24
18.5	25.00	9	57.4	12	36.51	1	43.6	37	35.36	8	34.8	2	13.00	6	40.7	23
28.5	25.03	3	58.7	13	36.43	8	47.1	35	35.40	4	34.8	0	13.02	2	42.8	21
Sept. 7.4	25.01	2	60.1	14	36.28	15	50.4	33	35.39	1	35.0	2	12.99	3	44.6	18
17.4	24.93	8	61.5	14	36.05	23	53.5	31	35.34	5	35.3	3	12.93	6	46.1	15
27.4	24.81	12	62.9	14	35.77	28	56.2	27	35.25	9	35.7	4	12.83	10	47.4	13
Oct. 7.3	24.65	16	64.2	13	35.43	34	58.5	23	35.14	11	36.2	5	12.70	13	48.4	10
17.3	24.47	18	65.3	11	35.06	37	60.4	19	35.00	14	36.7	5	12.56	14	49.0	6
27.3	24.27	20	66.1	8	34.66	40	61.8	14	34.86	14	37.2	5	12.41	15	49.4	4
Nov. 6.3	24.07	20	66.7	6	34.24	42	62.7	9	34.71	15	37.7	5	12.25	16	49.4	0
16.2	23.87	20	67.0	3	33.82	42	63.0	3	34.57	14	38.2	5	12.10	15	49.1	3
26.2	23.69	18	67.0	0	33.41	41	62.7	3	34.45	12	38.6	4	11.96	14	48.5	6
Dec. 6.2	23.54	15	66.6	4	33.02	39	61.9	8	34.35	10	38.9	3	11.84	12	47.6	0
16.2	23.42	12	65.9	7	32.67	35	60.5	14	34.27	8	39.1	2	11.74	10	46.4	12
26.1	23.35	7	65.0	9	32.37	30	58.6	19	34.22	5	39.2	1	11.67	7	45.0	14
36.1	23.31	4	63.8	12	32.12	25	56.2	24	34.20	2	39.2	0	11.62	5	43.4	16
Sec δ, Tan δ	1.328		−0.874		2.146		+1.899		1.047		−0.310		1.060		+0.353	
Mean Place	$19^{\mathrm{s}}.599$		70″.24		$33^{\mathrm{s}}.153$		30″.51		$30^{\mathrm{s}}.963$		49″.76		$9^{\mathrm{s}}.316$		25″.06	
$D'_\psi\alpha$, $D_\omega\alpha$	+0.02		+0.04		−0.03		−0.10		+0.01		+0.02		−0.01		−0.02	
$D_\psi\delta$, $D_\omega\delta$	+0.3		−0.7		+0.3		−0.7		+0.3		−0.7		+0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**γ Pavonis.** Mag. 4.3				**ζ Capricorni.** Mag. 3.9				**g Cygni.** Mag. 5.3				**β Aquarii.** Mag. 3.1			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 21 19		° ′ −65 44		h m 21 21		° ′ −22 46		h m 21 26		° ′ +46 9		h m 21 27		° ′ − 5 56	
	s		″		s		″		s		″		s		″	
n. 1.1	25.08	10	81.1	26	48.70	0	56.8	4	17.26	10	62.7	24	4.73	1	49.1	6
11.1	24.98	1	78.5	28	48.70	3	56.4	5	17.16	6	60.3	26	4.72	2	49.7	5
21.1	24.97	7	75.7	30	48.73	6	55.9	6	17.10	1	57.7	28	4.74	5	50.2	3
31.0	25.04	15	72.7	31	48.79	10	55.3	8	17.09	4	54.9	28	4.79	9	50.5	3
eb. 10.0	25.19	23	69.6	32	48.89	13	54.5	9	17.13	9	52.1	27	4.88	11	50.8	1
20.0	25.42	31	66.4	32	49.02	16	53.6	11	17.22	14	49.4	26	4.99	14	50.9	1
ar. 1.9	25.73	38	63.2	30	49.18	19	52.5	12	17.36	20	46.8	22	5.13	17	50.8	3
11.9	26.11	45	60.2	30	49.37	23	51.3	14	17.56	24	44.6	18	5.30	20	50.5	6
21.9	26.56	50	57.2	27	49.60	25	49.9	15	17.80	29	42.8	14	5.50	23	49.9	8
31.9	27.06	56	54.5	24	49.85	28	48.4	16	18.09	32	41.4	8	5.73	26	49.1	10
pr. 10.8	27.62	60	52.1	22	50.13	30	46.8	16	18.41	36	40.6	2	5.99	28	48.1	13
20.8	28.22	63	49.9	18	50.43	32	45.2	17	18.77	38	40.4	3	6.27	30	46.8	14
30.8	28.85	65	48.1	14	50.75	33	43.5	17	19.15	39	40.7	9	6.57	31	45.4	17
ay 10.8	29.50	66	46.7	10	51.08	34	41.8	16	19.54	39	41.6	15	6.88	32	43.7	17
20.7	30.16	66	45.7	5	51.42	34	40.2	16	19.93	39	43.1	19	7.20	32	42.0	18
30.7	30.82	64	45.2	1	51.76	33	38.6	14	20.32	38	45.0	24	7.52	31	40.2	19
une 9.7	31.46	60	45.1	3	52.09	32	37.2	12	20.70	34	47.4	27	7.83	29	38.3	18
19.6	32.06	55	45.4	7	52.41	29	36.0	10	21.04	31	50.1	30	8.12	28	36.5	17
29.6	32.61	49	46.1	12	52.70	26	35.0	8	21.35	27	53.1	33	8.40	24	34.8	16
uly 9.6	33.10	41	47.3	16	52.96	23	34.2	6	21.62	21	56.4	34	8.64	21	33.2	15
19.6	33.51	33	48.9	18	53.19	18	33.6	3	21.83	17	59.8	34	8.85	17	31.7	13
29.5	33.84	22	50.7	21	53.37	14	33.3	1	22.00	10	63.2	35	9.02	13	30.4	11
ug. 8.5	34.06	13	52.8	23	53.51	9	33.2	1	22.10	5	66.7	33	9.15	9	29.3	9
18.5	34.19	2	55.1	24	53.60	4	33.3	3	22.15	1	70.0	32	9.24	4	28.4	7
28.5	34.21	8	57.5	24	53.64	1	33.6	5	22.14	6	73.2	30	9.28	0	27.7	4
ept. 7.4	34.13	17	59.9	22	53.63	5	34.1	6	22.08	11	76.2	27	9.28	4	27.3	3
17.4	33.96	26	62.1	21	53.58	8	34.7	7	21.97	16	78.9	24	9.24	8	27.0	1
27.4	33.70	33	64.2	18	53.50	12	35.4	7	21.81	19	81.3	19	9.16	10	26.9	0
ct. 7.3	33.37	38	66.0	14	53.38	14	36.1	7	21.62	22	83.2	16	9.06	12	26.9	2
17.3	32.99	42	67.4	10	53.24	15	36.8	6	21.40	23	84.8	12	8.94	14	27.1	3
27.3	32.57	43	68.4	5	53.09	15	37.4	6	21.17	25	86.0	6	8.80	14	27.4	4
ov. 6.3	32.14	43	68.9	0	52.94	15	38.0	4	20.92	24	86.6	2	8.66	13	27.8	5
16.2	31.71	41	68.9	5	52.79	13	38.4	3	20.68	24	86.8	4	8.53	12	28.3	5
26.2	31.30	36	68.4	11	52.66	11	38.7	2	20.44	22	86.4	9	8.41	10	28.8	5
Dec. 6.2	30.94	30	67.3	15	52.55	9	38.9	0	20.22	20	85.5	13	8.31	8	29.3	6
16.2	30.64	23	65.8	20	52.46	5	38.9	1	20.02	16	84.2	18	8.23	6	29.9	5
26.1	30.41	16	63.8	24	52.41	3	38.8	2	19.86	13	82.4	22	8.17	3	30.4	6
36.1	30.25		61.4		52.38		38.6		19.73		80.2		8.14		31.0	
c δ, Tan δ	2.435		−2.220		1.085		−0.420		1.444		+1.042		+1.005		−0.104	
ean Place	25ˢ.871		66″.49		49ˢ.032		48″.36		18ˢ.716		55″.50		5ˢ.123		44″.59	
$_\psi\alpha$, $D_\psi\alpha$	+0.04		+0.11		+0.01		+0.02		−0.02		−0.05		0.00		+0.01	
$_\psi\delta$, $D_\psi\delta$	+0.3		−0.6		+0.3		−0.6		+0.3		−0.6		+0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Cephei. Mag. 3.3				ξ Aquarii. Mag. 4.8				74 Cygni. Mag. 5.1				γ Capricorni Mag. 3.8		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Dec tio
	h m		° ′		h m		° ′		h m		° ′		h m		
	21 27		+70 10		21 33		− 8 13		21 33		+40 1		21 35		−1
	s		″		s		″		s		″		s		
Jan. 1.1	30.27	36	85.5	25	13.34	1	74.3	4	31.31	8	58.8	22	22.73	1	55
11.1	29.91	26	83.0	29	13.33	2	74.7	4	31.23	5	56.6	24	22.72	1	55
21.1	29.65	15	80.1	31	13.35	5	75.1	2	31.18	0	54.2	26	22.73	5	55
31.0	29.50	4	77.0	32	13.40	7	75.3	1	31.18	3	51.6	26	22.78	8	54
Feb. 10.0	29.46	8	73.8	32	13.47	11	75.4	1	31.21	9	49.0	25	22.86	11	54
20.0	29.54	19	70.6	31	13.58	14	75.3	2	31.30	13	46.5	23	22.97	14	53
Mar. 2.0	29.73	31	67.5	28	13.72	17	75.1	5	31.43	18	44.2	20	23.11	18	52
11.9	30.04	41	64.7	24	13.89	19	74.6	7	31.61	22	42.2	16	23.29	20	51
21.9	30.45	51	62.3	19	14.08	23	73.9	9	31.83	25	40.6	12	23.49	23	50
31.9	30.96	58	60.4	14	14.31	25	73.0	11	32.08	30	39.4	7	23.72	26	49
Apr. 10.8	31.54	64	59.0	9	14.56	28	71.9	13	32.38	33	38.7	1	23.98	29	48
20.8	32.18	68	58.1	2	14.84	30	70.6	15	32.71	35	38.6	4	24.27	30	46
30.8	32.86	70	57.9	4	15.14	31	69.1	17	33.06	36	39.0	10	24.57	32	44
May 10.8	33.56	69	58.3	11	15.45	32	67.4	18	33.42	37	40.0	14	24.89	33	43
20.7	34.25	67	59.4	16	15.77	32	65.6	18	33.79	37	41.4	19	25.22	33	41
30.7	34.92	63	61.0	21	16.09	32	63.8	18	34.16	35	43.3	24	25.55	33	39
June 9.7	35.55	57	63.1	26	16.41	30	62.0	17	34.51	33	45.7	26	25.88	31	37
19.7	36.12	50	65.7	30	16.71	28	60.3	17	34.84	30	48.3	29	26.19	30	36
29.6	36.62	41	68.7	33	16.99	25	58.6	15	35.14	26	51.2	32	26.49	26	35
July 9.6	37.03	32	72.0	36	17.24	22	57.1	14	35.40	22	54.4	32	26.75	23	33
19.6	37.35	21	75.6	37	17.46	18	55.7	12	35.62	17	57.6	33	26.98	19	33
29.5	37.56	10	79.3	38	17.64	13	54.5	10	35.79	12	60.9	33	27.17	14	32
Aug. 8.5	37.66	1	83.1	37	17.77	9	53.5	7	35.91	6	64.2	31	27.31	10	31
18.5	37.65	11	86.8	37	17.86	5	52.8	6	35.97	2	67.3	30	27.41	5	31
28.5	37.54	21	90.5	35	17.91	1	52.2	3	35.99	4	70.3	28	27.46	1	31
Sept. 7.4	37.33	31	94.0	33	17.92	4	51.9	2	35.95	9	73.1	25	27.47	3	31.
17.4	37.02	39	97.3	30	17.88	7	51.7	0	35.86	12	75.6	22	27.44	8	32.0
27.4	36.63	46	100.3	26	17.81	10	51.7	2	35.74	16	77.8	19	27.36	10	32.5
Oct. 7.4	36.17	52	102.9	22	17.71	12	51.9	3	35.58	18	79.7	15	27.26	12	33.0
17.3	35.65	57	105.1	17	17.59	13	52.2	3	35.40	20	81.2	10	27.14	14	33.6
27.3	35.08	59	106.8	12	17.46	13	52.5	4	35.20	21	82.2	6	27.00	14	34.2
Nov. 6.3	34.49	61	108.0	6	17.33	13	52.9	5	34.99	21	82.8	1	26.86	14	34.7
16.2	33.88	61	108.6	0	17.20	13	53.4	5	34.78	20	82.9	4	26.72	12	35.2
26.2	33.27	57	108.6	6	17.07	10	53.9	5	34.58	19	82.5	8	26.60	11	35.7
Dec. 6.2	32.70	54	108.0	11	16.97	8	54.4	5	34.39	17	81.7	13	26.49	9	36.0
16.2	32.16	49	106.9	17	16.89	6	54.9	5	34.22	14	80.4	17	26.40	6	36.3
26.1	31.67	41	105.2	23	16.83	3	55.4	5	34.08	10	78.7	20	26.34	3	36.4
36.1	31.26		102.9		16.80		55.9		33.98		76.7		26.31		36.5
Sec δ, Tan δ	2.951		+2.776		1.010		−0.145		1.306		+0.840		1.046		−0.30
Mean Place	34ˢ.161		74″.66		13ˢ.698		69″.39		32ˢ.484		52″.30		23ˢ.022		48″.24
D′ψ α, Dω α	−0.05		−0.15		0.00		+0.01		−0.01		−0.04		0.00		+0.0
Dψ δ, Dω δ	+0.3		−0.6		+0.3		−0.6		+0.3		−0.6		+0.3		−0.6

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	λ Octantis. Mag. 5.4				ε Pegasi. Mag. 2.5				11 Cephei. Mag. 4.8				δ Capricorni. Mag. 3.0			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 37		−83 6		21 40		+ 9 28		21 40		+70 54		21 42		−16 30	
	s		″		s		″		s		″		s		″	
an. 1.1	57.49		55.4		0.17		64.9		36.93		83.6		20.81		55.5	
11.1	56.74	75	52.4	30	0.14	3	63.7	12	36.53	40	81.2	24	20.79	2	55.5	0
21.1	56.28	46	49.0	34	0.14	0	62.4	13	36.22	31	78.5	27	20.80	1	55.3	2
31.0	56.13	15	45.4	36	0.17	3	61.2	12	36.02	20	75.5	30	20.84	4	55.1	2
eb. 10.0	56.28	15	41.7	37	0.23	6	60.1	11	35.94	8	72.3	32	20.91	7	54.7	4
20.0	56.72	44	38.0	37	0.32	9	59.0	11	35.98	4	69.1	32	21.01	10	54.1	6
ar. 2.0	57.45	73	34.3	37	0.44	12	58.2	8	36.15	17	66.0	31	21.15	14	53.3	8
11.9	58.44	99	30.8	35	0.60	16	57.7	5	36.43	28	63.1	29	21.31	16	52.3	10
21.9	59.67	123	27.4	34	0.78	18	57.5	2	36.83	40	60.6	25	21.51	20	51.2	11
31.9	61.12	145	24.3	31	1.00	22	57.6	1	37.32	49	58.5	21	21.74	23	49.9	13
pr. 10.9	62.75	163	21.6	27	1.25	25	58.0	4	37.90	58	56.9	16	21.99	25	48.5	14
20.8	64.53	178	19.3	23	1.52	27	58.8	8	38.55	65	56.0	9	22.27	28	46.9	16
30.8	66.42	189	17.4	19	1.81	29	60.0	12	39.25	70	55.6	4	22.57	30	45.2	17
ay 10.8	68.39	197	16.0	14	2.12	31	61.4	14	39.97	72	55.8	2	22.89	32	43.4	18
20.7	70.39	200	15.1	9	2.44	32	63.1	17	40.69	72	56.7	9	23.22	33	41.7	17
30.7	72.39	200	14.7	4	2.75	31	65.1	20	41.39	70	58.1	14	23.55	33	39.9	18
une 9.7	74.34	195	14.8	1	3.06	31	67.2	21	42.06	67	60.1	20	23.88	33	38.2	17
19.7	76.18	184	15.5	7	3.36	30	69.4	22	42.68	62	62.6	25	24.19	31	36.7	15
29.6	77.87	169	16.6	11	3.64	28	71.7	23	43.22	54	65.5	29	24.49	30	35.3	14
uly 9.6	79.38	151	18.2	16	3.89	25	74.0	23	43.67	45	68.7	32	24.76	27	34.1	12
19.6	80.65	127	20.2	20	4.10	21	76.2	22	44.03	36	72.2	35	24.99	23	33.1	10
29.6	81.65	100	22.5	23	4.28	18	78.3	21	44.29	26	75.8	36	25.18	19	32.4	7
ug. 8.5	82.35	70	25.1	26	4.41	13	80.3	20	44.43	14	79.6	38	25.33	15	31.9	5
18.5	82.72	37	27.9	28	4.50	9	82.1	18	44.47	4	83.4	38	25.44	11	31.6	3
28.5	82.76	4	30.8	29	4.55	5	83.7	16	44.39	8	87.2	38	25.50	6	31.5	1
ept. 7.4	82.47	29	33.6	28	4.55	0	85.0	13	44.21	18	90.8	36	25.52	2	31.7	2
17.4	81.85	62	36.3	27	4.51	4	86.1	11	43.93	28	94.2	34	25.49	3	32.0	3
27.4	80.93	92	38.8	25	4.44	7	87.0	9	43.56	37	97.3	31	25.42	7	32.4	4
Oct. 7.4	79.74	119	40.9	21	4.34	10	87.6	6	43.11	45	100.0	27	25.33	9	32.9	5
17.3	78.34	140	42.6	17	4.23	11	88.0	4	42.60	51	102.4	24	25.21	12	33.5	6
27.3	76.77	157	43.8	12	4.10	13	88.2	2	42.03	57	104.3	19	25.07	14	34.1	6
Nov. 6.3	75.10	167	44.4	6	3.96	14	88.1	1	41.43	60	105.7	14	24.93	14	34.7	6
16.3	73.40	170	44.4	0	3.82	14	87.8	3	40.81	62	106.5	8	24.80	13	35.3	6
26.2	71.74	166	43.7	7	3.70	12	87.2	6	40.19	62	106.7	2	24.67	13	35.7	4
Dec. 6.2	70.18	156	42.5	12	3.59	11	86.5	7	39.58	61	106.3	4	24.56	11	36.1	4
16.2	68.78	140	40.6	19	3.49	10	85.6	9	39.01	57	105.4	9	24.47	9	36.4	3
26.1	67.59	119	38.3	23	3.42	7	84.6	10	38.49	52	103.8	16	24.40	7	36.6	2
36.1	66.65	94	35.5	28	3.37	5	83.4	12	38.04	45	101.8	20	24.37	3	36.7	1
ec δ, Tan δ	8.336		−8.275		1.014		+0.167		3.059		+2.891		1.043		−0.297	
ean Place	60ˢ.495		39″.62		0ˢ.661		65″.14		40ˢ.840		71″.41		21ˢ.070		48″.75	
$\psi \alpha$, $D_{\omega} \alpha$	+0.13		+0.45		0.00		−0.01		−0.04		−0.16		0.00		+0.02	
$\psi \delta$, $D_{\omega} \delta$	+0.3		−0.6		+0.3		−0.6		+0.3		−0.6		+0.3		−0.6	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	π² Cygni. Mag. 4.3				μ Capricorni. Mag. 5.2				γ Gruis. Mag. 3.2				16 Pegasi. Mag. 5.0		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Decli tion
	h m 21 43 s		° ′ +48 54 ″		h m 21 48 s		° ′ −13 56 ″		h m 21 48 s		° ′ −37 45 ″		h m 21 49 s		° +25 ″
Jan. 1.1	37.62		66.3		39.55		75.1		46.96		66.1		10.91		33.8
11.1	37.49	13	64.1	22	39.52	3	75.2	1	46.92	4	65.1	10	10.85	6	32.0
21.1	37.40	9	61.5	26	39.53	1	75.2	0	46.91	1	63.8	13	10.83	2	30.1
31.0	37.36	4	58.7	28	39.56	3	75.1	1	46.94	3	62.2	16	10.83	0	28.1
Feb. 10.0	37.37	1	55.9	28	39.62	6	74.8	3	47.01	7	60.5	17	10.87	4	26.2
20.0	37.43	6	53.1	28	39.72	10	74.3	5	47.12	11	58.6	19	10.95	8	24.4
Mar. 2.0	37.55	12	50.5	26	39.84	12	73.7	6	47.27	15	56.6	20	11.06	11	22.7
11.9	37.73	18	48.1	24	40.00	16	72.9	8	47.46	19	54.5	21	11.21	15	21.3
21.9	37.96	23	46.1	20	40.19	19	71.9	10	47.68	22	52.3	22	11.39	18	20.3
31.9	38.24	28	44.6	15	40.41	22	70.7	12	47.94	26	50.1	22	11.61	22	19.6
Apr. 10.9	38.57	33	43.5	11	40.66	25	69.3	14	48.23	29	47.9	22	11.87	26	19.4
20.8	38.93	36	43.0	5	40.93	27	67.7	16	48.55	32	45.7	22	12.15	28	19.6
30.8	39.32	39	43.1	1	41.23	30	66.0	17	48.89	34	43.6	21	12.45	30	20.3
May 10.8	39.72	40	43.8	7	41.54	31	64.3	17	49.26	37	41.7	19	12.78	33	21.4
20.7	40.13	41	45.0	12	41.86	32	62.5	18	49.64	38	40.0	17	13.11	33	23.0
30.7	40.54	41	46.8	18	42.19	33	60.7	18	50.03	39	38.5	15	13.44	33	24.9
June 9.7	40.94	40	49.0	22	42.52	33	58.9	18	50.41	38	37.3	12	13.77	33	27.1
19.7	41.31	37	51.6	26	42.83	31	57.2	17	50.78	37	36.4	9	14.08	31	29.6
29.6	41.65	34	54.6	30	43.13	30	55.7	15	51.13	35	35.8	6	14.37	29	32.2
July 9.6	41.94	29	57.8	32	43.39	26	54.4	13	51.44	31	35.5	3	14.63	26	35.0
19.6	42.19	25	61.1	33	43.63	24	53.2	12	51.72	28	35.6	1	14.85	22	37.8
29.6	42.38	19	64.6	35	43.83	20	52.3	9	51.95	23	36.0	4	15.04	19	40.6
Aug. 8.5	42.51	13	68.1	35	43.98	15	51.6	7	52.14	19	36.7	7	15.18	14	43.3
18.5	42.58	7	71.6	35	44.10	12	51.2	4	52.27	13	37.6	9	15.27	9	46.0
28.5	42.59	1	74.9	33	44.16	6	51.0	2	52.34	7	38.7	11	15.31	4	48.4
Sept. 7.4	42.55	4	78.0	31	44.18	2	51.0	0	52.36	2	40.0	13	15.32	1	50.6
17.4	42.45	10	80.9	29	44.16	2	51.1	1	52.32	4	41.4	14	15.27	5	52.6
27.4	42.31	14	83.5	26	44.10	6	51.4	3	52.24	8	42.8	14	15.20	7	54.3
Oct. 7.4	42.13	18	85.8	23	44.01	9	51.8	4	52.12	12	44.2	14	15.09	11	55.6
17.3	41.91	22	87.6	18	43.90	11	52.3	5	51.96	16	45.4	12	14.96	13	56.7
27.3	41.67	24	89.0	14	43.77	13	52.9	6	51.79	17	46.5	11	14.81	15	57.4
Nov. 6.3	41.42	25	89.9	9	43.63	14	53.4	5	51.61	18	47.4	9	14.65	16	57.7
16.3	41.16	26	90.3	4	43.50	13	54.0	6	51.43	18	48.0	6	14.50	15	57.7
26.2	40.91	25	90.1	2	43.37	13	54.5	5	51.26	17	48.3	3	14.35	15	57.3
Dec. 6.2	40.67	24	89.5	6	43.26	11	54.9	4	51.10	16	48.3	0	14.21	14	56.6
16.2	40.45	22	88.3	12	43.17	9	55.3	4	50.97	13	48.0	3	14.08	13	55.5
26.1	40.26	19	86.7	16	43.10	7	55.6	3	50.87	10	47.3	7	13.98	10	54.1
36.1	40.10	16	84.6	21	43.06	4	55.8	2	50.81	6	46.4	9	13.90	8	52.5
Sec δ, Tan δ	1.522		+1.147		1.030		−0.248		1.265		−0.775		1.108		+0.478
Mean Place	39ˢ.110		57″.23		39ˢ.795		69″.12		47ˢ.133		54″.84		11ˢ.625		29″.46
$D'_\psi a$, $D_\omega a$	−0.02		−0.06		0.00		+0.01		+0.01		+0.04		−0.01		−0.03
$D'_\psi \delta$, $D_\omega \delta$	+0.3		−0.6		+0.3		−0.5		+0.3		−0.5		+0.3		−0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	79 Draconis. Mag. 6.6				ε Indi. Mag. 4.7				20 Pegasi. Mag. 5.7				α Aquarii. Mag. 3.2			
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	21 51		+73 17		21 56		−57 7		21 56		+12 42		22 1		− 0 43	
	s		″		s		″		s		″		s		″	
an. 1.1	43.42		73.4		51.67		83.4		56.41		45.6		24.84		61.6	
11.1	42.92	50	71.2	22	51.57	10	81.5	19	56.37	4	44.3	13	24.80	4	62.3	7
21.1	42.53	39	68.6	26	51.52	5	79.3	22	56.35	2	43.0	13	24.79	1	63.0	7
31.1	42.26	27	65.6	30	51.53	1	76.8	25	56.36	1	41.6	14	24.81	2	63.6	6
Feb. 10.0	42.12	14	62.5	31	51.60	7	74.1	27	56.40	4	40.3	13	24.85	4	64.1	5
20.0	42.11	1	59.3	32	51.73	13	71.3	28	56.47	7	39.2	11	24.93	8	64.5	4
Mar. 2.0	42.25	14	56.2	31	51.92	19	68.4	29	56.58	11	38.2	10	25.03	10	64.6	1
11.9	42.53	28	53.2	30	52.16	24	65.5	29	56.72	14	37.5	7	25.17	14	64.5	1
21.9	42.94	41	50.6	26	52.46	30	62.6	29	56.89	17	37.1	4	25.34	17	64.2	3
31.9	43.47	53	48.4	22	52.81	35	59.8	28	57.10	21	37.0	1	25.54	20	63.6	6
Apr. 10.9	44.10	63	46.7	17	53.20	39	57.1	27	57.33	23	37.3	3	25.77	23	62.8	8
20.8	44.81	71	45.5	12	53.64	44	54.7	24	57.60	27	38.0	7	26.03	26	61.6	12
30.8	45.58	77	44.9	6	54.12	48	52.5	22	57.88	28	39.0	10	26.31	28	60.2	14
May 10.8	46.38	80	44.9	0	54.62	50	50.6	19	58.19	31	40.4	14	26.61	30	58.6	16
20.8	47.19	81	45.6	7	55.14	52	49.0	16	58.51	32	42.0	16	26.93	32	56.8	18
30.7	47.99	80	46.9	13	55.67	53	47.9	11	58.83	32	43.9	19	27.25	32	54.9	19
June 9.7	48.75	76	48.7	18	56.20	53	47.2	7	59.14	31	46.0	21	27.56	31	52.9	20
19.7	49.46	71	51.0	23	56.71	51	46.9	3	59.45	31	48.3	23	27.87	31	50.9	20
29.6	50.08	62	53.8	28	57.19	48	47.0	1	59.74	29	50.7	24	28.16	29	48.9	20
July 9.6	50.61	53	56.9	31	57.64	45	47.5	5	60.00	26	53.1	24	28.42	26	47.0	19
19.6	51.04	43	60.3	34	58.03	39	48.5	10	60.23	23	55.4	23	28.66	24	45.2	18
29.6	51.35	31	63.9	36	58.36	33	49.8	13	60.42	19	57.7	23	28.85	19	43.5	17
Aug. 8.5	51.54	19	67.7	38	58.62	26	51.5	17	60.56	14	59.8	21	29.01	16	42.1	14
18.5	51.61	7	71.5	38	58.80	18	53.5	20	60.67	11	61.8	20	29.13	12	40.8	13
28.5	51.55	6	75.3	38	58.91	11	55.6	21	60.73	6	63.6	18	29.20	7	39.8	10
Sept. 7.5	51.38	17	79.0	37	58.93	2	57.9	23	60.75	2	65.2	16	29.22	2	39.0	8
17.4	51.09	29	82.5	35	58.88	5	60.1	22	60.73	2	66.5	13	29.21	1	38.4	6
27.4	50.69	40	85.7	32	58.77	11	62.3	22	60.67	6	67.6	11	29.17	4	38.0	4
Oct. 7.4	50.21	48	88.7	30	58.59	18	64.4	21	60.58	9	68.4	8	29.09	8	37.9	1
17.3	49.65	56	91.2	25	58.36	23	66.2	18	60.47	11	68.9	5	28.99	10	37.9	0
27.3	49.02	63	93.3	21	58.10	26	67.7	15	60.35	12	69.2	3	28.87	12	38.0	1
Nov. 6.3	48.34	68	94.9	16	57.81	29	68.8	11	60.22	13	69.3	1	28.75	12	38.3	3
16.3	47.63	71	95.9	10	57.52	29	69.4	6	60.08	14	69.1	2	28.62	13	38.7	4
26.2	46.92	71	96.3	4	57.24	28	69.6	2	59.95	13	68.6	5	28.50	12	39.2	5
Dec. 6.2	46.21	71	96.2	1	56.98	26	69.3	3	59.84	11	68.0	6	28.39	11	39.8	6
16.2	45.54	67	95.4	8	56.75	23	68.5	8	59.73	11	67.1	9	28.30	9	40.5	7
26.2	44.92	62	94.0	14	56.56	19	67.2	13	59.65	8	66.0	11	28.22	8	41.2	7
36.1	44.37	55	92.1	19	56.42	14	65.6	16	59.59	6	64.8	12	28.17	5	42.0	8
Sec δ, Tan δ	3.481		+3.334		1.843		−1.548		1.025		+0.226		1.000		−0.013	
Mean Place	$47^s.810$		59″.98		$51^s.886$		68″.91		$56^s.871$		44″.19		$25^s.131$		59″.46	
$D'_\psi \alpha$, $D_\omega \alpha$	−0.05		−0.19		+0.02		+0.09		0.00		−0.01		0.00		0.00	
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.5		+0.3		−0.5		+0.3		−0.5		+0.3		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	*ι* Aquarii Mag. 4.4				20 Cephei. Mag. 5.4				*α* Gruis. Mag. 2.2				*ι* Pegasi. Mag. 4.0		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N
	h m 22 1		° ′ −14 16		h m 22 2		° ′ +62 22		h m 22 2		° ′ −47 22		h m 22 3		° +24 5
	s		″		s		″		s		″		s		″
Jan. 1.1	50.69		62.9		23.15		27.1		52.79		37.2		2.56		51.2
11.1	50.66	3	63.0	1	22.88	27	25.0	21	52.71	8	35.7	15	2.50	6	49.5
21.1	50.65	1	63.0	0	22.67	21	22.4	26	52.67	4	33.9	18	2.46	4	47.7
31.1	50.67	2	62.9	1	22.53	14	19.6	28	52.67	0	31.9	20	2.45	1	45.8
Feb. 10.0	50.72	5	62.6	3	22.46	7	16.6	30	52.72	5	29.6	23	2.47	2	44.0
20.0	50.80	8	62.1	5	22.47	1	13.5	31	52.82	10	27.2	24	2.53	6	42.2
Mar. 2.0	50.91	11	61.4	7	22.57	10	10.5	30	52.96	14	24.6	26	2.63	10	40.6
11.9	51.06	15	60.5	9	22.75	18	7.7	28	53.15	19	22.0	26	2.76	13	39.2
21.9	51.23	17	59.4	11	23.01	26	5.2	25	53.38	23	19.3	27	2.94	18	38.1
31.9	51.44	21	58.2	12	23.35	34	3.2	20	53.65	27	16.7	26	3.15	21	37.5
Apr. 10.9	51.67	23	56.7	15	23.75	40	1.6	16	53.96	31	14.1	26	3.39	24	37.2
20.8	51.94	27	55.1	16	24.21	46	0.5	11	54.31	35	11.7	24	3.67	28	37.4
30.8	52.23	29	53.4	17	24.71	50	0.1	4	54.69	38	9.4	23	3.97	30	38.0
May 10.8	52.54	31	51.6	18	25.24	53	0.3	2	55.10	41	7.4	20	4.29	32	39.1
20.8	52.86	32	49.7	19	25.79	55	1.0	7	55.52	42	5.6	18	4.62	33	40.6
30.7	53.18	32	47.9	18	26.33	54	2.4	14	55.96	44	4.1	15	4.95	33	42.4
June 9.7	53.51	33	46.1	18	26.86	53	4.3	19	56.39	43	3.0	11	5.28	33	44.6
19.7	53.83	32	44.4	17	27.35	49	6.6	23	56.81	42	2.3	7	5.60	32	47.0
29.6	54.13	30	42.8	16	27.80	45	9.4	28	57.20	39	1.9	4	5.90	30	49.6
July 9.6	54.41	28	41.4	14	28.20	40	12.5	31	57.57	37	2.0	1	6.17	27	52.3
19.6	54.66	25	40.2	12	28.53	33	15.9	34	57.90	33	2.4	4	6.41	24	55.1
29.6	54.86	20	39.3	9	28.79	26	19.5	36	58.17	27	3.2	8	6.61	20	57.8
Aug. 8.5	55.03	17	38.6	7	28.97	18	23.2	37	58.39	22	4.3	11	6.76	15	60.5
18.5	55.16	13	38.1	5	29.07	10	26.9	37	58.55	16	5.7	14	6.87	11	63.1
28.5	55.23	7	37.9	2	29.09	2	30.6	37	58.64	9	7.3	16	6.93	6	65.6
Sept. 7.5	55.26	3	37.9	0	29.04	5	34.2	36	58.67	3	9.1	18	6.95	2	67.8
17.4	55.25	1	38.1	2	28.91	13	37.6	34	58.64	3	11.0	19	6.92	3	69.8
27.4	55.21	4	38.4	3	28.71	20	40.7	31	58.56	8	12.8	18	6.86	6	71.5
Oct. 7.4	55.13	8	38.9	5	28.46	25	43.5	28	58.42	14	14.5	17	6.77	9	72.9
17.3	55.02	11	39.4	5	28.16	30	45.9	24	58.25	17	16.1	16	6.65	12	74.0
27.3	54.90	12	40.0	6	27.81	35	47.8	19	58.05	20	17.5	14	6.51	14	74.7
Nov. 6.3	54.77	13	40.6	6	27.44	37	49.3	15	57.83	22	18.6	11	6.37	14	75.1
16.3	54.64	13	41.2	6	27.05	39	50.2	9	57.60	23	19.3	7	6.22	15	75.2
26.2	54.51	13	41.8	6	26.65	40	50.6	4	57.38	22	19.6	3	6.07	15	74.9
Dec. 6.2	54.40	11	42.2	4	26.26	39	50.4	2	57.18	20	19.5	1	5.93	14	74.3
16.2	54.30	10	42.6	4	25.88	38	49.6	8	57.00	18	19.0	5	5.81	12	73.3
26.2	54.23	7	42.9	3	25.54	34	48.2	14	56.86	14	18.1	9	5.70	11	72.0
36.1	54.17	6	43.1	2	25.24	30	46.4	18	56.75	11	16.9	12	5.62	8	70.5
Sec δ, Tan δ	1.032		−0.255		2.157		+1.911		1.477		−1.086		1.103		+0.46
Mean Place	50ˢ.877		57″.16		25ˢ.475		14″.15		52ˢ.890		24″.06		3ˢ.194		46″.17
$D'_\psi a$, $D_\omega a$	0.00		+0.01		−0.02		−0.11		+0.01		+0.06		−0.01		−0.03
$D_\psi \delta$, $D_\omega \delta$	+0.3		−0.5		+0.3		−0.5		+0.3		−0.5		+0.3		−0.5

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**θ Pegasi.** Mag. 3.7				**π Pegasi.** Mag. 4.4				**ζ Cephei.** Mag. 3.6				**24 Cephei.** Mag. 5.0			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 22 5		° ′ + 5 46		h m 22 6		° ′ +32 45		h m 22 7		° ′ +57 46		h m 22 8		° ′ +71 55	
	s		″		s		″		s		″		s		″	
an. 1.1	54.42		45.4		11.88		45.8		52.35		67.9		6.79		34.9	
11.1	54.37	5	44.4	10	11.80	8	44.0	18	52.12	23	65.8	21	6.31	48	32.9	20
21.1	54.36	1	43.4	10	11.74	6	42.0	20	51.95	17	63.4	24	5.92	39	30.4	25
31.1	54.37	1	42.5	9	11.72	2	39.8	22	51.83	12	60.6	28	5.64	28	27.6	28
eb. 10.0	54.40	3	41.6	9	11.73	1	37.6	22	51.78	5	57.7	29	5.47	17	24.6	30
20.0	54.47	7	40.9	7	11.78	5	35.5	21	51.79	1	54.7	30	5.42	5	21.4	32
ar. 2.0	54.57	10	40.3	6	11.87	9	33.5	20	51.88	9	51.8	29	5.51	9	18.3	31
12.0	54.70	13	40.0	3	12.00	13	31.7	18	52.04	16	49.1	27	5.73	22	15.3	30
21.9	54.86	16	40.0	0	12.18	18	30.3	14	52.27	23	46.7	24	6.07	34	12.6	27
31.9	55.06	20	40.2	2	12.39	21	29.3	10	52.56	29	44.7	20	6.52	45	10.3	23
pr. 10.9	55.29	23	40.8	6	12.64	25	28.6	7	52.91	35	43.2	15	7.08	56	8.4	19
20.8	55.55	26	41.7	9	12.93	29	28.5	1	53.32	41	42.3	9	7.72	64	7.1	13
30.8	55.83	28	42.9	12	13.25	32	28.9	4	53.77	45	41.9	4	8.43	71	6.4	7
ay 10.8	56.13	30	44.4	15	13.58	33	29.8	9	54.24	47	42.1	2	9.17	74	6.2	2
20.8	56.44	31	46.2	18	13.93	35	31.1	13	54.73	49	42.9	8	9.94	77	6.7	5
30.7	56.76	32	48.1	19	14.28	35	32.8	17	55.22	49	44.3	14	10.70	76	7.8	11
June 9.7	57.08	32	50.1	20	14.63	35	35.0	22	55.69	47	46.2	19	11.43	73	9.4	16
19.7	57.39	31	52.3	22	14.96	33	37.4	24	56.14	45	48.5	23	12.12	69	11.6	22
29.7	57.68	29	54.5	22	15.27	31	40.1	27	56.56	42	51.3	28	12.74	62	14.2	26
July 9.6	57.94	26	56.6	21	15.56	29	42.9	28	56.93	37	54.4	31	13.29	55	17.2	30
19.6	58.18	24	58.7	21	15.80	24	45.9	30	57.24	31	57.7	33	13.74	45	20.6	34
29.6	58.38	20	60.7	20	16.00	20	48.9	30	57.49	25	61.2	35	14.08	34	24.2	36
Aug. 8.5	58.54	16	62.5	18	16.16	16	51.9	30	57.67	18	64.9	37	14.32	24	27.9	37
18.5	58.66	12	64.1	16	16.27	11	54.9	30	57.78	11	68.5	36	14.45	13	31.7	38
28.5	58.73	7	65.5	14	16.33	6	57.7	28	57.82	4	72.1	36	14.46	1	35.5	38
Sept. 7.5	58.76	3	66.7	12	16.35	2	60.3	26	57.80	2	75.6	35	14.36	10	39.2	37
17.4	58.75	1	67.7	10	16.32	3	62.6	23	57.71	9	78.9	33	14.15	21	42.8	36
27.4	58.71	4	68.4	7	16.25	7	64.7	21	57.56	15	81.9	30	13.84	31	46.1	33
Oct. 7.4	58.63	8	68.9	5	16.14	11	66.5	18	57.35	21	84.6	27	13.45	39	49.2	31
17.4	58.53	10	69.2	3	16.01	13	67.9	14	57.11	24	87.0	24	12.97	48	51.9	27
27.3	58.42	11	69.3	1	15.86	15	69.0	11	56.83	28	88.9	19	12.43	54	54.1	22
Nov. 6.3	58.30	12	69.2	1	15.69	17	69.6	6	56.52	31	90.3	14	11.84	59	55.9	18
16.3	58.17	13	68.9	3	15.52	17	69.9	3	56.20	32	91.2	9	11.21	63	57.1	12
26.2	58.05	12	68.4	5	15.36	16	69.8	1	55.87	33	91.5	3	10.57	64	57.8	7
Dec. 6.2	57.94	11	67.7	7	15.20	16	69.2	6	55.54	33	91.3	2	9.94	63	57.9	1
16.2	57.84	10	67.0	7	15.05	15	68.2	10	55.24	30	90.5	8	9.32	62	57.3	6
26.2	57.76	8	66.1	9	14.92	13	66.9	13	54.95	29	89.2	13	8.74	58	56.1	12
36.1	57.70	6	65.2	9	14.82	10	65.3	16	54.70	25	87.4	18	8.22	52	54.4	17
ec δ, Tan δ	1.005		+0.101		1.189		+0.644		1.876		+1.587		3.223		+3.064	
ean Place	$54^{\mathrm{s}}.752$		$45''.54$		$12^{\mathrm{s}}.671$		$38''.64$		$54^{\mathrm{s}}.209$		$55''.24$		$10^{\mathrm{s}}.570$		$20''.20$	
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		−0.01		−0.01		−0.04		−0.02		−0.09		−0.04		−0.18	
$D_{\psi}\delta$, $D_{\omega}\delta$	+0.3		−0.5		+0.3		−0.5		+0.4		−0.5		+0.4		−0.5	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	θ Aquarii.				α Tucanæ.				γ Aquarii.				31 Pegasi.			
	Mag. 4.3				Mag. 2.9				Mag. 4.0				Mag. 4.9			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N	
	h m		° ′		h m		° ′		h m		° ′		h m		°	
	22 12		− 8 12		22 12		−60 40		22 17		− 1 48		22 17		+11 4	
	s		″		s		″		s		″		s		″	
Jan. 1.1	20.78	4	28.7	4	41.11	16	75.9	20	15.78	5	59.3	6	19.70	5	37.4	
11.1	20.74	2	29.1	3	40.95	11	73.9	24	15.73	2	59.9	6	19.65	3	36.3	
21.1	20.72	1	29.4	2	40.84	5	71.5	27	15.71	0	60.5	5	19.62	1	35.1	
31.1	20.73	4	29.6	0	40.79	2	68.8	29	15.71	3	61.0	4	19.61	2	33.8	
Feb. 10.0	20.77	7	29.6	1	40.81	9	65.9	30	15.74	6	61.4	3	19.63	5	32.6	
20.0	20.84	10	29.5	3	40.90	15	62.9	32	15.80	9	61.7	1	19.68	9	31.6	
Mar. 2.0	20.94	13	29.2	5	41.05	21	59.7	32	15.89	12	61.8	2	19.77	12	30.7	
12.0	21.07	16	28.7	8	41.26	28	56.5	32	16.01	16	61.6	4	19.89	15	30.0	
21.9	21.23	19	27.9	10	41.54	33	53.3	31	16.17	19	61.2	6	20.04	19	29.7	
31.9	21.42	23	26.9	12	41.87	39	50.2	29	16.36	22	60.6	10	20.23	22	29.6	
Apr. 10.9	21.65	25	25.7	15	42.26	44	47.3	27	16.58	25	59.6	12	20.45	25	29.9	
20.8	21.90	28	24.2	16	42.70	48	44.6	25	16.83	27	58.4	14	20.70	28	30.6	
30.8	22.18	30	22.6	17	43.18	52	42.1	21	17.10	30	57.0	16	20.98	30	31.6	
May 10.8	22.48	31	20.9	19	43.70	55	40.0	18	17.40	31	55.4	18	21.28	31	32.9	
20.8	22.79	33	19.0	19	44.25	55	38.2	13	17.71	32	53.6	20	21.59	32	34.5	
30.7	23.12	32	17.1	19	44.80	56	36.9	9	18.03	32	51.6	20	21.91	32	36.4	
June 9.7	23.44	31	15.2	19	45.36	55	36.0	5	18.35	31	49.6	20	22.23	31	38.5	
19.7	23.75	30	13.3	18	45.91	52	35.5	0	18.66	29	47.6	20	22.54	30	40.7	
29.7	24.05	28	11.5	17	46.43	48	35.5	5	18.95	28	45.6	19	22.84	28	43.0	
July 9.6	24.33	25	9.8	14	46.91	42	36.0	9	19.23	25	43.7	18	23.12	24	45.4	
19.6	24.58	21	8.4	13	47.33	37	36.9	13	19.48	21	41.9	16	23.36	21	47.7	
29.6	24.79	17	7.1	11	47.70	29	38.2	17	19.69	17	40.3	14	23.57	16	49.9	
Aug. 8.5	24.96	13	6.0	9	47.99	21	39.9	19	19.86	13	38.9	12	23.73	13	52.1	
18.5	25.09	8	5.1	6	48.20	12	41.8	22	19.99	9	37.7	10	23.86	8	54.0	
28.5	25.17	5	4.5	3	48.32	4	44.0	24	20.08	4	36.7	8	23.94	4	55.8	
Sept. 7.5	25.22	0	4.2	2	48.36	5	46.4	24	20.12	0	35.9	5	23.98	0	57.4	
17.4	25.22	4	4.0	0	48.31	13	48.8	23	20.12	3	35.4	3	23.98	4	58.7	10
27.4	25.18	7	4.0	2	48.18	20	51.1	21	20.09	6	35.1	2	23.94	7	59.7	
Oct. 7.4	25.11	9	4.2	4	47.98	25	53.2	20	20.03	9	34.9	1	23.87	9	60.5	
17.4	25.02	12	4.6	4	47.73	30	55.2	16	19.94	11	35.0	2	23.78	11	61.1	
27.3	24.90	12	5.0	5	47.43	33	56.8	11	19.83	11	35.2	3	23.67	12	61.4	1
Nov. 6.3	24.78	12	5.5	5	47.10	35	57.9	8	19.72	12	35.5	4	23.55	13	61.5	1
16.3	24.66	12	6.0	5	46.75	34	58.7	2	19.60	12	35.9	5	23.42	12	61.4	4
26.2	24.54	11	6.5	6	46.41	32	58.9	2	19.48	11	36.4	6	23.30	12	61.0	6
Dec. 6.2	24.43	10	7.1	5	46.09	30	58.7	8	19.37	10	37.0	7	23.18	11	60.4	8
16.2	24.33	8	7.6	5	45.79	25	57.9	13	19.27	9	37.7	6	23.07	9	59.6	10
26.2	24.25	6	8.1	4	45.54	21	56.6	17	19.18	6	38.3	7	22.98	7	58.6	11
36.1	24.19		8.5		45.33		54.9		19.12		39.0		22.91		57.5	
Sec δ, Tan δ	1.010		−0.144		2.042		−1.781		1.000		−0.032		1.022		+0.209	
Mean Place	20ˢ.960		24″.85		41ˢ.227		60″.76		15ˢ.987		57″.39		20ˢ.054		35″.35	
$D'_\psi a$, $D_\omega a$	0.00		+0.01		+0.02		+0.11		0.00		0.00		0.00		−0.01	
δ, $D_\omega \delta$	+0.4		−0.5		+0.4		−0.5		+0.4		−0.4		+0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	8 Lacertæ. Mag. 4.6				π Aquarii. Mag. 4.6				σ Aquarii. Mag. 4.9				α Lacertæ. Mag. 3.8			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	22 20		+51 47		22 20		+ 0 56		22 26		−11 6		22 27		+49 50	
	s		″		s		″		s		″		s		″	
an. 1.2	11.55		82.9		55.95		43.3		8.95		51.9		46.04		55.2	
11.1	11.36	19	81.0	19	55.90	5	42.6	7	8.90	5	52.2	3	45.86	18	53.4	18
21.1	11.22	14	78.7	23	55.87	3	41.8	8	8.87	3	52.3	1	45.72	14	51.1	23
31.1	11.12	10	76.1	26	55.87	0	41.2	6	8.86	1	52.3	0	45.62	10	48.6	25
eb. 10.0	11.07	5	73.3	28	55.89	2	40.6	6	8.89	3	52.2	1	45.57	5	45.9	27
20.0	11.08	1	70.5	28	55.95	6	40.2	4	8.94	5	51.9	3	45.57	0	43.2	27
ar. 2.0	11.15	7	67.8	27	56.03	8	39.9	3	9.02	8	51.4	5	45.63	6	40.6	26
12.0	11.28	13	65.2	26	56.15	12	39.9	0	9.14	12	50.6	8	45.75	12	38.1	25
21.9	11.46	18	63.0	22	56.30	15	40.2	3	9.29	15	49.7	9	45.93	18	35.9	22
31.9	11.71	25	61.1	19	56.48	18	40.7	5	9.47	18	48.5	12	46.16	23	34.1	18
Apr. 10.9	12.02	31	59.7	14	56.70	22	41.5	8	9.69	22	47.1	14	46.45	29	32.7	14
20.9	12.37	35	58.8	9	56.95	25	42.6	11	9.94	25	45.6	15	46.78	33	31.8	9
30.8	12.75	38	58.5	3	57.22	27	44.0	14	10.21	27	43.8	18	47.15	37	31.4	4
May 10.8	13.17	42	58.7	2	57.51	29	45.5	15	10.51	30	42.0	18	47.55	40	31.6	2
20.8	13.60	43	59.5	8	57.82	31	47.3	18	10.82	31	40.1	19	47.97	42	32.4	8
30.7	14.04	44	60.8	13	58.14	32	49.2	19	11.14	32	38.1	20	48.40	43	33.7	13
June 9.7	14.48	44	62.6	18	58.46	32	51.2	20	11.47	33	36.2	19	48.82	42	35.5	18
19.7	14.89	41	64.9	23	58.77	31	53.3	21	11.79	32	34.3	19	49.23	41	37.7	22
29.7	15.28	39	67.6	27	59.07	30	55.4	21	12.10	31	32.6	17	49.61	38	40.3	26
July 9.6	15.63	35	70.6	30	59.34	27	57.4	20	12.38	28	31.0	16	49.96	35	43.3	30
19.6	15.93	30	73.8	32	59.59	25	59.3	19	12.64	26	29.6	14	50.27	31	46.5	32
29.6	16.18	25	77.3	35	59.80	21	61.0	17	12.86	22	28.4	12	50.52	25	49.8	33
Aug. 8.6	16.38	20	80.8	35	59.98	18	62.6	16	13.05	19	27.4	10	50.72	20	53.3	35
18.5	16.51	13	84.3	35	60.11	13	64.0	14	13.20	15	26.7	7	50.87	15	56.8	35
28.5	16.58	7	87.7	34	60.20	9	65.2	12	13.30	10	26.3	4	50.96	9	60.2	34
Sept. 7.5	16.59	1	91.1	34	60.25	5	66.1	9	13.35	5	26.1	2	50.98	2	63.5	33
17.4	16.54	5	94.3	32	60.26	1	66.8	7	13.36	1	26.1	0	50.95	3	66.6	31
27.4	16.44	10	97.2	29	60.23	3	67.3	5	13.34	2	26.3	2	50.87	8	69.5	29
Oct. 7.4	16.29	15	99.8	26	60.17	6	67.6	3	13.28	6	26.6	3	50.75	12	72.1	26
17.4	16.11	18	102.0	22	60.08	9	67.7	1	13.19	9	27.1	5	50.58	17	74.3	22
27.3	15.89	22	103.8	18	59.98	10	67.6	1	13.09	10	27.6	5	50.38	20	76.1	18
Nov. 6.3	15.65	24	105.2	14	59.86	12	67.3	3	12.97	12	28.2	6	50.16	22	77.6	15
16.3	15.39	26	106.1	9	59.74	12	66.9	4	12.85	12	28.8	6	49.93	23	78.5	9
26.3	15.13	26	106.4	3	59.62	12	66.4	5	12.73	12	29.4	6	49.68	25	78.9	4
Dec. 6.2	14.87	26	106.3	1	59.51	11	65.8	6	12.61	12	30.0	6	49.44	24	78.7	2
16.2	14.62	25	105.6	7	59.41	10	65.2	6	12.51	10	30.5	5	49.21	23	78.1	6
26.2	14.39	23	104.3	13	59.32	9	64.4	8	12.42	9	30.9	4	48.99	22	76.9	12
36.1	14.19	20	102.6	17	59.26	6	63.7	7	12.36	6	31.3	4	48.80	19	75.4	15
Sec δ, Tan δ	1.617		+1.271		1.000		+0.017		1.019		−0.196		1.551		+1.185	
Mean Place	12ˢ.924		70″.39		56ˢ.163		44″.29		9ˢ.036		47″.60		47ˢ.263		42″.51	
$D'_\psi \alpha$, $D_\omega \alpha$	−0.01		−0.08		0.00		0.00		0.00		+0.01		−0.01		−0.07	
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	υ Aquarii. Mag. 5.3				226 B. Cephei. Mag. 5.7				η Aquarii. Mag. 4.1				10 Lacertæ. Mag. 4.9		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.
	h m 22 30		° ′ −21 8		h m 22 30		° ′ +75 47		h m 22 30		° ′ − 0 32		h m 22 35		° ′ +38 36
	s		″		s		″		s		″		s		″
Jan. 1.2	2.73		45.9		42.59		35.0		59.19		82.3		25.96		37.6
11.1	2.67	6	45.7	2	41.91	68	33.3	17	59.13	6	83.0	7	25.84	12	36.0
21.1	2.64	3	45.4	3	41.33	58	31.1	22	59.10	3	83.7	7	25.74	10	34.0
31.1	2.63	1	44.9	5	40.87	46	28.5	26	59.09	1	84.2	5	25.67	7	31.8
Feb. 10.0	2.65	2	44.1	8	40.56	31	25.6	29	59.10	1	84.7	5	25.64	3	29.5
20.0	2.70	5	43.1	10	40.40	16	22.5	31	59.15	5	85.0	3	25.65	1	27.2
Mar. 2.0	2.78	8	42.0	11	40.40	0	19.3	32	59.22	7	85.2	2	25.71	6	25.0
12.0	2.90	12	40.7	13	40.57	17	16.2	31	59.33	11	85.1	1	25.81	10	22.9
21.9	3.05	15	39.2	15	40.91	34	13.4	28	59.47	14	84.7	4	25.96	15	21.1
31.9	3.24	19	37.5	17	41.40	49	10.8	26	59.65	18	84.1	6	26.16	20	19.7
Apr. 10.9	3.46	22	35.6	19	42.02	62	8.7	21	59.85	20	83.3	8	26.40	24	18.7
20.9	3.71	25	33.7	19	42.76	74	7.0	17	60.09	24	82.1	12	26.68	28	18.2
30.8	3.99	28	31.7	20	43.59	83	6.0	10	60.36	27	80.7	14	26.99	31	18.2
May 10.8	4.30	31	29.7	20	44.49	90	5.5	5	60.65	29	79.1	16	27.34	35	18.6
20.8	4.62	32	27.6	21	45.43	94	5.6	1	60.96	31	77.3	18	27.70	36	19.6
30.7	4.96	34	25.7	19	46.38	95	6.3	7	61.28	32	75.4	19	28.07	37	21.0
June 9.7	5.30	34	23.9	18	47.31	93	7.6	13	61.60	32	73.4	20	28.44	37	22.9
19.7	5.63	33	22.2	17	48.19	88	9.4	18	61.91	31	71.3	21	28.81	37	25.2
29.7	5.96	33	20.7	15	49.00	81	11.7	23	62.22	31	69.3	20	29.15	34	27.7
July 9.6	6.26	30	19.5	12	49.72	72	14.5	28	62.50	28	67.3	20	29.47	32	30.5
19.6	6.53	27	18.5	10	50.34	62	17.6	31	62.75	25	65.4	19	29.75	28	33.5
29.6	6.77	24	17.8	7	50.84	50	21.0	34	62.97	22	63.7	17	29.99	24	36.6
Aug. 8.6	6.97	20	17.4	4	51.21	37	24.7	37	63.16	19	62.2	15	30.19	20	39.8
18.5	7.12	15	17.3	1	51.44	23	28.4	37	63.30	14	60.9	13	30.34	15	42.9
28.5	7.23	11	17.4	1	51.53	9	32.3	39	63.40	10	59.8	11	30.43	9	46.0
Sept. 7.5	7.29	6	17.8	4	51.48	5	36.1	38	63.46	6	59.0	8	30.48	5	48.9
17.4	7.31	2	18.4	6	51.30	18	39.9	38	63.48	2	58.4	6	30.48	0	51.6
27.4	7.28	3	19.1	7	50.99	31	43.4	35	63.45	3	58.0	4	30.43	5	54.1
Oct. 7.4	7.22	6	20.0	9	50.56	43	46.7	33	63.40	5	57.7	3	30.35	8	56.2
17.4	7.13	9	20.9	9	50.03	53	49.7	30	63.33	7	57.7	0	30.24	11	58.1
27.3	7.02	11	21.8	9	49.40	63	52.3	26	63.23	10	57.9	2	30.10	14	59.6
Nov. 6.3	6.90	12	22.7	9	48.69	71	54.4	21	63.12	11	58.2	3	29.93	17	60.7
16.3	6.77	13	23.5	8	47.92	77	56.1	17	63.00	12	58.6	4	29.76	17	61.3
26.3	6.64	13	24.1	6	47.11	81	57.2	11	62.88	12	59.1	5	29.58	18	61.5
Dec. 6.2	6.51	13	24.6	5	46.29	82	57.6	4	62.77	11	59.7	6	29.40	18	61.3
16.2	6.40	11	25.0	4	45.47	82	57.4	2	62.67	10	60.4	7	29.23	17	60.6
26.2	6.30	10	25.1	1	44.68	79	56.6	8	62.58	9	61.0	6	29.07	16	59.6
36.1	6.23	7	25.1	0	43.96	72	55.3	13	62.51	7	61.7	7	28.93	14	58.1
Sec δ, Tan δ	1.072		−0.387		4.074		+3.950		1.000		−0.010		1.280		+0.799
Mean Place	$2^s.730$		$38''.83$		$47^s.103$		$17''.92$		$59^s.337$		$81''.30$		$26^s.725$		$27''.07$
D′ψ α, Dω α	0.00		+0.02		−0.04		−0.24		0.00		0.00		−0.01		−0.05
	+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.4

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	**ε Piscis Australis.** Mag. 4.2				**ζ Pegasi.** Mag. 3.6				**β Octantis.** Mag. 4.3				**β Gruis.** Mag. 2.2			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 22 35		° ′ −27 28		h m 22 37		° ′ +10 23		h m 22 37		° ′ −81 49		h m 22 37		° ′ −47 19	
	s		″		s		″		s		″		s		″	
n. 1.2	57.47		83.5		13.11		16.8		25.91		56.7		35.99		59.6	
11.1	57.40	7	83.1	4	13.04	7	15.7	11	24.93	98	54.2	25	35.87	12	58.3	13
21.1	57.35	5	82.5	6	13.00	4	14.6	11	24.15	78	51.3	29	35.79	8	56.7	16
31.1	57.34	1	81.6	9	12.98	2	13.5	11	23.59	56	48.0	33	35.74	5	54.8	19
eb. 10.1	57.35	1	80.5	11	12.98	0	12.4	11	23.26	33	44.4	36	35.74	0	52.6	22
20.0	57.39	4	79.1	14	13.01	3	11.5	9	23.18	8	40.6	38	35.78	4	50.1	25
ar. 2.0	57.47	8	77.6	15	13.08	7	10.7	8	23.33	15	36.8	38	35.86	8	47.5	26
12.0	57.58	11	75.9	17	13.18	10	10.2	5	23.72	39	33.0	38	35.99	13	44.8	27
21.9	57.73	15	74.0	19	13.31	13	9.9	3	24.33	61	29.2	38	36.17	18	41.9	29
31.9	57.92	19	72.0	20	13.48	17	9.9	0	25.15	82	25.6	36	36.39	22	39.1	28
pr. 10.9	58.14	22	69.9	21	13.69	21	10.2	3	26.17	102	22.3	33	36.66	27	36.3	28
20.9	58.40	26	67.7	22	13.92	23	10.9	7	27.36	119	19.3	30	36.97	31	33.5	28
30.8	58.69	29	65.5	22	14.19	27	11.9	10	28.70	134	16.6	27	37.32	35	30.9	26
ay 10.8	59.00	31	63.3	22	14.48	29	13.2	13	30.17	147	14.3	23	37.70	38	28.5	24
20.8	59.33	33	61.2	21	14.79	31	14.8	16	31.73	156	12.5	18	38.10	40	26.4	21
30.8	59.68	35	59.2	20	15.11	32	16.7	19	33.34	161	11.3	12	38.52	42	24.6	18
une 9.7	60.03	35	57.4	18	15.43	32	18.7	20	34.98	164	10.5	8	38.95	43	23.1	15
19.7	60.38	35	55.8	16	15.75	32	20.9	22	36.60	162	10.3	2	39.38	43	21.9	12
29.7	60.71	33	54.5	13	16.06	31	23.1	22	38.16	156	10.6	3	39.79	41	21.2	7
uly 9.6	61.03	32	53.5	10	16.34	28	25.4	23	39.62	146	11.5	9	40.18	39	20.9	3
19.6	61.32	29	52.8	7	16.60	26	27.7	23	40.93	131	12.8	13	40.54	36	21.0	1
29.6	61.57	25	52.4	4	16.82	22	29.9	22	42.06	113	14.6	18	40.84	30	21.6	6
ug. 8.6	61.78	21	52.3	1	17.01	19	31.9	20	42.98	92	16.9	23	41.10	26	22.5	9
18.5	61.95	17	52.5	2	17.16	15	33.8	19	43.65	67	19.4	25	41.30	20	23.8	13
28.5	62.07	12	53.0	5	17.26	10	35.5	17	44.06	41	22.1	27	41.44	14	25.3	15
ept. 7.5	62.14	7	53.7	7	17.32	6	37.0	15	44.18	12	25.0	29	41.52	8	27.1	18
17.5	62.16	2	54.7	10	17.34	2	38.3	13	44.01	17	28.0	30	41.53	1	29.0	19
27.4	62.13	3	55.8	11	17.32	2	39.3	10	43.57	44	30.8	28	41.49	4	31.0	20
ct. 7.4	62.07	6	56.9	11	17.27	5	40.1	8	42.87	70	33.4	26	41.39	10	33.0	20
17.4	61.98	9	58.1	12	17.20	7	40.7	6	41.93	94	35.7	23	41.25	14	34.8	18
27.3	61.86	12	59.2	11	17.10	10	41.0	3	40.80	113	37.6	19	41.08	17	36.5	17
Nov. 6.3	61.73	13	60.3	11	16.99	11	41.0	0	39.51	129	39.0	14	40.88	20	37.9	14
16.3	61.59	14	61.2	9	16.87	12	40.9	1	38.12	139	39.8	8	40.66	22	38.9	10
26.3	61.44	15	61.9	7	16.75	12	40.6	3	36.69	143	40.0	2	40.44	22	39.6	7
Dec. 6.2	61.30	14	62.4	5	16.64	11	40.0	6	35.26	143	39.6	4	40.23	21	39.8	2
16.2	61.18	12	62.6	2	16.53	11	39.3	7	33.90	136	38.6	10	40.03	20	39.7	1
26.2	61.07	11	62.6	0	16.43	10	38.4	9	32.64	126	36.9	17	39.86	17	39.1	6
36.2	60.98	9	62.4	2	16.36	7	37.4	10	31.54	110	34.7	22	39.71	15	38.1	10
ec δ, Tan δ	1.127		−0.520		1.017		+0.183		7.033		−6.962		1.475		−1.085	
ean Place	57ˢ.401		74″.91		13ˢ.343		14″.19		26ˢ.383		39″.87		35ˢ.848		46″.45	
$_\psi\alpha$, $D_\omega\alpha$	0.00		+0.03		0.00		−0.01		+0.07		+0.44		+0.01		+0.07	
$_\psi\delta$, $D_\omega\delta$	+0.4		−0.4		+0.4		−0.4		+0.4		−0.4		+0.4		−0.4	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	η Pegasi. Mag. 3.1				λ Pegasi. Mag. 4.1				δ Gruis. Mag. 3.7				τ Aquarii. Mag. 4.2		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	22 39		+29 46		22 42		+23 6		22 43		−51 45		22 45		−14
	s		″		s		″		s		″		s		″
Jan. 1.2	0.42		42.9		25.72		71.6		25.75		64.5		5.63		34.0
11.1	0.32	10	41.4	15	25.64	8	70.3	13	25.60	15	63.1	14	5.57	6	34.2
21.1	0.24	8	39.7	17	25.57	7	68.8	15	25.50	10	61.3	18	5.52	5	34.2
31.1	0.19	5	37.8	19	25.53	4	67.1	17	25.43	7	59.1	22	5.50	2	34.0
Feb. 10.1	0.17	2	35.8	20	25.52	1	65.5	16	25.41	2	56.7	24	5.51	1	33.7
20.0	0.19	2	33.9	19	25.54	2	63.9	16	25.43	2	54.1	26	5.54	3	33.2
Mar. 2.0	0.25	6	32.0	19	25.59	5	62.4	15	25.51	8	51.3	28	5.60	6	32.5
12.0	0.34	9	30.4	16	25.69	10	61.1	13	25.64	13	48.3	30	5.70	10	31.5
21.9	0.48	14	29.1	13	25.82	13	60.1	10	25.81	17	45.3	30	5.83	13	30.4
31.9	0.66	18	28.0	11	25.99	17	59.4	7	26.04	23	42.2	31	6.00	17	29.1
Apr. 10.9	0.88	22	27.4	6	26.20	21	59.1	3	26.32	28	39.3	29	6.20	20	27.5
20.9	1.14	26	27.2	2	26.44	24	59.2	1	26.64	32	36.4	29	6.43	23	25.8
30.8	1.43	29	27.5	3	26.72	28	59.7	5	27.01	37	33.7	27	6.69	26	23.9
May 10.8	1.75	32	28.2	7	27.02	30	60.6	9	27.41	40	31.2	25	6.98	29	22.0
20.8	2.09	34	29.4	12	27.34	32	61.9	13	27.84	43	29.0	22	7.29	31	20.0
30.8	2.43	34	31.0	16	27.68	34	63.5	16	28.29	45	27.2	18	7.62	33	17.9
June 9.7	2.78	35	32.9	19	28.02	34	65.5	20	28.75	46	25.7	15	7.95	33	15.9
19.7	3.12	34	35.1	22	28.35	33	67.7	22	29.21	46	24.6	11	8.27	32	14.0
29.7	3.45	33	37.6	25	28.66	31	70.2	25	29.65	44	24.0	6	8.59	32	12.3
July 9.6	3.75	30	40.3	27	28.96	30	72.7	25	30.07	42	23.8	2	8.89	30	10.7
19.6	4.02	27	43.1	28	29.23	27	75.4	27	30.45	38	24.1	3	9.17	28	9.4
29.6	4.26	24	46.0	29	29.46	23	78.0	26	30.79	34	24.8	7	9.41	24	8.3
Aug. 8.6	4.45	19	48.9	29	29.65	19	80.6	26	31.08	29	25.9	11	9.61	20	7.4
18.5	4.60	15	51.7	28	29.80	15	83.2	26	31.30	22	27.3	14	9.77	16	6.9
28.5	4.70	10	54.4	27	29.91	11	85.6	24	31.45	15	29.0	17	9.89	12	6.6
Sept. 7.5	4.75	5	56.9	25	29.97	6	87.7	21	31.54	9	31.0	20	9.96	7	6.5
17.5	4.77	2	59.2	23	29.99	2	89.7	20	31.56	2	33.1	21	10.00	4	6.7
27.4	4.74	3	61.2	20	29.97	2	91.4	17	31.51	5	35.3	22	9.99	1	7.1
Oct. 7.4	4.67	7	63.0	18	29.92	5	92.9	15	31.41	10	37.5	22	9.94	5	7.6
17.4	4.58	9	64.5	15	29.84	8	94.1	12	31.25	16	39.5	20	9.87	7	8.2
27.3	4.46	12	65.6	11	29.74	10	94.9	8	31.05	20	41.2	17	9.78	9	8.9
Nov. 6.3	4.33	13	66.4	8	29.62	12	95.5	6	30.83	22	42.7	15	9.67	11	9.7
16.3	4.19	14	66.8	4	29.49	13	95.7	2	30.59	24	43.9	12	9.55	12	10.4
26.3	4.04	15	66.9	1	29.35	14	95.7	0	30.34	25	44.6	7	9.43	12	11.1
Dec. 6.2	3.89	15	66.6	3	29.22	13	95.3	4	30.10	24	44.8	2	9.31	12	11.7
16.2	3.75	14	65.9	7	29.09	13	94.6	7	29.87	23	44.6	2	9.20	11	12.2
26.2	3.62	13	64.8	11	28.98	11	93.6	10	29.66	21	43.9	7	9.11	9	12.6
36.2	3.51	11	63.5	13	28.88	10	92.4	12	29.49	17	42.8	11	9.03	8	12.8
Sec δ, Tan δ	1.152		+0.572		1.087		+0.427		1.616		−1.269		1.031		−0.250
Mean Place	0ˢ.947		34″.51		26ˢ.109		64″.97		25ˢ.560		50″.53		5ˢ.599		29″.33
$D'_\psi \alpha$, $D_\omega \alpha$	−0.01		−0.04		0.00		−0.03		+0.01		+0.08		0.00		+0.02
— δ, $D_\omega \delta$	+0.4		−0.3		+0.4		−0.3		+0.4		−0.3		+0.4		−0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	μ Pegasi. Mag. 3.7				ι Cephei. Mag. 3.7				λ Aquarii. Mag. 3.8				ρ Indi. Mag. 6.1			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.	
	h m 22 45		° ′ +24 9		h m 22 46		° ′ +65 45		h m 22 48		° ′ − 8 1		h m 22 48		° ′ −70 31	
	s		″		s		″		s		″		s		″	
an. 1.2	53.58		16.1		36.86		28.2		10.85		58.7		45.73		57.7	
11.1	53.49	9	14.7	14	36.49	37	26.6	16	10.79	6	59.1	4	45.35	38	55.6	21
21.1	53.42	7	13.2	15	36.17	32	24.5	21	10.74	5	59.4	3	45.05	30	53.1	25
31.1	53.37	5	11.5	17	35.91	26	22.0	25	10.72	2	59.6	2	44.83	22	50.2	29
eb. 10.1	53.36	1	9.8	17	35.73	18	19.2	28	10.72	0	59.6	0	44.71	12	47.1	31
20.0	53.37	1	8.2	16	35.64	9	16.2	30	10.75	3	59.4	2	44.68	3	43.7	34
ar. 2.0	53.42	5	6.6	16	35.64	0	13.2	30	10.81	6	59.0	4	44.74	6	40.1	36
12.0	53.51	9	5.3	13	35.74	10	10.3	29	10.90	9	58.5	5	44.91	17	36.4	37
22.0	53.64	13	4.2	11	35.93	19	7.5	28	11.03	13	57.7	8	45.17	26	32.8	36
31.9	53.81	17	3.5	7	36.22	29	5.0	25	11.19	16	56.7	10	45.52	35	29.3	35
pr. 10.9	54.02	21	3.1	4	36.59	37	3.0	20	11.38	19	55.4	13	45.96	44	25.9	34
20.9	54.26	24	3.1	0	37.04	45	1.5	15	11.61	23	53.9	15	46.48	52	22.8	31
30.8	54.54	28	3.6	5	37.56	52	0.5	10	11.87	26	52.2	17	47.07	59	19.9	29
ay 10.8	54.84	30	4.4	8	38.12	56	0.0	5	12.15	28	50.4	18	47.73	66	17.4	25
20.8	55.16	32	5.7	13	38.72	60	0.1	1	12.46	31	48.5	19	48.44	71	15.3	21
30.8	55.50	34	7.3	16	39.33	61	0.9	8	12.78	32	46.5	20	49.18	74	13.6	17
June 9.7	55.84	34	9.2	19	39.94	61	2.2	13	13.10	32	44.5	20	49.93	75	12.4	12
19.7	56.17	33	11.5	23	40.53	59	4.0	18	13.42	32	42.5	20	50.68	75	11.8	6
29.7	56.49	32	13.9	24	41.09	56	6.3	23	13.73	31	40.6	19	51.42	74	11.7	1
July 9.7	56.79	30	16.4	25	41.60	51	9.0	27	14.03	30	38.8	18	52.11	69	12.1	4
19.6	57.06	27	19.1	27	42.04	44	12.1	31	14.30	27	37.2	16	52.74	63	13.0	9
29.6	57.30	24	21.8	27	42.42	38	15.4	33	14.54	24	35.8	14	53.30	56	14.3	13
Aug. 8.6	57.50	20	24.4	26	42.72	30	19.0	36	14.74	20	34.6	12	53.77	47	16.1	18
18.5	57.65	15	27.0	26	42.93	21	22.7	37	14.90	16	33.7	9	54.13	36	18.3	22
28.5	57.76	11	29.4	24	43.06	13	26.5	38	15.02	12	33.1	6	54.37	24	20.7	24
Sept. 7.5	57.83	7	31.7	23	43.11	5	30.2	37	15.10	8	32.7	4	54.49	12	23.4	27
17.5	57.85	2	33.7	20	43.07	4	33.8	36	15.13	3	32.5	2	54.49	0	26.1	27
27.4	57.84	1	35.5	18	42.95	12	37.3	35	15.13	0	32.5	0	54.36	13	28.8	27
Oct. 7.4	57.79	5	37.0	15	42.76	19	40.5	32	15.09	4	32.7	2	54.13	23	31.5	27
17.4	57.71	8	38.2	12	42.50	26	43.4	29	15.02	7	33.0	3	53.79	34	33.8	23
27.4	57.61	10	39.2	10	42.19	31	45.9	25	14.93	9	33.5	5	53.37	42	35.9	21
Nov. 6.3	57.49	12	39.8	6	41.83	36	48.0	21	14.83	10	34.1	6	52.88	49	37.5	16
16.3	57.36	13	40.1	3	41.43	40	49.5	15	14.72	11	34.7	6	52.35	53	38.6	11
26.3	57.22	14	40.0	1	41.00	43	50.5	10	14.60	12	35.3	6	51.80	55	39.1	5
Dec. 6.2	57.09	13	39.7	3	40.56	44	51.0	5	14.49	11	35.9	6	51.25	55	39.1	0
16.2	56.96	13	39.0	7	40.12	44	50.8	2	14.38	11	36.5	6	50.72	53	38.5	6
26.2	56.85	11	38.0	10	39.70	42	50.1	7	14.29	9	37.0	5	50.24	48	37.3	12
36.2	56.74	11	36.8	12	39.31	39	48.8	13	14.21	8	37.5	5	49.81	43	35.6	17
Sec δ, Tan δ	1.096		+0.448		2.435		+2.221		1.010		−0.141		3.000		−2.828	
Mean Place	53ˢ.962		8″.89		39ˢ.052		11″.17		10ˢ.851		55″.91		45ˢ.522		41″.31	
$D'_\psi a$, $D_\omega a$	0.00		−0.03		−0.02		−0.14		0.00		+0.01		+0.02		+0.18	
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.3		+0.4		−0.3		+0.4		−0.3		+0.4		−0.3	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	δ Aquarii. Mag. 3.5				α Piscis Australis. (*Fomalhaut.*) Mag. 1.3				o Andromedæ. Mag. 3.6				β Pegasi. Var. 2.2–2.7		
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	22 50		−16 16		22 52		−30 3		22 57		+41 52		22 59		+27 3
	s		″		s		″		s		″		s		″
Jan. 1.2	8.51		28.5		57.59		92.1		59.71		20.9		38.74		26.2
11.1	8.44	7	28.6	1	57.50	9	91.6	5	59.56	15	19.4	15	38.63	11	24.9
21.1	8.39	5	28.5	1	57.44	6	90.9	7	59.43	13	17.5	19	38.55	8	23.3
31.1	8.37	2	28.3	2	57.40	4	89.9	10	59.33	10	15.4	21	38.49	6	21.6
Feb. 10.1	8.37	0	27.8	5	57.39	1	88.7	12	59.27	6	13.1	23	38.45	4	19.9
20.0	8.39	2	27.2	6	57.42	3	87.2	15	59.25	2	10.8	23	38.45	0	18.1
Mar. 2.0	8.45	6	26.3	9	57.48	6	85.5	17	59.28	3	8.5	23	38.48	3	16.4
12.0	8.55	10	25.2	11	57.57	9	83.6	19	59.35	7	6.3	22	38.56	8	14.9
22.0	8.67	12	23.9	13	57.70	13	81.6	20	59.47	12	4.3	20	38.67	11	13.6
31.9	8.83	16	22.4	15	57.87	17	79.4	22	59.65	18	2.7	16	38.83	16	12.6
Apr. 10.9	9.03	20	20.8	16	58.08	21	77.1	23	59.88	23	1.4	13	39.03	20	12.0
20.9	9.26	23	19.0	18	58.33	25	74.8	23	60.15	27	0.6	8	39.27	24	11.8
30.8	9.52	26	17.0	20	58.61	28	72.4	24	60.46	31	0.3	3	39.54	27	12.1
May 10.8	9.81	29	15.0	20	58.91	30	70.1	23	60.81	35	0.4	1	39.84	30	12.8
20.8	10.12	31	12.9	21	59.24	33	67.9	22	61.18	37	1.1	7	40.17	33	13.9
30.8	10.45	33	10.9	20	59.59	35	65.8	21	61.56	38	2.3	12	40.51	34	15.3
June 9.7	10.78	33	8.9	20	59.95	36	63.9	19	61.95	39	3.9	16	40.86	35	17.2
19.7	11.11	33	7.0	19	60.31	36	62.3	16	62.34	39	6.0	21	41.20	34	19.3
29.7	11.43	32	5.3	17	60.66	35	60.9	14	62.71	37	8.4	24	41.54	34	21.7
July 9.7	11.73	30	3.8	15	60.99	33	59.9	10	63.05	34	11.1	27	41.85	31	24.2
19.6	12.01	28	2.5	13	61.29	30	59.2	7	63.36	31	14.0	29	42.14	29	26.9
29.6	12.26	25	1.5	10	61.56	27	58.8	4	63.64	28	17.1	31	42.39	25	29.7
Aug. 8.6	12.47	21	0.8	7	61.79	23	58.8	0	63.86	22	20.2	31	42.60	21	32.4
18.5	12.64	17	0.3	5	61.98	19	59.1	3	64.04	18	23.4	32	42.77	17	35.1
28.5	12.76	12	0.1	2	62.12	14	59.7	6	64.17	13	26.6	32	42.90	13	37.7
Sept. 7.5	12.84	8	0.2	1	62.20	8	60.6	9	64.25	8	29.7	31	42.98	8	40.2
17.5	12.88	4	0.5	3	62.24	4	61.7	11	64.28	3	32.6	29	43.02	4	42.4
27.4	12.87	1	1.0	5	62.24	0	62.9	12	64.26	2	35.3	27	43.01	1	44.4
Oct. 7.4	12.84	3	1.7	7	62.19	5	64.2	13	64.20	6	37.7	24	42.98	3	46.1
17.4	12.77	7	2.4	7	62.11	8	65.6	14	64.10	10	39.8	21	42.91	7	47.6
27.4	12.67	10	3.2	8	62.00	11	66.9	13	63.97	13	41.6	18	42.81	10	48.8
Nov. 6.3	12.56	11	4.0	8	61.87	13	68.1	12	63.82	15	42.9	13	42.70	11	49.6
16.3	12.44	12	4.8	8	61.73	14	69.2	11	63.65	17	43.9	10	42.57	13	50.1
26.3	12.32	12	5.5	7	61.58	15	70.0	8	63.47	18	44.4	5	42.44	13	50.2
Dec. 6.2	12.20	12	6.2	7	61.44	14	70.6	6	63.28	19	44.4	0	42.30	14	50.0
16.2	12.09	11	6.7	5	61.31	13	70.9	3	63.10	18	44.0	4	42.16	14	49.4
26.2	11.99	10	7.0	3	61.19	12	70.9	0	62.92	18	43.2	8	42.04	12	48.6
36.2	11.91	8	7.2	2	61.08	11	70.7	2	62.76	16	41.9	13	41.92	12	47.4
Sec δ, Tan δ	1.042		−0.292		1.156		−0.579		1.343		+0.896		1.129		+0.523
Mean Place	$8^{s}.435$		$23''.30$		$57^{s}.408$		$83''.03$		$60^{s}.406$		$8''.08$		$39^{s}.097$		$17''.25$
$D'_{\psi}a$, $D_{\omega}a$	0.00		+0.02		0.00		+0.04		−0.01		−0.06		0.00		−0.03
$D_{\omega}\delta$	+0.4		−0.3		+0.4		−0.3		+0.4		−0.3		+0.4		−0.3

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**α Pegasi.** (*Markab.*) Mag. 2.6				**55 Pegasi.** Mag. 4.7				**c^2 Aquarii.** Mag. 3.8				**π Cephei.** Mag. 4.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	23 0		+14 44		23 2		+ 8 56		23 4		−21 37		23 5		+74 55	
	s		″		s		″		s		″		s		″	
an. 1.2	31.37		56.7		43.22		63.3		55.16		69.1		7.95		59.7	
11.2	31.28	9	55.6	11	43.14	8	62.4	9	55.08	8	69.1	0	7.27	68	58.4	13
21.1	31.22	6	54.5	11	43.08	6	61.4	10	55.02	6	68.8	3	6.66	61	56.6	18
31.1	31.17	5	53.2	13	43.04	4	60.5	9	54.98	4	68.3	5	6.15	51	54.3	23
eb. 10.1	31.15	2	52.0	12	43.02	2	59.5	10	54.96	2	67.5	8	5.75	40	51.7	26
20.0	31.16	1	50.9	11	43.03	1	58.7	8	54.97	1	66.5	10	5.49	26	48.8	29
lar. 2.0	31.20	4	49.9	10	43.07	4	58.1	6	55.02	5	65.3	12	5.38	11	45.7	31
12.0	31.28	8	49.1	8	43.14	7	57.6	5	55.09	7	63.9	14	5.43	5	42.6	31
22.0	31.39	11	48.5	6	43.25	11	57.4	2	55.21	12	62.3	16	5.63	20	39.6	30
31.9	31.54	15	48.3	2	43.40	15	57.4	0	55.36	15	60.5	18	5.99	36	36.9	27
pr. 10.9	31.72	18	48.3	0	43.58	18	57.8	4	55.54	18	58.6	19	6.49	50	34.5	24
20.9	31.95	23	48.7	4	43.80	22	58.5	7	55.76	22	56.5	21	7.11	62	32.5	20
30.9	32.21	26	49.5	8	44.05	25	59.5	10	56.02	26	54.3	22	7.85	74	31.1	14
lay 10.8	32.49	28	50.6	11	44.33	28	60.8	13	56.31	29	52.1	22	8.67	82	30.2	9
20.8	32.79	30	52.0	14	44.63	30	62.4	16	56.62	31	49.9	22	9.54	87	29.9	3
30.8	33.11	32	53.8	18	44.94	31	64.2	18	56.94	32	47.8	21	10.44	90	30.2	3
une 9.7	33.44	33	55.8	20	45.27	33	66.2	20	57.28	34	45.7	21	11.35	91	31.0	8
19.7	33.77	33	57.9	21	45.59	32	68.3	21	57.62	34	43.8	19	12.24	89	32.4	14
29.7	34.08	31	60.2	23	45.90	31	70.5	22	57.95	33	42.2	16	13.09	85	34.4	20
uly 9.7	34.38	30	62.5	23	46.20	30	72.8	23	58.27	32	40.8	14	13.87	78	36.8	24
19.6	34.66	28	64.9	24	46.48	28	75.0	22	58.57	30	39.6	12	14.56	69	39.6	28
29.6	34.90	24	67.2	23	46.72	24	77.1	21	58.83	26	38.8	8	15.15	59	42.8	32
Aug. 8 6	35.11	21	69.5	23	46.93	21	79.1	20	59.06	23	38.3	5	15.64	49	46.3	35
18.6	35.28	17	71.6	21	47.10	17	81.0	19	59.25	19	38.1	2	16.00	36	50.0	37
28.5	35.40	12	73.5	19	47.22	12	82.6	16	59.39	14	38.2	1	16.23	23	53.8	38
Sept. 7.5	35.48	8	75.3	18	47.31	9	84.0	14	59.48	9	38.6	4	16.34	11	57.6	38
17.5	35.53	5	76.8	15	47.36	5	85.2	12	59.54	6	39.2	6	16.32	2	61.4	38
27.4	35.53	0	78.1	13	47.37	1	86.2	10	59.55	1	40.0	8	16.17	15	65.1	37
Oct. 7.4	35.51	2	79.2	11	47.34	3	86.9	7	59.52	3	40.9	9	15.91	26	68.6	35
17.4	35.45	6	80.0	8	47.29	5	87.4	5	59.46	6	42.0	11	15.53	38	71.9	33
27.4	35.37	8	80.5	5	47.21	8	87.7	3	59.37	9	43.1	11	15.05	48	74.8	29
Nov. 6.3	35.27	10	80.8	3	47.12	9	87.8	1	59.26	11	44.1	10	14.49	56	77.3	25
16.3	35.16	11	80.9	1	47.01	11	87.7	1	59.14	12	45.0	9	13.85	64	79.4	21
26.3	35.05	11	80.7	2	46.90	11	87.4	3	59.01	13	45.9	9	13.16	69	80.9	15
Dec. 6.3	34.93	12	80.3	4	46.79	11	86.9	5	58.89	12	46.6	7	12.43	73	81.8	9
16.2	34.82	11	79.6	7	46.68	11	86.2	7	58.77	12	47.1	5	11.68	75	82.1	3
26.2	34.71	11	78.8	8	46.58	10	85.4	8	58.66	11	47.4	3	10.94	74	81.8	3
36.2	34.61	10	77.8	10	46.49	9	84.6	8	58.56	10	47.5	1	10.23	71	80.9	9
ec δ, Tan δ	1.034		+0.263		1.012		+0.158		1.076		−0.397		3.847		+3.714	
lean Place	31ˢ.530		51″.74		43ˢ.301		60″.14		54ˢ.972		62″.67		11ˢ.435		40″.18	
$_\psi \alpha$, $D_\omega \alpha$	0.00		−0.02		0.00		−0.01		0.00		+0.03		−0.02		−0.24	
$_\psi \delta$, $D_\omega \delta$	+0.4		−0.3		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	**ι Gruis.** Mag. 4.1				**59 Pegasi.** Mag. 5.2				**5 Cassiop.** (Heis). Mag. 5.6				**φ Aquarii.** Mag. 4.4		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declin- tion S
	h m		° ′		h m		° ′		h m		° ′		h m		°
	23 5		−45 41		23 7		+ 8 15		23 9		+56 41		23 9		− 6
	s		″		s		″		s		″		s		″
Jan. 1.2	33.45		99.2		26.62		33.3		9.95		73.2		55.34		28.4
11.2	33.31	14	98.3	9	26.54	8	32.4	9	9.70	25	71.8	14	55.26	8	28.9
21.1	33.20	11	96.9	14	26.47	7	31.5	9	9.48	22	70.0	18	55.20	6	29.3
31.1	33.12	8	95.2	17	26.43	4	30.5	10	9.29	19	67.7	23	55.16	4	29.5
Feb. 10.1	33.07	5	93.1	21	26.41	2	29.7	8	9.16	13	65.2	25	55.14	2	29.6
20.0	33.07	0	90.8	23	26.41	0	28.9	8	9.09	7	62.5	27	55.15	1	29.5
Mar. 2.0	33.11	4	88.3	25	26.45	4	28.3	6	9.08	1	59.7	28	55.19	4	29.3
12.0	33.19	8	85.5	28	26.52	7	27.9	4	9.14	6	57.0	27	55.26	7	28.8
22.0	33.32	13	82.7	28	26.62	10	27.7	2	9.27	13	54.5	25	55.36	10	28.1
31.9	33.50	18	79.8	29	26.76	14	27.8	1	9.48	21	52.2	23	55.50	14	27.1
Apr. 10.9	33.72	22	76.9	29	26.94	18	28.2	4	9.75	27	50.3	19	55.67	17	25.9
20.9	33.99	27	74.0	29	27.15	21	28.9	7	10.09	34	48.9	14	55.88	21	24.5
30.9	34.30	31	71.2	28	27.40	25	29.9	10	10.48	39	47.9	10	56.13	25	22.9
May 10.8	34.65	35	68.5	27	27.68	28	31.2	13	10.92	44	47.5	4	56.40	27	21.1
20.8	35.03	38	66.1	24	27.98	30	32.8	16	11.39	47	47.6	1	56.69	29	19.1
30.8	35.43	40	64.0	21	28.29	31	34.6	18	11.88	49	48.3	7	57.00	31	17.1
June 9.7	35.84	41	62.2	18	28.61	32	36.6	20	12.38	50	49.6	13	57.33	33	15.1
19.7	36.26	42	60.8	14	28.93	32	38.8	22	12.87	49	51.3	17	57.65	32	13.0
29.7	36.67	41	59.7	11	29.25	32	41.0	22	13.34	47	53.5	22	57.97	32	11.0
July 9.7	37.06	39	59.1	6	29.55	30	43.2	22	13.78	44	56.1	26	58.27	30	9.2
19.6	37.42	36	58.9	2	29.83	28	45.4	22	14.18	40	59.0	29	58.55	28	7.5
29.6	37.75	33	59.1	2	30.07	24	47.5	21	14.53	35	62.2	32	58.80	25	6.0
Aug. 8.6	38.03	28	59.8	7	30.29	22	49.4	19	14.83	30	65.6	34	59.02	22	4.7
18.6	38.26	23	60.9	11	30.46	17	51.2	18	15.07	24	69.1	35	59.20	18	3.7
28.5	38.43	17	62.3	14	30.59	13	52.8	16	15.24	17	72.7	36	59.34	14	2.9
Sept. 7.5	38.54	11	63.9	16	30.68	9	54.2	14	15.34	10	76.2	35	59.44	10	2.4
17.5	38.59	5	65.8	19	30.73	5	55.4	12	15.38	4	79.7	35	59.49	5	2.1
27.4	38.59	0	67.8	20	30.75	2	56.3	9	15.36	2	83.0	33	59.51	2	2.0
Oct. 7.4	38.53	6	69.8	20	30.73	2	57.0	7	15.29	7	86.0	30	59.49	2	2.2
17.4	38.43	10	71.8	20	30.68	5	57.5	5	15.16	13	88.8	28	59.45	4	2.5
27.4	38.28	15	73.7	19	30.61	7	57.8	3	14.98	18	91.3	25	59.38	7	2.9
Nov. 6.3	38.11	17	75.3	16	30.52	9	57.8	0	14.77	21	93.3	20	59.28	10	3.5
16.3	37.91	20	76.6	13	30.42	10	57.7	1	14.53	24	94.8	15	59.18	10	4.1
26.3	37.71	20	77.6	10	30.31	11	57.3	4	14.27	26	95.9	11	59.07	11	4.7
Dec. 6.3	37.51	20	78.2	6	30.20	11	56.8	5	13.99	28	96.4	5	58.96	11	5.4
16.2	37.31	20	78.3	1	30.09	11	56.2	6	13.70	29	96.4	0	58.86	10	6.0
26.2	37.13	18	78.0	3	29.99	10	55.4	8	13.42	28	95.8	6	58.76	10	6.6
36.2	36.96	17	77.3	7	29.90	9	54.6	8	13.16	26	94.7	11	58.67	9	7.1
Sec δ, Tan δ	1.432		−1.025		1.010		+0.145		1.821		+1.523		1.006		−0.114
Mean Place	33ˢ.109		86″.60		26ˢ.665		30″.12		11ˢ.138		56″.28		55ˢ.235		26″ 81
$D'_\psi \alpha$, $D_\omega \alpha$	+0.01		+0.07		0.00		−0.01		−0.01		−0.10		0.00		+0.01
δ, $D_\omega \delta$	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

an Solar Date.	ψ Aquarii. Mag. 4.5				γ Tucanæ. Mag. 4.1				γ Piscium. Mag. 3.8				γ Sculptoris. Mag. 4.5			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	23 11		− 9 32		23 12		−58 41		23 12		+ 2 49		23 14		−32 59	
	s		″		s		″		s		″		s		″	
n. 1.2	26.52		65.7		28.99		83.0		45.55		5.2		14.52		52.5	
11.2	26.44	8	66.1	4	28.75	24	81.6	14	45.47	8	4.5	7	14.41	11	52.1	4
21.1	26.38	6	66.3	2	28.56	19	79.8	18	45.41	6	3.8	7	14.32	9	51.3	8
31.1	26.34	4	66.4	1	28.41	15	77.5	23	45.37	4	3.1	7	14.26	6	50.3	10
b. 10.1	26.32	2	66.3	1	28.31	10	74.9	26	45.35	2	2.5	6	14.23	3	48.9	14
20.1	26.32	0	66.1	2	28.27	4	72.0	29	45.35	0	2.1	4	14.22	1	47.3	16
ar. 2.0	26.36	4	65.6	5	28.28	1	68.9	31	45.38	3	1.8	3	14.25	3	45.4	19
12.0	26.43	7	64.9	7	28.35	7	65.6	33	45.45	7	1.7	1	14.32	7	43.4	20
22.0	26.53	10	64.0	9	28.49	14	62.3	33	45.55	10	1.8	1	14.43	11	41.1	23
31.9	26.67	14	62.9	11	28.69	20	58.9	34	45.68	13	2.2	4	14.58	15	38.7	24
pr. 10.9	26.84	17	61.6	13	28.95	26	55.5	34	45.86	18	2.9	7	14.76	18	36.2	25
20.9	27.05	21	60.0	16	29.28	33	52.3	32	46.07	21	3.9	10	14.99	23	33.7	25
30.9	27.30	25	58.2	18	29.65	37	49.3	30	46.31	24	5.2	13	15.25	26	31.1	26
ay 10.8	27.57	27	56.3	19	30.07	42	46.5	28	46.58	27	6.7	15	15.55	30	28.6	25
20.8	27.87	30	54.3	20	30.53	46	44.1	24	46.88	30	8.4	17	15.88	33	26.2	24
30.8	28.18	31	52.3	20	31.03	50	42.0	21	47.19	31	10.3	19	16.23	35	24.0	22
une 9.8	28.50	32	50.2	21	31.55	52	40.3	17	47.51	32	12.3	20	16.59	36	22.0	20
19.7	28.83	33	48.2	20	32.07	52	39.0	13	47.83	32	14.4	21	16.95	36	20.2	18
29.7	29.15	32	46.2	20	32.58	51	38.3	7	48.15	32	16.5	21	17.31	36	18.8	14
uly 9.7	29.46	31	44.4	18	33.08	50	38.0	3	48.45	30	18.6	21	17.66	35	17.7	11
19.6	29.74	28	42.8	16	33.54	46	38.2	2	48.73	28	20.6	20	17.98	32	17.0	7
29.6	30.00	26	41.4	14	33.95	41	38.9	7	48.99	26	22.5	19	18.27	29	16.6	4
ug. 8.6	30.22	22	40.3	11	34.31	36	40.1	12	49.20	21	24.3	18	18.52	25	16.6	0
18.6	30.40	18	39.4	9	34.60	29	41.7	16	49.38	18	25.8	15	18.73	21	17.0	4
28.5	30.54	14	38.8	6	34.82	22	43.6	19	49.52	14	27.1	13	18.89	16	17.7	7
ept. 7.5	30.64	10	38.5	3	34.96	14	45.8	22	49.62	10	28.2	11	19.01	12	18.7	10
17.5	30.70	6	38.4	1	35.02	6	48.2	24	49.68	6	29.1	9	19.07	6	20.0	13
27.5	30.72	2	38.5	1	35.01	1	50.7	25	49.70	2	29.7	6	19.08	1	21.4	14
ct. 7.4	30.71	1	38.8	3	34.92	9	53.2	25	49.69	1	30.1	4	19.05	3	22.9	15
17.4	30.66	5	39.3	5	34.76	16	55.6	24	49.65	4	30.2	1	18.99	6	24.5	16
27.4	30.59	7	39.9	6	34.54	22	57.7	21	49.58	7	30.2	0	18.89	10	26.0	15
ov. 6.3	30.50	9	40.5	6	34.28	26	59.5	18	49.50	8	30.1	1	18.76	13	27.4	14
16.3	30.40	10	41.2	7	33.99	29	61.0	15	49.40	10	29.8	3	18.62	14	28.7	13
26.3	30.29	11	41.9	7	33.68	31	62.0	10	49.30	10	29.3	5	18.47	15	29.7	10
Dec. 6.3	30.18	11	42.6	7	33.37	31	62.5	5	49.19	11	28.7	6	18.32	15	30.4	7
16.2	30.07	11	43.2	6	33.06	31	62.5	0	49.09	10	28.1	6	18.18	14	30.8	4
26.2	29.97	10	43.7	5	32.77	29	61.9	6	48.99	10	27.4	7	18.04	14	30.9	1
36.2	29.88	9	44.2	5	32.51	26	60.8	11	48.90	9	26.7	7	17.92	12	30.7	2
ec δ, Tan δ	1.014		−0.168		1.925		−1.645		1.001		+0.049		1.192		−0.649	
lean Place	26s.377		63″.17		28s.514		68″.12		45s.512		3″.66		14s.195		43″.05	
$_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		+0.01		+0.01		+0.11		0.00		0.00		0.00		+0.04	
$_{\psi}\delta$, $D_{\omega}\delta$	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Gruis. Mag. 4.1				59 Pegasi. Mag. 5.2				5 Cassiop. (Heis). Mag. 5.6				φ Aquarii. Mag. 4.4		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	23 5		−45 41		23 7		+ 8 15		23 9		+56 41		23 9		− 6 3
	s		″		s		″		s		″		s		″
Jan. 1.2	33.45	14	99.2	9	26.62	8	33.3	9	9.95	25	73.2	14	55.34	8	28.4
11.2	33.31	11	98.3	14	26.54	7	32.4	9	9.70	22	71.8	18	55.26	6	28.9
21.1	33.20	8	96.9	17	26.47	4	31.5	10	9.48	19	70.0	23	55.20	4	29.3
31.1	33.12	5	95.2	21	26.43	2	30.5	8	9.29	13	67.7	25	55.16	2	29.5
Feb. 10.1	33.07	0	93.1	23	26.41	0	29.7	8	9.16	7	65.2	27	55.14	1	29.6
20.0	33.07	4	90.8	25	26.41	4	28.9	6	9.09	1	62.5	28	55.15	4	29.5
Mar. 2.0	33.11	8	88.3	28	26.45	7	28.3	4	9.08	6	59.7	27	55.19	7	29.3
12.0	33.19	13	85.5	28	26.52	10	27.9	2	9.14	13	57.0	25	55.26	10	28.8
22.0	33.32	18	82.7	29	26.62	14	27.7	1	9.27	21	54.5	23	55.36	14	28.1
31.9	33.50	22	79.8	29	26.76	18	27.8	4	9.48	27	52.2	19	55.50	17	27.1
Apr. 10.9	33.72	27	76.9	29	26.94	21	28.2	7	9.75	34	50.3	14	55.67	21	25.9
20.9	33.99	31	74.0	28	27.15	25	28.9	10	10.09	39	48.9	10	55.88	25	24.5
30.9	34.30	35	71.2	27	27.40	28	29.9	13	10.48	44	47.9	4	56.13	27	22.9
May 10.8	34.65	38	68.5	24	27.68	30	31.2	16	10.92	47	47.5	1	56.40	29	21.1
20.8	35.03	40	66.1	21	27.98	31	32.8	18	11.39	49	47.6	7	56.69	31	19.1
30.8	35.43	41	64.0	18	28.29	32	34.6	20	11.88	50	48.3	13	57.00	33	17.1
June 9.7	35.84	42	62.2	14	28.61	32	36.6	22	12.38	49	49.6	17	57.33	32	15.1
19.7	36.26	41	60.8	11	28.93	32	38.8	22	12.87	47	51.3	22	57.65	32	13.0
29.7	36.67	39	59.7	6	29.25	30	41.0	22	13.34	44	53.5	26	57.97	30	11.0
July 9.7	37.06	36	59.1	2	29.55	28	43.2	22	13.78	40	56.1	29	58.27	28	9.2
19.6	37.42	33	58.9	2	29.83	24	45.4	21	14.18	35	59.0	32	58.55	25	7.5
29.6	37.75	28	59.1	7	30.07	22	47.5	19	14.53	30	62.2	34	58.80	22	6.0
Aug. 8.6	38.03	23	59.8	11	30.29	17	49.4	18	14.83	24	65.6	35	59.02	18	4.7
18.6	38.26	17	60.9	14	30.46	13	51.2	16	15.07	17	69.1	36	59.20	14	3.7
28.5	38.43	11	62.3	16	30.59	9	52.8	14	15.24	10	72.7	35	59.34	10	2.9
Sept. 7.5	38.54	5	63.9	19	30.68	5	54.2	12	15.34	4	76.2	35	59.44	5	2.4
17.5	38.59	0	65.8	20	30.73	2	55.4	9	15.38	2	79.7	33	59.49	2	2.1
27.4	38.59	6	67.8	20	30.75	2	56.3	7	15.36	7	83.0	30	59.51	2	2.0
Oct. 7.4	38.53	10	69.8	20	30.73	5	57.0	5	15.29	13	86.0	28	59.49	4	2.2
17.4	38.43	15	71.8	19	30.68	7	57.5	3	15.16	18	88.8	25	59.45	7	2.5
27.4	38.28	17	73.7	16	30.61	9	57.8	0	14.98	21	91.3	20	59.38	10	2.9
Nov. 6.3	38.11	20	75.3	13	30.52	10	57.8	1	14.77	24	93.3	15	59.28	10	3.5
16.3	37.91	20	76.6	10	30.42	11	57.7	4	14.53	26	94.8	11	59.18	11	4.1
26.3	37.71	20	77.6	6	30.31	11	57.3	5	14.27	28	95.9	5	59.07	11	4.7
Dec. 6.3	37.51	20	78.2	1	30.20	11	56.8	6	13.99	29	96.4	0	58.96	10	5.4
16.2	37.31	18	78.3	3	30.09	10	56.2	8	13.70	28	96.4	6	58.86	10	6.0
26.2	37.13	17	78.0	7	29.99	9	55.4	8	13.42	26	95.8	11	58.76	9	6.6
36.2	36.96		77.3		29.90		54.6		13.16		94.7		58.67		7.1
Sec δ, Tan δ	1.432		−1.025		1.010		+0.145		1.821		+1.523		1.006		−0.114
Mean Place	33ˢ.109		86″.60		26ˢ.665		30″.12		11ˢ.138		56″.28		55ˢ.235		26″.81
$D'_{\psi}\alpha$, $D_{\omega}\alpha$	+0.01		+0.07		0.00		−0.01		−0.01		−0.10		0.00		+0.01
$D'_{\psi}\delta$, $D_{\omega}\delta$	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2

ean Solar Date.	**ψ Aquarii.** Mag. 4.5				**γ Tucanæ.** Mag. 4.1				**γ Piscium.** Mag. 3.8				**γ Sculptoris.** Mag. 4.5			
	Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m 23 11		° ′ − 9 32		h m 23 12		° ′ −58 41		h m 23 12		° ′ + 2 49		h m 23 14		° ′ −32 59	
	s		″		s		″		s		″		s		″	
an. 1.2	26.52	8	65.7	4	28.99	24	83.0	14	45.55	8	5.2	7	14.52	11	52.5	4
11.2	26.44	6	66.1	2	28.75	19	81.6	18	45.47	6	4.5	7	14.41	9	52.1	8
21.1	26.38	4	66.3	1	28.56	15	79.8	23	45.41	4	3.8	7	14.32	6	51.3	10
31.1	26.34	2	66.4	1	28.41	10	77.5	26	45.37	2	3.1	6	14.26	3	50.3	14
eb. 10.1	26.32	0	66.3	2	28.31	4	74.9	29	45.35	0	2.5	4	14.23	1	48.9	16
20.1	26.32	4	66.1	5	28.27	1	72.0	31	45.35	3	2.1	3	14.22	3	47.3	19
ar. 2.0	26.36	7	65.6	7	28.28	7	68.9	33	45.38	7	1.8	1	14.25	7	45.4	20
12.0	26.43	10	64.9	9	28.35	14	65.6	33	45.45	10	1.7	1	14.32	11	43.4	23
22.0	26.53	14	64.0	11	28.49	20	62.3	34	45.55	13	1.8	4	14.43	15	41.1	24
31.9	26.67	17	62.9	13	28.69	26	58.9	34	45.68	18	2.2	7	14.58	18	38.7	25
pr. 10.9	26.84	21	61.6	16	28.95	33	55.5	32	45.86	21	2.9	10	14.76	23	36.2	25
20.9	27.05	25	60.0	18	29.28	37	52.3	30	46.07	24	3.9	13	14.99	26	33.7	26
30.9	27.30	27	58.2	19	29.65	42	49.3	28	46.31	27	5.2	15	15.25	30	31.1	25
ay 10.8	27.57	30	56.3	20	30.07	46	46.5	24	46.58	30	6.7	17	15.55	33	28.6	24
20.8	27.87	31	54.3	20	30.53	50	44.1	21	46.88	31	8.4	19	15.88	35	26.2	22
30.8	28.18	32	52.3	21	31.03	52	42.0	17	47.19	32	10.3	20	16.23	36	24.0	20
une 9.8	28.50	33	50.2	20	31.55	52	40.3	13	47.51	32	12.3	21	16.59	36	22.0	18
19.7	28.83	32	48.2	20	32.07	51	39.0	7	47.83	32	14.4	21	16.95	36	20.2	14
29.7	29.15	31	46.2	18	32.58	50	38.3	3	48.15	30	16.5	21	17.31	35	18.8	11
uly 9.7	29.46	28	44.4	16	33.08	46	38.0	2	48.45	28	18.6	20	17.66	32	17.7	7
19.6	29.74	26	42.8	14	33.54	41	38.2	7	48.73	26	20.6	19	17.98	29	17.0	4
29.6	30.00	22	41.4	11	33.95	36	38.9	12	48.99	21	22.5	18	18.27	25	16.6	0
ug. 8.6	30.22	18	40.3	9	34.31	29	40.1	16	49.20	18	24.3	15	18.52	21	16.6	4
18.6	30.40	14	39.4	6	34.60	22	41.7	19	49.38	14	25.8	13	18.73	16	17.0	7
28.5	30.54	10	38.8	3	34.82	14	43.6	22	49.52	10	27.1	11	18.89	12	17.7	10
ept. 7.5	30.64	6	38.5	1	34.96	6	45.8	24	49.62	6	28.2	9	19.01	6	18.7	13
17.5	30.70	2	38.4	1	35.02	1	48.2	25	49.68	2	29.1	6	19.07	1	20.0	14
27.5	30.72	1	38.5	3	35.01	9	50.7	25	49.70	1	29.7	4	19.08	3	21.4	15
Oct. 7.4	30.71	5	38.8	5	34.92	16	53.2	24	49.69	4	30.1	1	19.05	6	22.9	16
17.4	30.66	7	39.3	6	34.76	22	55.6	21	49.65	7	30.2	0	18.99	10	24.5	15
27.4	30.59	9	39.9	6	34.54	26	57.7	18	49.58	8	30.2	1	18.89	13	26.0	14
Nov. 6.3	30.50	10	40.5	7	34.28	29	59.5	15	49.50	10	30.1	3	18.76	14	27.4	13
16.3	30.40	11	41.2	7	33.99	31	61.0	10	49.40	10	29.8	5	18.62	15	28.7	10
26.3	30.29	11	41.9	7	33.68	31	62.0	5	49.30	11	29.3	6	18.47	15	29.7	7
Dec. 6.3	30.18	11	42.6	6	33.37	31	62.5	0	49.19	10	28.7	6	18.32	14	30.4	4
16.2	30.07	10	43.2	5	33.06	29	62.5	6	49.09	10	28.1	7	18.18	14	30.8	1
26.2	29.97	9	43.7	5	32.77	26	61.9	11	48.99	9	27.4	7	18.04	12	30.9	2
36.2	29.88		44.2		32.51		60.8		48.90		26.7		17.92		30.7	
ec δ, Tan δ	1.014		−0.168		1.925		−1.645		1.001		+0.049		1.192		−0.649	
ean Place	$26^{s}.377$		$63''.17$		$28^{s}.514$		$68''.12$		$45^{s}.512$		$3''.66$		$14^{s}.195$		$43''.05$	
$_{\psi}\alpha$, $D_{\omega}\alpha$	0.00		+0.01		+0.01		+0.11		0.00		0.00		0.00		+0.04	
$_{\psi}\delta$, $D_{\omega}\delta$	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	o Cephei. Mag. 4.9				τ Pegasi. Mag. 4.6				b^1 Aquarii. Mag. 4.2				4 Cassiopeiæ. Mag. 5.2		
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Decli tion
	h m		° ′		h m		° ′		h m		° ′		h m		°
	23 15		+67 38		23 16		+23 16		23 18		−20 33		23 21		+61
	s		″		s		″		s		″		s		″
Jan. 1.2	5.78		66.0		25.47		38.0		30.72		59.2		1.93		76.4
11.2	5.34	44	64.7	13	25.37	10	36.8	12	30.63	9	59.2	0	1.60	33	75.1
21.1	4.95	39	63.0	17	25.28	9	35.5	13	30.56	7	59.0	2	1.30	30	73.4
31.1	4.62	33	60.7	23	25.21	7	34.0	15	30.50	6	58.6	4	1.05	25	71.2
Feb. 10.1	4.36	26	58.1	26	25.17	4	32.4	16	30.47	3	57.9	7	0.85	20	68.7
20.1	4.19	17	55.3	28	25.15	2	30.9	15	30.47	0	57.0	9	0.72	13	66.0
Mar. 2.0	4.12	7	52.3	30	25.17	2	29.5	14	30.50	3	55.9	11	0.66	6	63.2
12.0	4.15	3	49.4	29	25.23	6	28.2	13	30.56	6	54.5	14	0.69	3	60.3
22.0	4.29	14	46.5	29	25.32	9	27.2	10	30.65	9	52.9	16	0.80	11	57.6
31.9	4.53	24	43.9	26	25.46	14	26.4	8	30.79	14	51.1	18	1.00	20	55.1
Apr. 10.9	4.87	34	41.6	23	25.64	18	26.0	4	30.96	17	49.2	19	1.28	28	52.9
20.9	5.31	44	39.7	19	25.86	22	25.9	1	31.17	21	47.2	20	1.63	35	51.2
30.9	5.82	51	38.4	13	26.12	26	26.3	4	31.41	24	45.0	22	2.05	42	50.0
May 10.8	6.39	57	37.6	8	26.40	28	27.0	7	31.69	28	42.8	22	2.53	48	49.3
20.8	7.02	63	37.3	3	26.71	31	28.1	11	31.99	30	40.5	23	3.05	52	49.1
30.8	7.67	65	37.7	4	27.04	33	29.6	15	32.31	32	38.3	22	3.59	54	49.5
June 9.8	8.33	66	38.6	9	27.38	34	31.4	18	32.64	33	36.2	21	4.14	55	50.5
19.7	8.98	65	40.0	14	27.72	34	33.4	20	32.98	34	34.3	19	4.70	56	52.0
29.7	9.61	63	42.0	20	28.05	33	35.7	23	33.31	33	32.5	18	5.23	53	54.0
July 9.7	10.19	58	44.4	24	28.37	32	38.1	24	33.63	32	31.0	15	5.73	50	56.4
19.6	10.72	53	47.2	28	28.66	29	40.6	25	33.93	30	29.8	12	6.19	46	59.2
29.6	11.18	46	50.4	32	28.92	26	43.2	26	34.20	27	28.9	9	6.59	40	62.4
Aug. 8.6	11.57	39	53.8	34	29.15	23	45.8	26	34.44	24	28.3	6	6.93	34	65.7
18.6	11.87	30	57.4	36	29.33	18	48.3	25	34.64	20	28.0	3	7.20	27	69.3
28.5	12.08	21	61.1	37	29.47	14	50.7	24	34.79	15	28.0	0	7.41	21	72.9
Sept. 7.5	12.21	13	64.9	38	29.57	10	52.9	22	34.90	11	28.3	3	7.54	13	76.5
17.5	12.25	4	68.6	37	29.63	6	54.9	20	34.97	7	28.8	5	7.59	5	80.1
27.5	12.20	5	72.2	36	29.65	2	56.7	18	34.99	2	29.6	8	7.58	1	83.6
Oct. 7.4	12.07	13	75.6	34	29.64	1	58.3	16	34.97	2	30.5	9	7.50	8	86.8
17.4	11.86	21	78.7	31	29.59	5	59.6	13	34.93	4	31.5	10	7.35	15	89.8
27.4	11.58	28	81.6	29	29.52	7	60.6	10	34.85	8	32.6	11	7.15	20	92.5
Nov. 6.3	11.24	34	84.0	24	29.42	10	61.3	7	34.75	10	33.7	11	6.91	24	94.8
16.3	10.86	38	86.0	20	29.31	11	61.7	4	34.64	11	34.7	10	6.62	29	96.6
26.3	10.43	43	87.4	14	29.19	12	61.8	1	34.52	12	35.6	9	6.30	32	98.0
Dec. 6.3	9.97	46	88.3	9	29.07	12	61.6	2	34.40	12	36.4	8	5.96	34	98.8
16.2	9.51	46	88.5	2	28.94	13	61.1	5	34.28	12	37.0	6	5.61	35	99.0
26.2	9.04	47	88.2	3	28.82	12	60.3	8	34.16	12	37.3	3	5.26	35	98.7
36.2	8.59	45	87.3	9	28.71	11	59.3	10	34.06	10	37.5	2	4.92	34	97.8
Sec δ, Tan δ	2.630		+2.432		1.089		+0.430		1.068		−0.375		2.118		+1.86
Mean Place	$7^{s}.766$		$46''.70$		$25^{s}.654$		$29''.52$		$30^{s}.455$		$53''.33$		$3^{s}.291$		$57''.70$
$D'_\psi a$, $D_\omega a$	−0.01		−0.16		0.00		−0.03		0.00		+0.02		−0.01		−0.12
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	**υ Pegasi.** Mag. 4.6				**κ Piscium.** Mag. 4.9				**θ Piscium.** Mag. 4.4				**70 Pegasi.** Mag. 4.7			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	23 21		+22 56		23 22		+ 0 47		23 23		+ 5 54		23 24		+12 17	
	s		″		s		″		s		″		s		″	
an. 1.2	7.94		17.9		34.62		25.9		39.41		46.2		51.28		34.6	
11.2	7.84	10	16.8	11	34.54	8	25.2	7	39.32	9	45.4	8	51.19	9	33.7	9
21.1	7.75	9	15.5	13	34.47	7	24.6	6	39.25	7	44.6	8	51.12	7	32.7	10
31.1	7.68	7	14.0	15	34.42	5	24.0	6	39.19	6	43.8	8	51.06	6	31.7	10
eb. 10.1	7.63	5	12.5	15	34.39	3	23.6	4	39.16	3	43.1	7	51.02	4	30.6	11
20.1	7.61	2	11.0	15	34.38	1	23.2	4	39.15	1	42.5	6	51.00	2	29.7	9
ar. 2.0	7.62	1	9.6	14	34.40	2	23.1	1	39.17	2	42.0	5	51.02	2	28.8	9
12.0	7.68	6	8.4	12	34.46	6	23.1	0	39.22	5	41.8	2	51.07	5	28.2	6
22.0	7.77	9	7.3	11	34.55	9	23.4	3	39.31	9	41.7	1	51.16	9	27.8	4
31.9	7.90	13	6.6	7	34.67	12	23.9	5	39.43	12	42.0	3	51.28	12	27.6	2
pr. 10.9	8.08	18	6.2	4	34.84	17	24.7	8	39.59	16	42.5	5	51.44	16	27.8	2
20.9	8.29	21	6.1	1	35.04	20	25.8	11	39.79	20	43.3	8	51.65	21	28.3	5
30.9	8.54	25	6.5	4	35.27	23	27.1	13	40.03	24	44.4	11	51.88	23	29.1	8
ay 10.8	8.82	28	7.2	7	35.53	26	28.7	16	40.29	26	45.8	14	52.15	27	30.2	11
20.8	9.13	31	8.3	11	35.82	29	30.4	17	40.58	29	47.4	16	52.45	30	31.6	14
30.8	9.46	33	9.7	14	36.13	31	32.4	20	40.89	31	49.2	18	52.76	31	33.3	17
June 9.8	9.80	34	11.5	18	36.45	32	34.4	20	41.21	32	51.2	20	53.08	32	35.2	19
19.7	10.14	34	13.6	21	36.77	32	36.5	21	41.53	32	53.3	21	53.41	33	37.3	21
29.7	10.47	33	15.8	22	37.09	32	38.6	21	41.85	32	55.4	21	53.73	32	39.5	22
July 9.7	10.79	32	18.2	24	37.40	31	40.6	20	42.16	31	57.6	22	54.04	31	41.8	23
19.6	11.08	29	20.7	25	37.68	28	42.6	20	42.44	28	59.7	21	54.33	29	44.0	22
29.6	11.35	27	23.3	26	37.94	26	44.4	18	42.70	26	61.7	20	54.59	26	46.3	23
Aug. 8.6	11.58	23	25.8	25	38.16	22	46.1	17	42.93	23	63.6	19	54.82	23	48.4	21
18.6	11.77	19	28.3	25	38.35	19	47.5	14	43.11	18	65.3	17	55.01	19	50.4	20
28.5	11.92	15	30.6	23	38.50	15	48.7	12	43.26	15	66.8	15	55.16	15	52.2	18
Sept. 7.5	12.02	10	32.8	22	38.61	11	49.7	10	43.37	11	68.0	12	55.27	11	53.9	17
17.5	12.09	7	34.8	20	38.68	7	50.4	7	43.44	7	69.0	10	55.34	7	55.3	14
27.5	12.11	2	36.6	18	38.71	3	50.9	5	43.47	3	69.8	8	55.37	3	56.5	12
Oct. 7.4	12.10	1	38.2	16	38.70	1	51.2	3	43.46	1	70.4	6	55.36	1	57.4	9
17.4	12.06	4	39.5	13	38.67	3	51.2	0	43.43	3	70.8	4	55.33	3	58.1	7
27.4	11.99	7	40.5	10	38.61	6	51.1	1	43.37	6	70.9	1	55.27	6	58.6	5
Nov. 6.3	11.90	9	41.2	7	38.53	8	50.8	3	43.29	8	70.9	0	55.19	8	58.8	2
16.3	11.80	10	41.6	4	38.44	9	50.4	4	43.20	9	70.7	2	55.10	9	58.8	0
26.3	11.68	12	41.7	1	38.34	10	49.9	5	43.10	10	70.3	4	55.00	10	58.6	2
Dec. 6.3	11.56	12	41.5	2	38.23	11	49.4	5	42.99	11	69.8	5	54.89	11	58.3	3
16.2	11.43	13	41.1	4	38.12	11	48.7	7	42.89	10	69.2	6	54.78	11	57.7	6
26.2	11.31	12	40.3	8	38.02	10	48.1	6	42.78	11	68.5	7	54.67	11	57.0	7
36.2	11.20	11	39.3	10	37.93	9	47.4	7	42.69	9	67.7	8	54.57	10	56.1	9
Sec δ, Tan δ	1.086		+0.423		1.000		+0.014		1.005		+0.104		1.023		+0.218	
ean Place	8ˢ.086		9″.35		34ˢ.509		24″.69		39ˢ.334		43″.24		51ˢ.274		29″.41	
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		−0.03		0.00		0.00		0.00		−0.01		0.00		−0.01	
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.2		+0.4		−0.2		+0.4		−0.2		+0.4		−0.2	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	β Sculptoris. Mag. 4.5				72 Pegasi (*mean*). Mag. 5.2				λ Andromedæ. Mag. 4.0				ι Andromedæ. Mag. 4.3	
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.	Declination N.
	h m		° ′		h m		° ′		h m		° ′		h m	°
	23 28		−38 16		23 29		+30 51		23 33		+45 59		23 33	+42 4
	s		″		s		″		s		″		s	″
Jan. 1.2	25.46		89.7		43.77		33.5		23.45		67.1		57.37	65.8
11.2	25.33	13	89.2	5	43.64	13	32.4	11	23.27	18	65.9	12	57.20	64.6
21.1	25.22	11	88.3	9	43.53	11	31.0	14	23.10	17	64.3	16	57.05	63.1
31.1	25.13	9	87.1	12	43.44	9	29.4	16	22.95	15	62.4	19	56.91	61.3
Feb. 10.1	25.07	6	85.5	16	43.38	6	27.6	18	22.84	11	60.2	22	56.81	59.2
20.1	25.04	3	83.6	19	43.34	4	25.8	18	22.77	7	57.9	23	56.74	56.9
Mar. 2.0	25.05	1	81.5	21	43.34	0	24.0	18	22.74	3	55.5	24	56.72	54.7
12.0	25.10	5	79.1	24	43.38	4	22.4	16	22.77	3	53.2	23	56.75	52.5
22.0	25.19	9	76.6	25	43.46	8	20.9	15	22.85	8	51.0	22	56.83	50.4
Apr. 1.0	25.32	13	73.9	27	43.59	13	19.7	12	22.99	14	49.0	20	56.96	48.6
10.9	25.50	18	71.1	28	43.76	17	18.8	9	23.18	19	47.4	16	57.15	47.2
20.9	25.72	22	68.4	27	43.98	22	18.3	5	23.44	26	46.2	12	57.39	46.1
30.9	25.98	26	65.6	28	44.24	26	18.3	0	23.74	30	45.5	7	57.68	45.5
May 10.8	26.28	30	62.9	27	44.53	29	18.6	3	24.08	34	45.2	3	58.01	45.3
20.8	26.61	33	60.4	25	44.86	33	19.4	8	24.45	37	45.4	2	58.37	45.7
30.8	26.97	36	58.0	24	45.20	34	20.6	12	24.85	40	46.1	7	58.75	46.5
June 9.8	27.34	37	55.9	21	45.55	35	22.2	16	25.26	41	47.3	12	59.15	47.8
19.7	27.72	38	54.1	18	45.91	36	24.1	19	25.68	42	49.0	17	59.55	49.5
29.7	28.10	38	52.7	14	46.26	35	26.3	22	26.09	41	51.0	20	59.94	51.6
July 9.7	28.47	37	51.6	11	46.60	34	28.7	24	26.47	38	53.4	24	60.31	54.0
19.7	28.82	35	51.0	6	46.91	31	31.3	26	26.83	36	56.1	27	60.66	56.7
29.6	29.13	31	50.7	3	47.19	28	34.0	27	27.16	33	59.0	29	60.97	59.6
Aug. 8.6	29.41	28	50.9	2	47.43	24	36.8	28	27.44	28	62.1	31	61.24	62.6
18.6	29.64	23	51.5	6	47.64	21	39.6	28	27.67	23	65.3	32	61.47	65.7
28.5	29.82	18	52.4	9	47.80	16	42.2	26	27.86	19	68.5	32	61.65	68.8
Sept. 7.5	29.96	14	53.7	13	47.92	12	44.8	26	27.99	13	71.7	32	61.78	71.9
17.5	30.04	8	55.2	15	47.99	7	47.3	25	28.07	8	74.7	30	61.86	74.8
27.5	30.07	3	56.9	17	48.02	3	49.5	22	28.10	3	77.6	29	61.89	77.6
Oct. 7.4	30.05	2	58.7	18	48.02	0	51.5	20	28.09	1	80.4	28	61.88	80.2
17.4	29.98	7	60.5	18	47.98	4	53.2	17	28.03	6	82.8	24	61.83	82.5
27.4	29.89	9	62.3	18	47.91	7	54.6	14	27.93	10	84.9	21	61.75	84.5
Nov. 6.4	29.76	13	64.0	17	47.82	9	55.7	11	27.81	12	86.7	18	61.63	86.2
16.3	29.61	15	65.4	14	47.70	12	56.5	8	27.66	15	88.1	14	61.49	87.5
26.3	29.45	16	66.6	12	47.58	12	56.9	4	27.48	18	89.0	9	61.33	88.3
Dec. 6.3	29.28	17	67.4	8	47.44	14	56.9	0	27.29	19	89.5	5	61.16	88.7
16.2	29.11	17	67.9	5	47.30	14	56.6	3	27.09	20	89.5	0	60.98	88.7
26.2	28.96	15	68.0	1	47.16	14	56.0	6	26.89	20	89.1	4	60.79	88.2
36.2	28.81	15	67.7	3	47.03	13	55.0	10	26.70	19	88.1	10	60.62	87.3
Sec δ, Tan δ	1.274		−0.789		1.165		+0.598		1.440		+1.036		1.363	+0.9
Mean Place	25ˢ.007		79″.13		43ˢ.986		22″.14		23ˢ.972		51″.23		57ˢ.797	50″.7
$D'_\psi \alpha$, $D_\omega \alpha$	0.00		+0.05		0.00		−0.04		0.00		−0.07		0.00	−0.0
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.1		+0.4		−0.1		+0.4		−0.1		+0.4	−0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι Piscium. Mag. 4.3				γ Cephei. Mag. 3.4				κ Andromedæ. Mag. 4.3				ω² Aquarii. Mag. 4.6			
	Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.	
	h m		° ′		h m		° ′		h m		° ′		h m		° ′	
	23 35		+ 5 9		23 35		+77 9		23 36		+43 51		23 38		−15 0	
	s		″		s		″		s		″		s		″	
an. 1.2	34.80	9	59.0	8	47.65	85	50.4	9	12.60	17	62.8	12	19.25	9	57.1	3
11.2	34.71	8	58.2	8	46.80	79	49.5	14	12.43	16	61.6	15	19.16	8	57.4	0
21.1	34.63	6	57.4	7	46.01	70	48.1	19	12.27	14	60.1	18	19.08	7	57.4	1
31.1	34.57	4	56.7	7	45.31	57	46.2	24	12.13	11	58.3	21	19.01	5	57.3	3
Feb. 10.1	34.53	2	56.0	6	44.74	43	43.8	27	12.02	7	56.2	23	18.96	2	57.0	6
20.1	34.51	1	55.4	4	44.31	27	41.1	30	11.95	3	53.9	23	18.94	1	56.4	8
Mar. 2.0	34.52	4	55.0	2	44.04	8	38.1	30	11.92	3	51.6	22	18.95	4	55.6	10
12.0	34.56	8	54.8	0	43.96	11	35.1	31	11.95	8	49.4	21	18.99	7	54.6	12
22.0	34.64	11	54.8	2	44.07	28	32.0	29	12.03	13	47.3	19	19.06	11	53.4	15
Apr. 1.0	34.75	16	55.0	6	44.35	46	29.1	26	12.16	19	45.4	15	19.17	15	51.9	17
10.9	34.91	19	55.6	8	44.81	63	26.5	23	12.35	24	43.9	11	19.32	19	50.2	18
20.9	35.10	22	56.4	11	45.44	77	24.2	18	12.59	29	42.8	7	19.51	23	48.4	20
30.9	35.32	26	57.5	14	46.21	88	22.4	13	12.88	33	42.1	2	19.74	25	46.4	22
May 10.8	35.58	28	58.9	16	47.09	97	21.1	7	13.21	36	41.9	3	19.99	29	44.2	22
20.8	35.86	31	60.5	18	48.06	103	20.4	2	13.57	39	42.2	7	20.28	31	42.0	22
30.8	36.17	32	62.3	19	49.09	106	20.2	4	13.96	40	42.9	13	20.59	32	39.8	21
June 9.8	36.49	32	64.2	21	50.15	105	20.6	10	14.36	41	44.2	16	20.91	33	37.7	21
19.7	36.81	32	66.3	21	51.20	102	21.6	15	14.77	39	45.8	21	21.24	33	35.6	19
29.7	37.13	31	68.4	22	52.22	97	23.1	21	15.16	38	47.9	24	21.57	32	33.7	18
July 9.7	37.44	29	70.6	20	53.19	89	25.2	25	15.54	36	50.3	27	21.89	30	31.9	15
19.7	37.73	27	72.6	20	54.08	79	27.7	29	15.90	32	53.0	29	22.19	27	30.4	12
29.6	38.00	23	74.6	18	54.87	68	30.6	32	16.22	27	55.9	30	22.46	25	29.2	10
Aug. 8.6	38.23	20	76.4	17	55.55	54	33.8	35	16.49	23	58.9	31	22.71	21	28.2	6
18.6	38.43	16	78.1	14	56.09	41	37.3	37	16.72	19	62.0	32	22.92	17	27.6	4
28.5	38.59	13	79.5	12	56.50	26	41.0	38	16.91	13	65.2	31	23.09	12	27.2	0
Sept. 7.5	38.72	8	80.7	10	56.76	12	44.8	39	17.04	9	68.3	30	23.21	9	27.2	2
17.5	38.80	4	81.7	8	56.88	3	48.7	38	17.13	3	71.3	28	23.30	4	27.4	4
27.5	38.84	1	82.5	5	56.85	17	52.5	37	17.16	1	74.1	26	23.34	1	27.8	7
Oct. 7.4	38.85	2	83.0	3	56.68	31	56.2	35	17.15	5	76.7	24	23.35	2	28.5	8
17.4	38.83	5	83.3	1	56.37	44	59.7	32	17.10	8	79.1	21	23.33	6	29.3	9
27.4	38.78	7	83.4	1	55.93	55	62.9	29	17.02	12	81.2	17	23.27	7	30.2	10
Nov. 6.4	38.71	8	83.3	2	55.38	66	65.8	24	16.90	14	82.9	13	23.20	10	31.2	9
16.3	38.63	10	83.1	4	54.72	75	68.2	20	16.76	16	84.2	9	23.10	10	32.1	9
26.3	38.53	10	82.7	6	53.97	82	70.2	14	16.60	18	85.1	5	23.00	11	33.0	8
Dec. 6.3	38.43	10	82.1	6	53.15	85	71.6	8	16.42	18	85.6	0	22.89	12	33.8	7
16.2	38.33	10	81.5	7	52.30	88	72.4	2	16.24	19	85.6	5	22.77	10	34.5	5
26.2	38.23	10	80.8	7	51.42	87	72.6	5	16.05	18	85.1	9	22.67	11	35.0	4
36.2	38.13		80.1		50.55		72.1		15.87		84.2		22.56		35.4	
Sec δ, Tan δ	1.004		+0.090		4.501		+4.388		1.387		+0.961		1.035		−0.268	
Mean Place	34ˢ.656		55″.78		50ˢ.979		28″.64		13ˢ.039		47″.31		18ˢ.918		53″.55	
$D'_\psi\alpha$, $D_\omega\alpha$	0.00		−0.01		−0.01		−0.29		0.00		−0.06		0.00		+0.02	
$D_\psi\delta$, $D_\omega\delta$	+0.4		−0.1		+0.4		−0.1		+0.4		−0.1		+0.4		−0.1	

FOR THE UPPER TRANSIT AT WASHINGTON.

Mean Solar Date.	ι^1 Aquarii. Mag. 5.3				ψ Andromedæ. Mag. 5.1				41 H. Cephei. Mag. 5.0				δ Sculptoris. Mag. 4.6		
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination S.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	23 39		−18 44		23 41		+45 56		23 43		+67 19		23 44		−28
	s		″		s		″		s		″		s		″
Jan. 1.2	48.04		60.6		48.60		69.9		48.79		84.8		30.46		70.2
11.2	47.94	10	60.8	2	48.41	19	68.8	11	48.35	44	83.9	9	30.34	12	70.1
21.2	47.86	8	60.7	1	48.23	18	67.3	15	47.94	41	82.5	14	30.24	10	69.7
31.1	47.79	7	60.4	3	48.08	15	65.5	18	47.57	37	80.6	19	30.16	8	69.0
Feb. 10.1	47.74	5	59.9	5	47.96	12	63.4	21	47.27	30	78.2	24	30.10	6	68.0
20.1	47.71	3	59.1	8	47.88	8	61.2	22	47.04	23	75.6	26	30.06	4	66.7
Mar. 2.0	47.72	1	58.1	10	47.84	4	58.8	24	46.90	14	72.8	28	30.06	0	65.1
12.0	47.76	4	56.8	13	47.86	2	56.5	23	46.87	3	69.9	29	30.09	3	63.3
22.0	47.83	7	55.3	15	47.93	7	54.3	22	46.94	7	67.0	29	30.15	6	61.2
Apr. 1.0	47.94	11	53.7	16	48.05	12	52.4	19	47.11	17	64.3	27	30.26	11	59.0
10.9	48.09	15	51.8	19	48.24	19	50.7	17	47.39	28	61.8	25	30.41	15	56.7
20.9	48.28	19	49.7	21	48.48	24	49.5	12	47.77	38	59.7	21	30.60	19	54.2
30.9	48.50	22	47.6	21	48.77	29	48.6	9	48.23	46	58.1	16	30.83	23	51.6
May 10.9	48.76	26	45.3	23	49.11	34	48.3	3	48.77	54	57.0	11	31.09	26	49.1
20.8	49.05	29	43.0	23	49.48	37	48.5	2	49.36	59	56.4	6	31.39	30	46.6
30.8	49.36	31	40.8	22	49.87	39	49.1	6	49.99	63	56.4	0	31.71	32	44.2
June 9.8	49.68	32	38.6	22	50.28	41	50.2	11	50.65	66	57.0	6	32.05	34	42.0
19.7	50.01	33	36.6	20	50.70	42	51.8	16	51.31	66	58.1	11	32.40	35	40.0
29.7	50.35	34	34.7	19	51.11	41	53.8	20	51.96	65	59.7	16	32.76	36	38.2
July 9.7	50.67	32	33.0	17	51.50	39	56.2	24	52.58	62	61.8	21	33.10	34	36.8
19.7	50.98	31	31.6	14	51.87	37	58.8	26	53.15	57	64.3	25	33.42	32	35.7
29.6	51.26	28	30.5	11	52.20	33	61.7	29	53.66	51	67.2	29	33.72	30	34.9
Aug. 8.6	51.51	25	29.7	8	52.49	29	64.7	30	54.11	45	70.4	32	33.99	27	34.6
18.6	51.72	21	29.2	5	52.74	25	67.8	31	54.48	37	73.9	35	34.22	23	34.6
28.6	51.89	17	29.1	1	52.94	20	71.0	32	54.78	30	77.5	36	34.40	18	35.0
Sept. 7.5	52.02	13	29.3	2	53.08	14	74.2	32	54.98	20	81.2	37	34.54	14	35.7
17.5	52.11	9	29.7	4	53.17	9	77.3	31	55.10	12	84.9	37	34.64	10	36.7
27.5	52.16	5	30.4	7	53.22	5	80.2	29	55.14	4	88.5	36	34.69	5	37.9
Oct. 7.4	52.17	1	31.2	8	53.22	0	83.0	28	55.09	5	92.0	35	34.70	1	39.3
17.4	52.14	3	32.2	10	53.17	5	85.4	24	54.96	13	95.3	33	34.67	3	40.8
27.4	52.08	6	33.3	11	53.09	8	87.6	22	54.76	20	98.3	30	34.60	7	42.3
Nov. 6.4	52.00	8	34.4	11	52.97	12	89.5	19	54.49	27	101.0	27	34.51	9	43.8
16.3	51.91	9	35.5	11	52.82	15	90.9	14	54.17	32	103.2	22	34.40	11	45.1
26.3	51.80	11	36.5	10	52.66	16	91.9	10	53.79	38	105.0	18	34.27	13	46.3
Dec. 6.3	51.68	12	37.3	8	52.47	19	92.5	6	53.38	41	106.2	12	34.14	13	47.3
16.3	51.56	12	38.0	7	52.28	19	92.6	1	52.94	44	106.9	7	34.00	14	48.0
26.2	51.45	11	38.5	5	52.08	20	92.3	3	52.48	46	106.9	0	33.87	13	48.4
36.2	51.34	11	38.8	3	51.88	20	91.4	9	52.03	45	106.4	5	33.74	13	48.5
Sec δ, Tan δ	1.056		−0.339		1.438		+1.034		2.596		+2.395		1.139		−0.545
Mean Place	$47^{s}.668$		$55''.85$		$49^{s}.039$		$53''.64$		$50^{s}.271$		$63''.92$		$29^{s}.985$		$62''.61$
$D'_{\psi} \alpha$, $D_{\omega} \alpha$	0.00		+0.02		0.00		−0.07		0.00		−0.16		0.00		+0.04
$D_{\psi} \delta$, $D_{\omega} \delta$	+0.4		−0.1		+0.4		−0.1		+0.4		−0.1		+0.4		−0.1

FOR THE UPPER TRANSIT AT WASHINGTON.

ean Solar Date.	γ^1 Octantis. Mag. 5.1				ϕ Pegasi. Mag. 5.2				ρ Cassiopeiæ. Mag. 4.8				Groombridge 4163. Mag. 6.6			
	Right Ascension.		Declination S.		Right Ascension.		Declination N.		Right Ascension.		Declination N.		Right Ascension.		Declination N.	
	h m 23 47		° ′ −82 28		h m 23 48		° ′ +18 38		h m 23 50		° ′ +57 1		h m 23 50		° ′ +73 56	
	s		″		s		″		s		″		s		″	
an. 1.2	11.25	143	105.1	17	9.76	10	61.7	9	7.02	28	54.7	9	38.52	67	36.3	6
11.2	9.82	130	103.4	23	9.66	10	60.8	11	6.74	26	53.8	14	37.85	63	35.7	13
21.2	8.52	112	101.1	27	9.56	8	59.7	12	6.48	24	52.4	19	37.22	56	34.4	18
31.1	7.40	91	98.4	32	9.48	7	58.5	12	6.24	19	50.5	22	36.66	47	32.6	23
eb. 10.1	6.49	69	95.2	35	9.41	4	57.3	12	6.05	14	48.3	24	36.19	37	30.3	26
20.1	5.80	45	91.7	37	9.37	1	56.1	11	5.91	9	45.9	26	35.82	24	27.7	29
ar. 2.0	5.35	19	88.0	38	9.36	3	55.0	10	5.82	1	43.3	27	35.58	10	24.8	30
12.0	5.16	5	84.2	40	9.39	6	54.0	8	5.81	6	40.6	26	35.48	4	21.8	30
22.0	5.21	31	80.2	39	9.45	10	53.2	5	5.87	13	38.0	24	35.52	20	18.8	28
pr. 1.0	5.52	55	76.3	38	9.55	15	52.7	3	6.00	20	35.6	22	35.72	34	16.0	27
10.9	6.07	78	72.5	36	9.70	19	52.4	1	6.20	28	33.4	17	36.06	48	13.3	23
20.9	6.85	100	68.9	33	9.89	22	52.5	4	6.48	34	31.7	13	36.54	60	11.0	19
30.9	7.85	121	65.6	30	10.11	27	52.9	8	6.82	40	30.4	9	37.14	70	9.1	13
May 10.9	9.06	136	62.6	26	10.38	29	53.7	11	7.22	44	29.5	3	37.84	78	7.8	9
20.8	10.42	150	60.0	22	10.67	31	54.8	14	7.66	48	29.2	2	38.62	84	6.9	3
30.8	11.92	161	57.8	17	10.98	33	56.2	17	8.14	50	29.4	8	39.46	86	6.6	3
June 9.8	13.53	167	56.1	11	11.31	33	57.9	20	8.64	50	30.2	12	40.32	88	6.9	9
19.7	15.20	170	55.0	6	11.64	33	59.9	21	9.14	49	31.4	18	41.20	86	7.8	14
29.7	16.90	167	54.4	1	11.97	33	62.0	23	9.63	48	33.2	21	42.06	83	9.2	19
July 9.7	18.57	160	54.3	6	12.30	30	64.3	23	10.11	44	35.3	26	42.89	77	11.1	24
19.7	20.17	148	54.9	11	12.60	28	66.6	24	10.55	41	37.9	29	43.66	70	13.5	27
29.6	21.65	131	56.0	16	12.88	25	69.0	23	10.96	35	40.8	31	44.36	60	16.2	32
Aug. 8.6	22.96	110	57.6	20	13.13	21	71.3	23	11.31	30	43.9	33	44.96	51	19.4	34
18.6	24.06	86	59.6	25	13.34	18	73.6	21	11.61	25	47.2	34	45.47	40	22.8	36
28.6	24.92	58	62.1	27	13.52	13	75.7	19	11.86	18	50.6	35	45.87	28	26.4	37
Sept. 7.5	25.50	28	64.8	30	13.65	9	77.6	18	12.04	11	54.1	34	46.15	17	30.1	38
17.5	25.78	2	67.8	30	13.74	6	79.4	16	12.15	6	57.5	34	46.32	5	33.9	38
27.5	25.76	33	70.8	30	13.80	2	81.0	13	12.21	1	60.9	32	46.37	6	37.7	37
Oct. 7.4	25.43	63	73.8	28	13.82	1	82.3	11	12.20	5	64.1	29	46.31	18	41.4	35
17.4	24.80	90	76.6	26	13.81	4	83.4	8	12.15	11	67.0	27	46.13	28	44.9	32
27.4	23.90	114	79.2	22	13.77	7	84.2	6	12.04	16	69.7	24	45.85	38	48.1	29
Nov. 6.4	22.76	134	81.4	17	13.70	8	84.8	3	11.88	20	72.1	19	45.47	47	51.0	25
16.3	21.42	148	83.1	11	13.62	9	85.1	1	11.68	23	74.0	15	45.00	55	53.5	21
26.3	19.94	158	84.2	6	13.53	11	85.2	2	11.45	25	75.5	10	44.45	60	55.6	15
Dec. 6.3	18.36	161	84.8	1	13.42	11	85.0	4	11.20	28	76.5	5	43.85	65	57.1	9
16.3	16.75	159	84.7	7	13.31	12	84.6	6	10.92	28	77.0	1	43.20	68	58.0	3
26.2	15.16	152	84.0	13	13.19	11	84.0	8	10.64	28	76.9	6	42.52	67	58.3	3
36.2	13.64		82.7		13.08		83.2		10.36		76.3		41.85		58.0	
Sec δ, Tan δ	7.650		−7.584		1.055		+0.338		1.838		+1.542		3.615		+3.474	
ean Place	$9^s.199$		88″.43		$9^s.684$		53″.44		$7^s.747$		35″.42		$40^s.703$		14″.18	
$D'_\psi \alpha$, $D_\omega \alpha$	+0.01		+0.51		0.00		−0.02		0.00		−0.10		0.00		−0.23	
$D_\psi \delta$, $D_\omega \delta$	+0.4		−0.1		+0.4		−0.1		+0.4		0.0		+0.4		0.0	

Mean Solar Date.	ω Piscium. Mag. 4.0				ε Tucanæ. Mag. 4.7				30 Piscium. Mag. 4.7				2 Ceti. Mag. 4.6		
	Right Ascension.		Declination N.		Right Ascension.		Declination S.		Right Ascension.		Declination S.		Right Ascension.		Declination S.
	h m		° ′		h m		° ′		h m		° ′		h m		°
	23 54		+ 6 23		23 55		−66 2		23 57		− 6 28		23 59		−17 4
	s		″		s		″		s		″		s		″
Jan. 1.2	56.99		38.3		31.51		74.5		36.44		71.4		23.67		37.2
11.2	56.89	10	37.6	7	31.12	39	73.4	11	36.34	10	71.9	5	23.56	11	37.4
21.2	56.80	9	36.8	8	30.76	36	71.7	17	36.25	9	72.3	4	23.46	10	37.5
31.1	56.73	7	36.1	7	30.45	31	69.5	22	36.18	7	72.5	2	23.38	8	37.3
Feb. 10.1	56.67	6	35.4	7	30.20	25	66.9	26	36.12	6	72.6	1	23.32	6	36.8
20.1	56.63	4	34.8	6	30.01	19	63.9	30	36.08	4	72.5	1	23.27	5	36.1
Mar. 2.1	56.62	1	34.3	5	29.89	12	60.7	32	36.07	1	72.2	3	23.26	1	35.2
12.0	56.64	2	34.1	2	29.85	4	57.2	35	36.09	2	71.7	5	23.27	1	34.0
22.0	56.70	6	34.0	1	29.89	4	53.6	36	36.14	5	71.0	7	23.32	5	32.6
Apr. 1.0	56.79	9	34.2	2	30.01	12	49.9	37	36.23	9	70.0	10	23.41	9	31.0
10.9	56.93	14	34.6	4	30.22	21	46.2	37	36.36	13	68.8	12	23.54	13	29.1
20.9	57.10	17	35.4	8	30.50	28	42.6	36	36.53	17	67.4	14	23.71	17	27.1
30.9	57.31	21	36.4	10	30.86	36	39.2	34	36.73	20	65.8	16	23.91	20	25.0
May 10.9	57.56	25	37.7	13	31.29	43	36.1	31	36.97	24	63.9	19	24.16	25	22.7
20.8	57.83	27	39.2	15	31.79	50	33.2	29	37.24	27	62.0	19	24.43	27	20.4
30.8	58.13	30	41.0	18	32.34	55	30.7	25	37.54	30	59.9	21	24.73	30	18.1
June 9.8	58.45	32	42.9	19	32.92	58	28.6	21	37.85	31	57.8	21	25.05	32	15.8
19.8	58.77	32	44.9	20	33.53	61	27.0	16	38.17	32	55.6	22	25.38	33	13.7
29.7	59.09	32	47.0	21	34.16	63	25.9	11	38.49	32	53.6	20	25.71	33	11.7
July 9.7	59.41	32	49.2	22	34.77	61	25.4	5	38.81	32	51.6	20	26.04	33	9.9
19.7	59.71	30	51.3	21	35.36	59	25.4	0	39.11	30	49.8	18	26.35	31	8.4
29.6	59.99	28	53.3	20	35.91	55	25.9	5	39.40	29	48.2	16	26.64	29	7.2
Aug. 8.6	60.23	24	55.1	18	36.41	50	26.9	10	39.65	25	46.8	14	26.90	26	6.3
18.6	60.45	22	56.9	18	36.84	43	28.5	16	39.87	22	45.7	11	27.13	23	5.7
28.6	60.63	18	58.4	15	37.18	34	30.4	19	40.05	18	44.9	8	27.32	19	5.5
Sept. 7.5	60.77	14	59.7	13	37.43	25	32.7	23	40.19	14	44.3	6	27.47	15	5.6
17.5	60.87	10	60.7	10	37.58	15	35.3	26	40.29	10	44.0	3	27.57	10	5.9
27.5	60.93	6	61.6	9	37.64	6	38.1	28	40.36	7	43.9	1	27.64	7	6.6
Oct. 7.5	60.96	3	62.2	6	37.60	4	40.9	28	40.39	3	44.1	2	27.67	3	7.4
17.4	60.95	1	62.5	3	37.46	14	43.7	28	40.38	1	44.5	4	27.66	1	8.4
27.4	60.92	3	62.7	2	37.24	22	46.3	26	40.35	3	45.0	5	27.62	4	9.5
Nov. 6.4	60.87	5	62.7	0	36.94	30	48.6	23	40.30	5	45.6	6	27.56	6	10.6
16.3	60.80	7	62.5	2	36.59	35	50.5	19	40.22	8	46.4	8	27.47	9	11.7
26.3	60.71	9	62.1	4	36.19	40	52.0	15	40.13	9	47.1	7	27.37	10	12.8
Dec. 6.3	60.61	10	61.7	4	35.77	42	52.9	9	40.04	9	47.9	8	27.27	10	13.7
16.3	60.51	10	61.1	6	35.33	44	53.3	4	39.93	11	48.6	7	27.15	12	14.5
26.2	60.41	10	60.5	6	34.90	43	53.1	2	39.83	10	49.2	6	27.04	11	15.1
36.2	60.31	10	59.7	8	34.48	42	52.3	8	39.73	10	49.8	6	26.93	11	15.5
Sec δ, Tan δ	1.006		+0.112		2.463		−2.252		1.006		−0.114		1.050		−0.321
Mean Place	56^{s}.738		34″.05		30^{s}.465		59″.09		36^{s}.059		71″.22		23^{s}.188		33″.28
D′ψ a, Dω a	0.00		−0.01		0.00		+0.15		0.00		+0.01		0.00		+0.02
Dψ δ, Dω δ	+0.4		0.0		+0.4		0.0		+0.4		0.0		+0.4		0.0

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Octantis (G.). Mag. 5.6			**31 Mensæ** (G.). Mag. 6.2			**7 Octantis** (G.). Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
n.	1 42	−85 12	Jan.	5 46	−84 49	Jan.	7 17	−86 53	Jan.	9 9	−85 19	Jan.	10 59	−84 7
	s	″		s	″		s	″		s	″		s	″
.3	19.08	10.94	0.5	51.11	46.43	0.5	18.95	44.33	0.6	21.52	13.33	0.7	56.85	55.11
.3	18.81	10.93	1.5	50.98	46.74	1.5	18.88	44.68	1.6	21.62	13.67	1.7	57.02	55.38
.3	18.55	10.89	2.5	50.84	47.02	2.5	18.81	45.02	2.6	21.72	14.01	2.7	57.18	55.63
.3	18.30	10.88	3.5	50.72	47.29	3.5	18.74	45.34	3.6	21.81	14.33	3.7	57.34	55.86
.3	18.07	10.88	4.5	50.61	47.57	4.5	18.70	45.66	4.6	21.90	14.63	4.7	57.51	56.08
.3	17.85	10.88	5.5	50.51	47.86	5.5	18.67	45.98	5.6	22.01	14.94	5.7	57.67	56.30
.3	17.61	10.90	6.4	50.41	48.16	6.5	18.66	46.31	6.6	22.13	15.25	6.7	57.85	56.52
.3	17.34	10.93	7.4	50.31	48.48	7.5	18.64	46.67	7.6	22.26	15.58	7.7	58.05	56.75
.3	17.06	10.96	8.4	50.20	48.83	8.5	18.61	47.05	8.6	22.40	15.94	8.7	58.26	57.00
.3	16.75	10.97	9.4	50.07	49.19	9.5	18.57	47.46	9.6	22.52	16.32	9.7	58.46	57.28
.3	16.44	10.96	10.4	49.92	49.54	10.5	18.49	47.87	10.6	22.64	16.72	10.7	58.66	57.59
.3	16.12	10.92	11.4	49.74	49.88	11.5	18.38	48.28	11.6	22.73	17.13	11.7	58.85	57.92
2.3	15.81	10.86	12.4	49.56	50.21	12.5	18.22	48.68	12.6	22.79	17.55	12.6	59.02	58.26
3.3	15.51	10.76	13.4	49.36	50.51	13.5	18.04	49.05	13.6	22.83	17.96	13.6	59.17	58.61
4.3	15.23	10.65	14.4	49.17	50.77	14.5	17.86	49.39	14.6	22.86	18.35	14.6	59.30	58.95
5.3	14.97	10.53	15.4	48.98	51.01	15.5	17.68	49.72	15.6	22.88	18.71	15.6	59.43	59.26
6.3	14.72	10.43	16.4	48.80	51.25	16.5	17.51	50.03	16.6	22.91	19.05	16.6	59.55	59.56
7.2	14.48	10.35	17.4	48.63	51.49	17.5	17.36	50.33	17.6	22.94	19.39	17.6	59.67	59.85
8.2	14.25	10.27	18.4	48.48	51.74	18.5	17.23	50.65	18.6	22.99	19.72	18.6	59.81	60.13
9.2	14.01	10.21	19.4	48.33	52.01	19.5	17.12	50.97	19.6	23.05	20.05	19.6	59.96	60.40
0.2	13.74	10.16	20.4	48.18	52.28	20.5	17.01	51.32	20.6	23.12	20.41	20.6	60.12	60.69
1.2	13.46	10.10	21.4	48.02	52.58	21.5	16.89	51.68	21.5	23.19	20.78	21.6	60.28	60.99
2.2	13.18	10.04	22.4	47.84	52.89	22.5	16.75	52.05	22.5	23.26	21.17	22.6	60.44	61.31
3.2	12.87	9.96	23.4	47.65	53.19	23.5	16.60	52.42	23.5	23.31	21.58	23.6	60.59	61.65
24.2	12.57	9.86	24.4	47.45	53.49	24.5	16.42	52.80	24.5	23.34	21.99	24.6	60.75	62.00
25.2	12.27	9.74	25.4	47.24	53.77	25.5	16.21	53.18	25.5	23.36	22.41	25.6	60.89	62.37
26.2	11.98	9.59	26.4	47.01	54.04	26.5	15.97	53.55	26.5	23.37	22.83	26.6	61.02	62.75
27.2	11.70	9.43	27.4	46.78	54.28	27.5	15.72	53.90	27.5	23.35	23.24	27.6	61.13	63.13
28.2	11.43	9.26	28.4	46.54	54.51	28.5	15.46	54.24	28.5	23.32	23.64	28.6	61.24	63.51
29.2	11.18	9.08	29.4	46.31	54.71	29.4	15.18	54.55	29.5	23.28	24.02	29.6	61.33	63.88
30.2	10.94	8.89	30.4	46.08	54.90	30.4	14.91	54.84	30.5	23.24	24.39	30.6	61.41	64.24
31.2	10.72	8.71	31.4	45.87	55.08	31.4	14.66	55.13	31.5	23.21	24.74	31.6	61.49	64.58
	11.96	−11.92		11.10	−11.05		18.47	−18.45		12.26	−12.22		9.78	−9.73
	$1^h\ 42^m$	$9^s.88$		$5^h\ 46^m$	$38^s.12$		$7^h\ 17^m$	$0^s.79$		$9^h\ 9^m$	$14^s.21$		$10^h\ 59^m$	$56^s.00$
	$-85^\circ\ 11'$	$57''.70$		$-84^\circ\ 49'$	$49''.43$		$-86^\circ\ 53'$	$53''.55$		$-85^\circ\ 19'$	$28''.08$		$-84^\circ\ 8'$	$11''.87$

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis (G.). Mag. 5.6			**31 Mensæ (G.).** Mag. 6.2			**7 Octantis (G.).** Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Feb.	1 42	−85 12	Feb.	5 46	−84 49	Feb.	7 17	−86 53	Feb.	9 9	−85 19	Feb.	11 0	−84
	s	″		s	″		s	″		s	″		s	″
0.2	10.72	8.71	0.4	45.87	55.08	0.4	14.66	55.13	0.5	23.21	24.74	0.6	1.49	4.5
1.2	10.49	8.54	1.4	45.66	55.27	1.4	14.42	55.40	1.5	23.18	25.09	1.6	1.57	4.9
2.2	10.25	8.39	2.4	45.45	55.46	2.4	14.19	55.68	2.5	23.17	25.43	2.6	1.67	5.2
3.2	10.01	8.26	3.4	45.25	55.67	3.4	13.98	55.99	3.5	23.17	25.79	3.6	1.78	5.5
4.2	9.75	8.13	4.4	45.05	55.90	4.4	13.77	56.32	4.5	23.16	26.17	4.6	1.90	5.9
5.2	9.47	7.99	5.4	44.84	56.15	5.4	13.54	56.66	5.5	23.16	26.58	5.6	2.02	6.2
6.2	9.18	7.83	6.4	44.60	56.41	6.4	13.28	57.02	6.5	23.15	27.00	6.6	2.14	6.6
7.2	8.89	7.64	7.4	44.34	56.66	7.4	12.99	57.39	7.5	23.12	27.43	7.6	2.25	7.0
8.2	8.59	7.42	8.4	44.07	56.88	8.4	12.66	57.74	8.5	23.06	27.87	8.6	2.34	7.5
9.2	8.31	7.17	9.4	43.78	57.07	9.4	12.31	58.07	9.5	22.98	28.30	9.6	2.42	7.9
10.2	8.06	6.91	10.4	43.49	57.24	10.4	11.95	58.37	10.5	22.88	28.71	10.6	2.47	8.3
11.2	7.83	6.64	11.4	43.21	57.38	11.4	11.59	58.65	11.5	22.77	29.10	11.6	2.51	8.7
12.2	7.61	6.38	12.3	42.96	57.50	12.4	11.23	58.90	12.5	22.66	29.47	12.6	2.54	9.14
13.2	7.41	6.13	13.3	42.72	57.62	13.4	10.90	59.14	13.5	22.57	29.82	13.6	2.58	9.5
14.2	7.21	5.90	14.3	42.48	57.75	14.4	10.58	59.38	14.5	22.48	30.15	14.6	2.62	0.86
15.2	7.00	5.68	15.3	42.24	57.88	15.4	10.29	59.62	15.5	22.41	30.48	15.6	2.67	10.2
16.2	6.79	5.47	16.3	42.01	58.04	16.4	10.00	59.89	16.5	22.35	30.82	16.6	2.73	10.57
17.2	6.56	5.27	17.3	41.77	58.20	17.4	9.71	60.18	17.5	22.29	31.18	17.6	2.80	10.9
18.2	6.32	5.07	18.3	41.53	58.38	18.4	9.41	60.47	18.5	22.23	31.56	18.5	2.88	11.3
19.2	6.07	4.86	19.3	41.28	58.56	19.4	9.10	60.76	19.5	22.16	31.96	19.5	2.94	11.7
20.2	5.82	4.63	20.3	41.01	58.73	20.4	8.76	61.06	20.5	22.07	32.36	20.5	3.01	12.1
21.2	5.57	4.37	21.3	40.73	58.89	21.4	8.40	61.36	21.5	21.98	32.76	21.5	3.07	12.5
22.1	5.32	4.10	22.3	40.45	59.04	22.4	8.02	61.65	22.5	21.87	33.16	22.5	3.11	12.9
23.1	5.08	3.81	23.3	40.16	59.17	23.4	7.61	61.92	23.5	21.73	33.56	23.5	3.13	13.3
24.1	4.87	3.50	24.3	39.86	59.27	24.4	7.19	62.17	24.5	21.58	33.94	24.5	3.14	13.8
25.1	4.66	3.18	25.3	39.55	59.35	25.4	6.77	62.40	25.5	21.42	34.30	25.5	3.14	14.2
26.1	4.47	2.86	26.3	39.26	59.41	26.4	6.35	62.61	26.4	21.26	34.64	26.5	3.13	14.6
27.1	4.29	2.55	27.3	38.99	59.46	27.4	5.94	62.81	27.4	21.09	34.97	27.5	3.11	15.0
28.1	4.13	2.25	28.3	38.72	59.51	28.4	5.55	62.99	28.4	20.93	35.29	28.5	3.10	15.3
29.1	3.96	1.97	29.3	38.46	59.56	29.4	5.17	63.18	29.4	20.79	35.61	29.5	3.10	15.75
30.1	3.79	1.69	30.3	38.21	59.63	30.4	4.82	63.38	30.4	20.66	35.93	30.5	3.10	16.11
31.1	3.60	1.43	31.3	37.96	59.71	31.4	4.47	63.60	31.4	20.55	36.26	31.5	3.12	16.48
	11.95	−11.91		11.10	−11.06		18.49	−18.46		12.27	−12.23		9.79	−9.74
	$1^h\ 42^m$	$9^s.88$		$5^h\ 46^m$	$38^s.12$		$7^h\ 17^m$	$0^s.79$		$9^h\ 9^m$	$14^s.21$		$10^h\ 59^m$	$56^s.00$
	−85° 11′	57″.70		−84° 49′	49″.43		−86° 53′	53″.55		−85° 19′	28″.08		−84° 8′	11″.87

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Octantis (G.). Mag. 5.6			**31 Mensæ** (G.). Mag. 6.2			**7 Octantis** (G.). Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
m ar te.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
r.	1 41	−85 11	Mar.	5 46	−84 49	Mar.	7 16	−86 54	Mar.	9 9	−85 19	Mar.	11 0	−84 8
	s	″		s	″		s	″		s	″		s	″
.1	64.13	62.25	0.3	38.72	59.51	0.4	65.55	2.99	0.4	20.93	35.29	0.5	3.10	15.39
.1	63.96	61.97	1.3	38.46	59.56	1.4	65.17	3.18	1.4	20.79	35.61	1.5	3.10	15.75
.1	63.79	61.69	2.3	38.21	59.63	2.4	64.82	3.38	2.4	20.66	35.93	2.5	3.10	16.11
.1	63.60	61.43	3.3	37.96	59.71	3.4	64.47	3.60	3.4	20.55	36.26	3.5	3.12	16.48
.1	63.40	61.17	4.3	37.70	59.82	4.4	64.11	3.83	4.4	20.44	36.62	4.5	3.15	16.86
.1	63.18	60.90	5.3	37.42	59.95	5.4	63.73	4.09	5.4	20.31	37.00	5.5	3.18	17.27
.1	62.95	60.61	6.3	37.12	60.06	6.3	63.33	4.35	6.4	20.17	37.38	6.5	3.20	17.70
.1	62.73	60.29	7.3	36.80	60.15	7.3	62.89	4.60	7.4	20.01	37.77	7.5	3.20	18.15
.1	62.51	59.94	8.3	36.48	60.23	8.3	62.42	4.84	8.4	19.83	38.16	8.5	3.19	18.59
.1	62.31	59.57	9.3	36.16	60.27	9.3	61.94	5.04	9.4	19.62	38.52	9.5	3.16	19.03
.1	62.14	59.19	10.3	35.85	60.28	10.3	61.45	5.21	10.4	19.40	38.86	10.5	3.11	19.45
.1	61.99	58.82	11.3	35.55	60.26	11.3	60.97	5.36	11.4	19.18	39.17	11.5	3.06	19.86
.1	61.86	58.46	12.3	35.26	60.24	12.3	60.52	5.50	12.4	18.97	39.47	12.5	3.00	20.24
3.1	61.74	58.13	13.3	34.98	60.22	13.3	60.09	5.62	13.4	18.77	39.75	13.5	2.95	20.60
4.1	61.62	57.80	14.3	34.72	60.21	14.3	59.67	5.75	14.4	18.59	40.03	14.5	2.91	20.95
5.1	61.48	57.49	15.3	34.47	60.21	15.3	59.28	5.88	15.4	18.42	40.30	15.5	2.87	21.30
6.1	61.35	57.19	16.3	34.20	60.23	16.3	58.89	6.04	16.4	18.25	40.58	16.5	2.84	21.65
7.1	61.20	56.89	17.3	33.94	60.27	17.3	58.50	6.21	17.4	18.08	40.88	17.5	2.82	22.02
8.1	61.04	56.59	18.3	33.67	60.31	18.3	58.09	6.38	18.4	17.92	41.20	18.5	2.80	22.40
9.1	60.87	56.27	19.3	33.39	60.34	19.3	57.67	6.57	19.4	17.74	41.53	19.5	2.77	22.80
0.1	60.70	55.92	20.2	33.10	60.37	20.3	57.22	6.75	20.4	17.55	41.86	20.5	2.74	23.20
1.1	60.54	55.56	21.2	32.80	60.38	21.3	56.76	6.93	21.4	17.34	42.18	21.5	2.70	23.60
2.1	60.38	55.19	22.2	32.50	60.37	22.3	56.28	7.08	22.4	17.12	42.50	22.5	2.64	24.01
3.1	60.25	54.80	23.2	32.19	60.34	23.3	55.79	7.21	23.4	16.88	42.81	23.5	2.57	24.43
4.1	60.13	54.41	24.2	31.88	60.29	24.3	55.29	7.32	24.4	16.63	43.10	24.5	2.48	24.83
5.1	60.02	54.01	25.2	31.58	60.21	25.3	54.79	7.42	25.4	16.38	43.37	25.5	2.38	25.21
6.1	59.92	53.62	26.2	31.29	60.12	26.3	54.30	7.49	26.4	16.13	43.61	26.4	2.28	25.57
7.1	59.85	53.23	27.2	31.02	60.03	27.3	53.83	7.56	27.4	15.88	43.85	27.4	2.18	25.92
8.1	59.78	52.86	28.2	30.75	59.94	28.3	53.38	7.62	28.4	15.64	44.07	28.4	2.08	26.26
9.1	59.70	52.51	29.2	30.49	59.86	29.3	52.95	7.68	29.4	15.43	44.30	29.4	2.00	26.58
30.1	59.62	52.18	30.2	30.24	59.80	30.3	52.53	7.76	30.4	15.22	44.53	30.4	1.93	26.91
31.0	59.52	51.86	31.2	29.99	59.76	31.3	52.12	7.86	31.4	15.02	44.79	31.4	1.87	27.25
	11.95	−11.91		11.10	−11.06		18.50	−18.47		12.28	−12.24		9.79	−9.74
	$1^{h}\ 42^{m}$	$9^{s}.88$		$5^{h}\ 46^{m}$	$38^{s}.12$		$7^{h}\ 17^{m}$	$0^{s}.79$		$9^{h}\ 9^{m}$	$14^{s}.21$		$10^{h}\ 59^{m}$	$56^{s}.00$
	85° 11′	57″.70		−84° 49′	49″.43		−86° 53′	53″.55		−85° 19′	28″.08		−84° 8′	11″.87

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis (G.). Mag. 5.6			**31 Mensæ** (G.). Mag. 6.2			**7 Octantis** (G.). Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	De
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Apr.	1 41	−85 11	Apr.	5 46	−84 49	Apr.	7 16	−86 54	Apr.	9 9	−85 19	Apr.	10 59	−84
	s	″		s	″		s	″		s	″		s	″
0.0	59.52	51.86	0.2	29.99	59.76	0.3	52.12	7.86	0.4	15.02	44.79	0.4	61.87	27.
1.0	59.41	51.53	1.2	29.72	59.74	1.3	51.69	7.98	1.4	14.81	45.06	1.4	61.81	27.
2.0	59.28	51.17	2.2	29.44	59.71	2.3	51.23	8.11	2.4	14.60	45.35	2.4	61.75	27.
3.0	59.16	50.80	3.2	29.14	59.68	3.3	50.76	8.23	3.4	14.37	45.64	3.4	61.67	28.
4.0	59.03	50.40	4.2	28.84	59.62	4.3	50.25	8.33	4.3	14.12	45.93	4.4	61.58	28.
5.0	58.93	49.98	5.2	28.53	59.53	5.3	49.72	8.42	5.3	13.84	46.21	5.4	61.47	29.
6.0	58.86	49.55	6.2	28.22	59.42	6.3	49.19	8.47	6.3	13.55	46.46	6.4	61.35	29.
7.0	58.81	49.13	7.2	27.92	59.28	7.3	48.67	8.50	7.3	13.26	46.67	7.4	61.21	29.
8.0	58.76	48.71	8.2	27.64	59.12	8.3	48.17	8.50	8.3	12.98	46.86	8.4	61.06	30.
9.0	58.73	48.32	9.2	27.38	58.96	9.3	47.70	8.49	9.3	12.71	47.03	9.4	60.93	30.
10.0	58.72	47.94	10.2	27.14	58.81	10.3	47.24	8.48	10.3	12.45	47.19	10.4	60.80	30.
11.0	58.69	47.59	11.2	26.90	58.67	11.3	46.82	8.48	11.3	12.20	47.35	11.4	60.68	31.
12.0	58.66	47.25	12.2	26.67	58.55	12.2	46.41	8.49	12.3	11.97	47.52	12.4	60.57	31.
13.0	58.61	46.90	13.2	26.43	58.44	13.2	45.99	8.52	13.3	11.74	47.71	13.4	60.47	31.
14.0	58.56	46.56	14.2	26.20	58.34	14.2	45.57	8.56	14.3	11.51	47.91	14.4	60.38	32.
15.0	58.49	46.21	15.2	25.95	58.24	15.2	45.14	8.60	15.3	11.28	48.12	15.4	60.28	32.
16.0	58.43	45.86	16.2	25.68	58.14	16.2	44.69	8.65	16.3	11.03	48.33	16.4	60.17	32.
17.0	58.37	45.48	17.2	25.42	58.02	17.2	44.23	8.69	17.3	10.77	48.54	17.4	60.06	32.
17.9	58.32	45.08	18.2	25.16	57.89	18.2	43.74	8.72	18.3	10.50	48.74	18.4	59.93	33.
18.9	58.28	44.67	19.2	24.89	57.74	19.2	43.25	8.72	19.3	10.22	48.93	19.4	59.79	33.
19.9	58.26	44.27	20.2	24.62	57.56	20.2	42.75	8.69	20.3	9.92	49.11	20.4	59.64	33.
20.9	58.26	43.85	21.2	24.34	57.36	21.2	42.25	8.66	21.3	9.62	49.26	21.4	59.47	34.
21.9	58.28	43.43	22.2	24.09	57.15	22.2	41.76	8.60	22.3	9.31	49.39	22.4	59.30	34.
22.9	58.30	43.02	23.2	23.86	56.94	23.2	41.29	8.53	23.3	9.01	49.51	23.4	59.13	34.
23.9	58.33	42.63	24.2	23.63	56.72	24.2	40.85	8.45	24.3	8.72	49.61	24.4	58.96	35.
24.9	58.36	42.27	25.1	23.41	56.51	25.2	40.42	8.36	25.3	8.46	49.69	25.4	58.81	35.
25.9	58.39	41.92	26.1	23.21	56.32	26.2	40.01	8.30	26.3	8.20	49.79	26.4	58.66	35.
26.9	58.41	41.58	27.1	23.01	56.15	27.2	39.61	8.26	27.3	7.96	49.91	27.4	58.53	35.
27.9	58.41	41.25	28.1	22.80	56.00	28.2	39.20	8.22	28.3	7.72	50.04	28.4	58.41	36.
28.9	58.40	40.91	29.1	22.57	55.85	29.2	38.79	8.21	29.3	7.48	50.19	29.4	58.28	36.3
29.9	58.38	40.54	30.1	22.34	55.69	30.2	38.35	8.21	30.3	7.21	50.35	30.4	58.15	36.6
30.9	58.37	40.15	31.1	22.08	55.51	31.2	37.88	8.18	31.3	6.93	50.52	31.4	58.00	36.
	11.94	−11.90		11.10	−11.06		18.51	−18.48		12.28	−12.24		9.80	−9.7
	1h 42m	9s.88		5h 46m	38s.12		7h 17m	0s.79		9h 9m	14s.21		10h 59m	56s.00
	−85° 11′	57″.70		−84° 49′	49″.43		−86° 53′	53″.55		−85° 19′	28″.08		−84° 8′	11″.8

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Octantis (G.). Mag. 5.6			81 Mensæ (G.). Mag. 6.2			7 Octantis (G.). Mag. 6.4			ζ Octantis. Mag. 5.4			η Octantis. Mag. 6.3		
an lar ite.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
y	1 41	−85 11	May	5 46	−84 49	May	7 16	−86 54	May	9 8	−85 19	May	10 59	−84 8
	s	″		s	″		s	″		s	″		s	″
.9	58.37	40.15	1.1	22.08	55.51	1.2	37.88	8.18	1.3	66.93	50.52	1.4	58.00	36.95
.9	58.36	39.74	2.1	21.82	55.32	2.2	37.39	8.14	2.3	66.63	50.67	2.3	57.84	37.25
.9	58.38	39.31	3.1	21.57	55.11	3.2	36.89	8.07	3.3	66.32	50.80	3.3	57.66	37.54
.9	58.43	38.89	4.1	21.33	54.85	4.2	36.40	7.97	4.3	65.99	50.89	4.3	57.46	37.81
4.9	58.49	38.47	5.1	21.10	54.58	5.2	35.93	7.84	5.3	65.67	50.95	5.3	57.26	38.05
5.9	58.58	38.07	6.1	20.90	54.30	6.2	35.48	7.70	6.3	65.36	51.00	6.3	57.06	38.26
6.9	58.68	37.70	7.1	20.71	54.03	7.2	35.06	7.55	7.3	65.08	51.03	7.3	56.87	38.45
7.9	58.77	37.36	8.1	20.54	53.77	8.2	34.68	7.41	8.3	64.81	51.05	8.3	56.68	38.63
8.9	58.85	37.04	9.1	20.38	53.53	9.2	34.31	7.29	9.3	64.55	51.08	9.3	56.52	38.81
9.9	58.92	36.73	10.1	20.21	53.31	10.2	33.96	7.18	10.2	64.30	51.12	10.3	56.37	38.98
0.9	58.98	36.41	11.1	20.05	53.10	11.2	33.60	7.08	11.2	64.06	51.17	11.3	56.22	39.17
1.9	59.02	36.09	12.1	19.87	52.89	12.2	33.23	6.98	12.2	63.81	51.24	12.3	56.07	39.37
2.9	59.06	35.76	13.1	19.69	52.68	13.2	32.85	6.89	13.2	63.56	51.30	13.3	55.92	39.57
3.9	59.12	35.42	14.1	19.50	52.47	14.2	32.45	6.80	14.2	63.29	51.38	14.3	55.76	39.79
4.9	59.17	35.07	15.1	19.31	52.25	15.2	32.03	6.70	15.2	63.01	51.44	15.3	55.59	40.00
5.9	59.24	34.70	16.1	19.12	52.00	16.2	31.62	6.58	16.2	62.72	51.49	16.3	55.40	40.21
6.9	59.33	34.33	17.1	18.93	51.73	17.2	31.19	6.44	17.2	62.43	51.53	17.3	55.21	40.42
7.9	59.42	33.95	18.1	18.74	51.44	18.1	30.77	6.28	18.2	62.12	51.54	18.3	55.00	40.61
8.9	59.54	33.57	19.1	18.56	51.13	19.1	30.35	6.10	19.2	61.82	51.53	19.3	54.79	40.78
9.9	59.66	33.20	20.1	18.40	50.82	20.1	29.95	5.90	20.2	61.51	51.50	20.3	54.57	40.93
0.9	59.81	32.86	21.1	18.24	50.51	21.1	29.58	5.70	21.2	61.22	51.46	21.3	54.36	41.06
1.9	59.96	32.54	22.1	18.11	50.20	22.1	29.23	5.49	22.2	60.95	51.41	22.3	54.15	41.17
2.9	60.09	32.23	23.1	17.99	49.90	23.1	28.91	5.29	23.2	60.69	51.36	23.3	53.96	41.28
3.9	60.23	31.94	24.1	17.87	49.63	24.1	28.60	5.11	24.2	60.45	51.32	24.3	53.78	41.38
4.9	60.34	31.66	25.1	17.76	49.38	25.1	28.29	4.95	25.2	60.22	51.30	25.3	53.62	41.50
5.9	60.44	31.38	26.1	17.62	49.14	26.1	27.98	4.81	26.2	59.98	51.30	26.3	53.46	41.63
6.9	60.53	31.08	27.1	17.48	48.90	27.1	27.64	4.68	27.2	59.73	51.31	27.3	53.29	41.78
7.9	60.61	30.76	28.1	17.32	48.65	28.1	27.28	4.54	28.2	59.47	51.32	28.3	53.11	41.95
8.9	60.70	30.43	29.1	17.15	48.39	29.1	26.89	4.38	29.2	59.19	51.33	29.3	52.92	42.11
9.9	60.82	30.07	30.1	16.99	48.10	30.1	26.49	4.20	30.2	58.89	51.33	30.3	52.72	42.27
0.9	60.96	29.70	31.1	16.84	47.77	31.1	26.10	3.99	31.2	58.59	51.30	31.3	52.50	42.41
1.9	61.12	29.34	32.0	16.70	47.43	32.1	25.73	3.75	32.2	58.28	51.23	32.3	52.27	42.52
	11.93	−11.89		11.10	−11.05		18.50	−18.48		12.29	−12.24		9.80	−9.75
	1h 42m	9s.88		5h 46m	38s.12		7h 17m	0s.79		9h 9m	14s.21		10h 59m	56s.00
	85° 11′	57″.70		−84° 49′	49″.43		−86° 53′	53″.55		−85° 19′	28″.08		−84° 8′	11″.87

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis (G.). Mag. 5.6			**31 Mensæ** (G.). Mag. 6.2			**7 Octantis** (G.). Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Decl nati Sout
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
June	1 42	−85 11	June	5 46	−84 49	June	7 16	−86 53	June	9 8	−85 19	June	10 59	−84
	s	″		s	″		s	″		s	″		s	″
0.9	1.12	29.34	1.0	16.70	47.43	1.1	25.73	63.75	1.2	58.28	51.23	1.3	52.27	42.5
1.9	1.30	29.01	2.0	16.58	47.08	2.1	25.38	63.50	2.2	57.99	51.13	2.3	52.04	42.6
2.9	1.49	28.72	3.0	16.48	46.73	3.1	25.07	63.24	3.2	57.72	51.02	3.2	51.82	42.6
3.9	1.68	28.44	4.0	16.40	46.39	4.1	24.78	62.98	4.2	57.46	50.90	4.3	51.61	42.7
4.9	1.86	28.18	5.0	16.33	46.08	5.1	24.53	62.73	5.2	57.23	50.78	5.3	51.42	42.7
5.9	2.03	27.94	6.0	16.26	45.78	6.1	24.29	62.50	6.2	57.01	50.67	6.3	51.24	42.7
6.9	2.19	27.70	7.0	16.20	45.50	7.1	24.05	62.29	7.2	56.80	50.57	7.2	51.06	42.8
7.9	2.33	27.47	8.0	16.13	45.23	8.1	23.81	62.08	8.2	56.58	50.49	8.2	50.90	42.8
8.9	2.48	27.23	9.0	16.05	44.96	9.1	23.56	61.88	9.2	56.36	50.41	9.2	50.73	42.9
9.9	2.62	26.98	10.0	15.96	44.69	10.1	23.30	61.68	10.2	56.13	50.33	10.2	50.55	42.0
10.9	2.77	26.72	11.0	15.87	44.41	11.1	23.02	61.48	11.2	55.89	50.26	11.2	50.37	43.0
11.8	2.92	26.45	12.0	15.78	44.11	12.1	22.74	61.26	12.2	55.65	50.18	12.2	50.18	43.1
12.8	3.10	26.18	13.0	15.69	43.79	13.1	22.45	61.02	13.2	55.39	50.08	13.2	49.97	43.1
13.8	3.28	25.89	14.0	15.60	43.46	14.1	22.15	60.76	14.2	55.13	49.96	14.2	49.76	43.2
14.8	3.48	25.60	15.0	15.52	43.11	15.1	21.87	60.49	15.2	54.87	49.82	15.2	49.53	43.2
15.8	3.70	25.33	16.0	15.46	42.75	16.1	21.61	60.20	16.1	54.61	49.66	16.2	49.30	43.2
16.8	3.92	25.08	17.0	15.41	42.39	17.1	21.37	59.89	17.1	54.36	49.49	17.2	49.09	43.2
17.8	4.15	24.85	18.0	15.38	42.03	18.1	21.15	59.59	18.1	54.12	49.30	18.2	48.87	43.2
18.8	4.38	24.64	18.9	15.37	41.68	19.1	20.97	59.29	19.1	53.91	49.10	19.2	48.66	43.1
19.8	4.60	24.46	19.9	15.36	41.36	20.1	20.81	59.01	20.1	53.72	48.91	20.2	48.48	43.1
20.8	4.80	24.29	20.9	15.34	41.07	21.1	20.65	58.75	21.1	53.54	48.75	21.2	48.31	43.0
21.8	4.98	24.12	21.9	15.33	40.79	22.1	20.49	58.51	22.1	53.35	48.60	22.2	48.15	43.0
22.8	5.15	23.94	22.9	15.30	40.52	23.1	20.32	58.29	23.1	53.17	48.46	23.2	47.98	43.0
23.8	5.32	23.74	23.9	15.27	40.25	24.0	20.12	58.07	24.1	52.98	48.34	24.2	47.82	43.0
24.8	5.48	23.52	24.9	15.21	39.97	25.0	19.91	57.83	25.1	52.76	48.22	25.2	47.64	43.0
25.8	5.66	23.28	25.9	15.16	39.65	26.0	19.68	57.58	26.1	52.53	48.09	26.2	47.44	43.0
26.8	5.87	23.03	26.9	15.12	39.31	27.0	19.44	57.31	27.1	52.29	47.94	27.2	47.23	43.0
27.8	6.10	22.80	27.9	15.08	38.95	28.0	19.22	57.01	28.1	52.05	47.75	28.2	47.01	43.0
28.8	6.34	22.58	28.9	15.06	38.58	29.0	19.01	56.68	29.1	51.82	47.53	29.2	46.79	42.0
29.8	6.60	22.39	29.9	15.07	38.21	30.0	18.85	56.34	30.1	51.61	47.30	30.2	46.57	42 00
30.8	6.87	22.22	30.9	15.09	37.86	31.0	18.72	56.00	31.1	51.41	47.06	31.2	46.37	42.8
31.8	7.12	22.08	31.9	15.13	37.52	32.0	18.63	55.67	32.1	51.24	46.81	32.2	46.18	42 68
11.93		−11.88	11.09		−11.05	18.49		−18.46	12.28		−12.24	9.80		−9.75
1h 42m		9s.88	5h 46m		38s.12	7h 17m		0s.79	9h 9m		14s.21	10h 59m		56s.00
−85° 11′		57″.70	−84° 49′		49″.43	−86° 53′		53″.55	−85° 19′		28″.08	−84° 8′		11″.87

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Octantis (G.).			31 Mensæ (G.).			7 Octantis (G.).			ζ Octantis.			η Octantis.		
Mag. 5.6			Mag. 6.2			Mag. 6.4			Mag. 5.4			Mag. 6.3		
ean lar te.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
ly	1 42	−85 11	July	5 46	−84 49	July	7 16	−86 53	July	9 8	−85 19	July	10 59	−84 8
	s	″		s	″		s	″		s	″		s	″
0.8	6.87	22.22	0.9	15.09	37.86	1.0	18.72	56.00	1.1	51.41	47.06	1.2	46.37	42.80
1.8	7.12	22.08	1.9	15.13	37.52	2.0	18.63	55.67	2.1	51.24	46.81	2.2	46.18	42.68
2.8	7.37	21.96	2.9	15.17	37.20	3.0	18.55	55.36	3.1	51.09	46.57	3.2	46.01	42.55
3.8	7.60	21.85	3.9	15.22	36.89	4.0	18.48	55.08	4.1	50.94	46.35	4.2	45.84	42.43
4.8	7.82	21.74	4.9	15.27	36.61	5.0	18.42	54.80	5.1	50.81	46.13	5.2	45.69	42.33
5.8	8.04	21.64	5.9	15.31	36.34	6.0	18.35	54.53	6.1	50.67	45.93	6.2	45.53	42.23
6.8	8.24	21.52	6.9	15.33	36.06	7.0	18.26	54.28	7.1	50.53	45.74	7.2	45.38	42.14
7.8	8.45	21.39	7.9	15.36	35.78	8.0	18.16	54.02	8.1	50.37	45.55	8.2	45.21	42.05
8.8	8.66	21.26	8.9	15.39	35.49	9.0	18.05	53.76	9.1	50.21	45.35	9.2	45.04	41.97
9.8	8.87	21.13	9.9	15.41	35.18	10.0	17.94	53.47	10.1	50.04	45.13	10.2	44.86	41.89
0.8	9.11	20.99	10.9	15.44	34.87	11.0	17.83	53.16	11.1	49.86	44.91	11.2	44.68	41.80
1.8	9.35	20.85	11.9	15.46	34.54	11.9	17.72	52.84	12.1	49.68	44.66	12.2	44.48	41.68
2.8	9.61	20.71	12.9	15.51	34.19	12.9	17.62	52.51	13.1	49.51	44.40	13.2	44.29	41.55
13.8	9.88	20.59	13.9	15.58	33.83	13.9	17.56	52.17	14.1	49.35	44.12	14.1	44.09	41.40
14.8	10.16	20.49	14.9	15.66	33.49	14.9	17.53	51.81	15.1	49.20	43.83	15.1	43.90	41.23
15.8	10.44	20.42	15.9	15.76	33.16	15.9	17.51	51.47	16.1	49.07	43.53	16.1	43.72	41.04
16.8	10.71	20.37	16.9	15.85	32.86	16.9	17.52	51.14	17.1	48.96	43.23	17.1	43.56	40.84
17.8	10.96	20.34	17.9	15.95	32.57	17.9	17.55	50.84	18.1	48.86	42.95	18.1	43.42	40.65
18.7	11.19	20.32	18.9	16.06	32.31	18.9	17.58	50.55	19.1	48.78	42.70	19.1	43.29	40.47
19.7	11.42	20.30	19.9	16.15	32.07	19.9	17.60	50.28	20.1	48.70	42.47	20.1	43.16	40.31
20.7	11.62	20.26	20.9	16.23	31.83	20.9	17.61	50.03	21.1	48.61	42.24	21.1	43.04	40.16
21.7	11.83	20.20	21.9	16.29	31.58	21.9	17.60	49.78	22.0	48.50	42.02	22.1	42.91	40.03
22.7	12.03	20.13	22.9	16.35	31.31	22.9	17.56	49.52	23.0	48.38	41.80	23.1	42.76	39.91
23.7	12.25	20.04	23.9	16.42	31.02	23.9	17.51	49.22	24.0	48.25	41.56	24.1	42.60	39.77
24.7	12.50	19.95	24.9	16.49	30.71	24.9	17.48	48.90	25.0	48.12	41.29	25.1	42.43	39.62
25.7	12.77	19.87	25.9	16.57	30.39	25.9	17.46	48.57	26.0	47.98	40.99	26.1	42.25	39.44
26.7	13.05	19.82	26.9	16.68	30.06	26.9	17.47	48.22	27.0	47.86	40.67	27.1	42.07	39.23
27.7	13.33	19.81	27.9	16.81	29.75	27.9	17.53	47.87	28.0	47.77	40.35	28.1	41.91	39.00
28.7	13.62	19.81	28.9	16.95	29.45	28.9	17.60	47.53	29.0	47.69	40.02	29.1	41.76	38.75
29.7	13.90	19.84	29.9	17.11	29.19	29.9	17.71	47.21	30.0	47.64	39.70	30.1	41.64	38.50
30.7	14.15	19.88	30.9	17.27	28.94	30.9	17.83	46.91	31.0	47.61	39.39	31.1	41.52	38.25
31.7	14.39	19.93	31.9	17.42	28.71	31.9	17.96	46.63	32.0	47.57	39.10	32.1	41.42	38.01
11.92	−11.88		11.09	−11.04		18.48	−18.45		12.28	−12.24		9.80	−9.75	
$1^h\ 42^m$	$9^s.88$		$5^h\ 46^m$	$38^s.12$		$7^h\ 17^m$	$0^s.79$		$9^h\ 9^m$	$14^s.21$		$10^h\ 59^m$	$56^s.00$	
−85° 11′	57″.70		−84° 49′	49″.43		−86° 53′	53″.55		−85° 19′	28″.08		−84° 8′	11″.87	

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis (G.). Mag. 5.6			**31 Mensæ (G.).** Mag. 6.2			**7 Octantis (G.).** Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
Mean Solar Date.	Right Ascension.	Declination *South*.	Mean Solar Date.	Right Ascension.	Declination *South*.	Mean Solar Date.	Right Ascension.	Declination *South*.	Mean Solar Date.	Right Ascension.	Declination *South*.	Mean Solar Date.	Right Ascension.	Decli-
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Aug.	1 42	−85 11	Aug.	5 46	−84 49	Aug.	7 16	−86 53	Aug.	9 8	−85 19	Aug.	10 59	−84
	s	″		s	″		s	″		s	″		s	″
0.7	14.39	19.93	0.9	17.42	28.71	0.9	17.96	46.63	1.0	47.57	39.10	1.1	41.42	38.
1.7	14.60	19.99	1.9	17.56	28.50	1.9	18.08	46.37	2.0	47.54	38.83	2.1	41.32	37.
2.7	14.82	20.03	2.9	17.69	28.29	2.9	18.19	46.11	3.0	47.51	38.57	3.1	41.22	37.
3.7	15.03	20.08	3.9	17.82	28.07	3.9	18.29	45.85	4.0	47.48	38.30	4.1	41.12	37.
4.7	15.25	20.11	4.9	17.96	27.85	4.9	18.38	45.59	5.0	47.43	38.03	5.1	41.01	37.
5.7	15.47	20.13	5.9	18.08	27.62	5.9	18.46	45.33	6.0	47.38	37.77	6.1	40.90	36.
6.7	15.71	20.14	6.9	18.20	27.37	6.9	18.54	45.05	7.0	47.31	37.49	7.1	40.78	36.
7.7	15.95	20.16	7.9	18.33	27.12	7.9	18.62	44.74	8.0	47.26	37.19	8.1	40.65	36.5
8.7	16.20	20.18	8.9	18.48	26.86	8.9	18.71	44.43	9.0	47.19	36.88	9.1	40.52	36.
9.7	16.46	20.22	9.9	18.64	26.60	9.9	18.83	44.11	9.9	47.15	36.55	10.1	40.39	36.
10.7	16.73	20.27	10.9	18.80	26.33	10.9	18.97	43.79	10.9	47.11	36.20	11.1	40.27	35.7
11.7	17.00	20.34	11.9	18.99	26.08	11.9	19.13	43.47	11.9	47.10	35.86	12.1	40.16	35.4
12.7	17.27	20.44	12.9	19.19	25.85	12.9	19.33	43.16	12.9	47.10	35.52	13.1	40.06	35.
13.7	17.52	20.57	13.8	19.39	25.64	13.9	19.54	42.88	13.9	47.12	35.19	14.1	39.98	34.
14.7	17.74	20.71	14.8	19.59	25.47	14.9	19.77	42.62	14.9	47.16	34.88	15.1	39.92	34.5
15.7	17.95	20.85	15.8	19.78	25.32	15.9	19.99	42.39	15.9	47.20	34.59	16.1	39.87	34.
16.7	18.15	20.98	16.8	19.95	25.19	16.9	20.19	42.17	16.9	47.24	34.32	17.1	39.82	34.
17.7	18.33	21.10	17.8	20.12	25.04	17.9	20.37	41.97	17.9	47.27	34.07	18.1	39.77	33.7
18.7	18.52	21.19	18.8	20.27	24.89	18.9	20.53	41.76	18.9	47.29	33.82	19.0	39.71	33.
19.7	18.71	21.26	19.8	20.42	24.72	19.9	20.67	41.52	19.9	47.29	33.56	20.0	39.63	33.
20.7	18.93	21.34	20.8	20.57	24.52	20.9	20.81	41.26	20.9	47.28	33.28	21.0	39.53	33.
21.7	19.16	21.42	21.8	20.74	24.30	21.9	20.98	40.98	21.9	47.27	32.98	22.0	39.44	32.
22.7	19.40	21.52	22.8	20.93	24.08	22.9	21.16	40.69	22.9	47.26	32.65	23.0	39.35	32.
23.7	19.64	21.64	23.8	21.14	23.87	23.9	21.38	40.40	23.9	47.28	32.32	24.0	39.26	32.
24.6	19.90	21.79	24.8	21.35	23.68	24.9	21.63	40.12	24.9	47.33	31.98	25.0	39.19	31.
25.6	20.14	21.97	25.8	21.58	23.52	25.9	21.91	39.85	25.9	47.40	31.64	26.0	39.15	31.5
26.6	20.35	22.17	26.8	21.81	23.38	26.9	22.20	39.61	26.9	47.48	31.31	27.0	39.11	31.
27.6	20.55	22.37	27.8	22.05	23.26	27.9	22.50	39.40	27.9	47.58	31.00	28.0	39.09	30.
28.6	20.74	22.58	28.8	22.28	23.17	28.9	22.80	39.20	28.9	47.69	30.72	29.0	39.08	30.
29.6	20.91	22.78	29.8	22.49	23.08	29.9	23.09	39.02	29.9	47.79	30.46	30.0	39.08	30.
30.6	21.08	22.98	30.8	22.71	23.00	30.9	23.36	38.83	30.9	47.89	30.20	31.0	39.07	30.0
31.6	21.24	23.17	31.8	22.91	22.91	31.9	23.62	38.66	31.9	47.97	29.95	32.0	39.05	29.7
	11.92	−11.88		11.08	−11.04		18.46	−18.44		12.27	−12.23		9.80	−9.75
	$1^h\ 42^m$	$9^s.88$		$5^h\ 46^m$	$38^s.12$		$7^h\ 17^m$	$0^s.79$		$9^h\ 9^m$	$14^s.21$		$10^h\ 59^m$	$56^s.00$
	−85° 11′	57″.70		−84° 49′	49″.43		−86° 53′	53″.55		−85° 19′	28″.08		−84° 8′	11″.87

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Octantis (G.). Mag. 5.6			31 Mensæ (G.). Mag. 6.2			7 Octantis (G.). Mag. 6.4			ζ Octantis. Mag. 5.4			η Octantis. Mag. 6.3		
n r e.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
t.	1 42	−85 11	Sept.	5 46	−84 49	Sept.	7 16	−86 53	Sept.	9 8	−85 19	Sept.	10 59	−84 8
	s	″		s	″		s	″		s	″		s	″
6	21.24	23.17	0.8	22.91	22.91	0.9	23.62	38.66	0.9	47.97	29.95	1.0	39.05	29.75
6	21.41	23.34	1.8	23.10	22.82	1.9	23.88	38.48	1.9	48.05	29.69	2.0	39.04	29.48
6	21.58	23.51	2.8	23.30	22.71	2.9	24.13	38.29	2.9	48.12	29.42	3.0	39.01	29.21
6	21.76	23.68	3.8	23.50	22.60	3.9	24.38	38.08	3.9	48.20	29.14	4.0	38.98	28.93
6	21.95	23.85	4.8	23.69	22.48	4.9	24.63	37.87	4.9	48.27	28.85	5.0	38.94	28.63
.6	22.16	24.02	5.8	23.90	22.34	5.8	24.90	37.64	5.9	48.34	28.55	6.0	38.90	28.33
.6	22.37	24.21	6.8	24.13	22.22	6.8	25.18	37.41	6.9	48.42	28.24	6.9	38.88	28.01
.6	22.58	24.42	7.8	24.36	22.11	7.8	25.50	37.18	7.9	48.52	27.92	7.9	38.86	27.68
.6	22.78	24.66	8.8	24.61	22.01	8.8	25.84	36.97	8.9	48.65	27.61	8.9	38.85	27.34
.6	22.96	24.91	9.8	24.87	21.94	9.8	26.20	36.79	9.9	48.80	27.31	9.9	38.87	26.99
.6	23.12	25.18	10.8	25.12	21.90	10.8	26.58	36.63	10.9	48.96	27.03	10.9	38.90	26.65
.6	23.27	25.47	11.8	25.37	21.89	11.8	26.94	36.50	11.9	49.13	26.77	11.9	38.95	26.34
.6	23.39	25.74	12.8	25.60	21.90	12.8	27.30	36.39	12.9	49.30	26.54	12.9	39.00	26.05
.6	23.50	25.98	13.8	25.82	21.90	13.8	27.63	36.29	13.9	49.46	26.33	13.9	39.05	25.77
.6	23.61	26.22	14.8	26.02	21.91	14.8	27.94	36.19	14.9	49.60	26.13	14.9	39.09	25.51
.6	23.72	26.44	15.8	26.22	21.90	15.8	28.23	36.08	15.9	49.72	25.93	15.9	39.12	25.26
.6	23.84	26.64	16.8	26.41	21.87	16.8	28.51	35.95	16.9	49.84	25.71	16.9	39.13	25.01
.6	23.97	26.85	17.8	26.61	21.82	17.8	28.80	35.80	17.9	49.95	25.48	17.9	39.14	24.74
.6	24.12	27.06	18.8	26.83	21.76	18.8	29.10	35.63	18.9	50.07	25.22	18.9	39.15	24.44
.6	24.29	27.29	19.7	27.07	21.71	19.8	29.44	35.46	19.9	50.21	24.95	19.9	39.17	24.13
.6	24.45	27.56	20.7	27.32	21.67	20.8	29.80	35.30	20.9	50.37	24.67	20.9	39.20	23.79
.6	24.60	27.85	21.7	27.58	21.65	21.8	30.19	35.15	21.9	50.55	24.39	21.9	39.24	23.45
.6	24.74	28.15	22.7	27.84	21.67	22.8	30.60	35.04	22.9	50.75	24.13	22.9	39.31	23.12
.6	24.85	28.47	23.7	28.10	21.71	23.8	31.02	34.95	23.9	50.96	23.89	23.9	39.39	22.80
.6	24.94	28.80	24.7	28.36	21.78	24.8	31.44	34.88	24.9	51.18	23.68	24.9	39.49	22.48
.6	25.01	29.12	25.7	28.60	21.86	25.8	31.85	34.83	25.9	51.40	23.49	25.9	39.58	22.19
.6	25.08	29.44	26.7	28.83	21.94	26.8	32.23	34.79	26.9	51.61	23.31	26.9	39.68	21.91
.6	25.15	29.74	27.7	29.05	22.02	27.8	32.60	34.75	27.9	51.81	23.14	27.9	39.78	21.65
.6	25.21	30.02	28.7	29.27	22.10	28.8	32.96	34.72	28.9	52.01	22.97	28.9	39.86	21.40
.6	25.27	30.28	29.7	29.48	22.16	29.8	33.32	34.67	29.9	52.20	22.81	29.9	39.95	21.15
.5	25.35	30.55	30.7	29.68	22.22	30.8	33.66	34.62	30.9	52.39	22.63	30.9	40.03	20.89
.5	25.43	30.82	31.7	29.89	22.27	31.8	34.00	34.55	31.9	52.57	22.44	31.9	40.10	20.63
	11.93	−11.89		11.08	−11.04		18.45	−18.42		12.27	−12.23		9.80	−9.74
	$1^h 42^m$	$9^s.88$		$5^h 46^m$	$38^s.12$		$7^h 17^m$	$0^s.79$		$9^h 9^m$	$14^s.21$		$10^h 59^m$	$56^s.00$
	5° 11′	57″.70		−84° 49′	49″.43		−86° 53′	53″.55		−85° 19′	28″.08		−84° 8′	11″.87

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis (G.). Mag. 5.6			**31 Mensæ** (G.). Mag. 6.2			**7 Octantis** (G.). Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis** Mag. 6.3	
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m
Oct.	1 42	−85 11	Oct.	5 46	−84 49	Oct.	7 16	−86 53	Oct.	9 8	−85 19	Oct.	10 59
	s	″		s	″		s	″		s	″		s
0.5	25.35	30.55	0.7	29.68	22.22	0.8	33.66	34.62	0.9	52.39	22.63	0.9	40.03
1.5	25.43	30.82	1.7	29.89	22.27	1.8	34.00	34.55	1.9	52.57	22.44	1.9	40.10
2.5	25.52	31.09	2.7	30.11	22.31	2.8	34.35	34.49	2.9	52.75	22.24	2.9	40.17
3.5	25.60	31.36	3.7	30.33	22.35	3.8	34.72	34.42	3.8	52.94	22.04	3.9	40.25
4.5	25.70	31.65	4.7	30.57	22.40	4.8	35.11	34.35	4.8	53.15	21.83	4.9	40.32
5.5	25.80	31.96	5.7	30.81	22.47	5.8	35.51	34.29	5.8	53.36	21.62	5.9	40.42
6.5	25.88	32.29	6.7	31.07	22.56	6.8	35.93	34.24	6.8	53.60	21.43	6.9	40.53
7.5	25.93	32.64	7.7	31.32	22.68	7.8	36.37	34.23	7.8	53.86	21.25	7.9	40.66
8.5	25.96	33.00	8.7	31.57	22.83	8.8	36.81	34.24	8.8	54.12	21.10	8.9	40.81
9.5	25.98	33.36	9.7	31.79	23.00	9.8	37.24	34.28	9.8	54.39	20.98	9.9	40.96
10.5	25.97	33.69	10.7	32.00	23.18	10.8	37.64	34.34	10.8	54.64	20.88	10.9	41.11
11.5	25.96	34.00	11.7	32.20	23.35	11.7	38.02	34.40	11.8	54.89	20.80	11.9	41.26
12.5	25.93	34.29	12.7	32.38	23.52	12.7	38.36	34.47	12.8	55.12	20.73	12.9	41.40
13.5	25.92	34.56	13.7	32.55	23.66	13.7	38.69	34.51	13.8	55.33	20.65	13.9	41.53
14.5	25.93	34.82	14.7	32.73	23.78	14.7	39.02	34.53	14.8	55.53	20.55	14.9	41.64
15.5	25.95	35.09	15.7	32.92	23.89	15.7	39.36	34.55	15.8	55.74	20.43	15.9	41.75
16.5	25.98	35.37	16.7	33.13	24.00	16.7	39.72	34.55	16.8	55.95	20.30	16.9	41.86
17.5	26.02	35.67	17.7	33.35	24.13	17.7	40.11	34.55	17.8	56.18	20.16	17.9	41.98
18.5	26.06	36.00	18.7	33.57	24.27	18.7	40.52	34.57	18.8	56.43	20.02	18.9	42.12
19.5	26.08	36.34	19.7	33.80	24.43	19.7	40.95	34.61	19.8	56.70	19.90	19.9	42.28
20.5	26.07	36.70	20.7	34.04	24.63	20.7	41.39	34.68	20.8	56.99	19.80	20.9	42.46
21.5	26.04	37.07	21.7	34.27	24.85	21.7	41.83	34.78	21.8	57.29	19.72	21.9	42.64
22.5	25.99	37.43	22.7	34.47	25.09	22.7	42.25	34.88	22.8	57.59	19.67	22.9	42.83
23.5	25.93	37.77	23.7	34.66	25.34	23.7	42.66	35.01	23.8	57.87	19.64	23.9	43.03
24.5	25.86	38.10	24.7	34.84	25.59	24.7	43.04	35.15	24.8	58.15	19.63	24.9	43.22
25.5	25.79	38.41	25.6	35.02	25.83	25.7	43.41	35.29	25.8	58.42	19.61	25.9	43.40
26.5	25.72	38.71	26.6	35.18	26.05	26.7	43.77	35.42	26.8	58.67	19.60	26.9	43.58
27.5	25.66	39.00	27.6	35.34	26.27	27.7	44.11	35.54	27.8	58.92	19.58	27.9	43.75
28.5	25.60	39.28	28.6	35.49	26.48	28.7	44.44	35.65	28.8	59.16	19.56	28.9	43.91
29.5	25.56	39.56	29.6	35.65	26.68	29.7	44.77	35.76	29.8	59.39	19.53	29.9	44.07
30.5	25.52	39.84	30.6	35.82	26.87	30.7	45.12	35.86	30.8	59.64	19.49	30.9	44.23
31.5	25.47	40.14	31.6	35.99	27.08	31.7	45.48	35.96	31.8	59.89	19.44	31.8	44.40
	11.93	−11.89		11.08	−11.04		18.45	−18.42		12.26	−12.22		9.79
	1h 42m	9s.88		5h 46m	38s.12		7h 17m	0s.79		9h 9m	14s.21		10h 59m
	−85° 11′	57″.70		−84° 49′	49″.43		−86° 53′	53″.55		−85° 19′	28″.08		−84° 8′

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

Octantis (G.). Mag. 5.6			31 Mensæ (G.). Mag. 6.2			7 Octantis (G.). Mag. 6.4			ζ Octantis. Mag. 5.4			η Octantis. Mag. 6.3		
an lar te.	Right Ascension.	Declination *South*.	Mean Solar Date.	Right Ascension.	Declination *South*.	Mean Solar Date.	Right Ascension.	Declination *South*.	Mean Solar Date.	Right Ascension.	Declination *South*.	Mean Solar Date.	Right Ascension.	Declination *South*.
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
v.	1 42	−85 11	Nov.	5 46	−84 49	Nov.	7 16	−86 53	Nov.	9 8	−85 19	Nov.	10 59	−84 8
	s	″		s	″		s	″		s	″		s	″
.5	25.47	40.14	0.6	35.99	27.08	0.7	45.48	35.96	0.8	59.89	19.44	0.8	44.40	14.03
.5	25.43	40.45	1.6	36.18	27.30	1.7	45.85	36.06	1.8	60.15	19.40	1.8	44.57	13.84
.5	25.38	40.78	2.6	36.36	27.53	2.7	46.24	36.18	2.8	60.43	19.36	2.8	44.76	13.66
.5	25.31	41.11	3.6	36.55	27.79	3.7	46.64	36.33	3.8	60.73	19.35	3.8	44.96	13.48
.5	25.22	41.45	4.6	36.73	28.07	4.7	47.04	36.50	4.8	61.03	19.36	4.8	45.18	13.33
.4	25.11	41.80	5.6	36.90	28.37	5.7	47.43	36.69	5.8	61.34	19.39	5.8	45.41	13.20
.4	24.98	42.13	6.6	37.04	28.69	6.7	47.79	36.92	6.8	61.64	19.45	6.8	45.64	13.10
.4	24.83	42.42	7.6	37.17	29.01	7.7	48.12	37.16	7.8	61.92	19.54	7.8	45.86	13.02
.4	24.68	42.69	8.6	37.28	29.32	8.7	48.43	37.39	8.8	62.19	19.63	8.8	46.07	12.97
.4	24.54	42.94	9.6	37.38	29.61	9.7	48.71	37.61	9.7	62.44	19.73	9.8	46.28	12.92
.4	24.40	43.18	10.6	37.47	29.89	10.7	48.97	37.81	10.7	62.67	19.82	10.8	46.47	12.87
1.4	24.28	43.41	11.6	37.57	30.14	11.7	49.23	38.00	11.7	62.90	19.88	11.8	46.65	12.81
2.4	24.17	43.64	12.6	37.68	30.38	12.7	49.50	38.16	12.7	63.12	19.93	12.8	46.82	12.73
3.4	24.08	43.90	13.6	37.81	30.63	13.7	49.80	38.32	13.7	63.36	19.98	13.8	47.00	12.64
4.4	23.99	44.18	14.6	37.94	30.89	14.7	50.13	38.50	14.7	63.63	20.01	14.8	47.20	12.53
5.4	23.88	44.47	15.6	38.08	31.17	15.7	50.48	38.69	15.7	63.91	20.05	15.8	47.42	12.42
6.4	23.75	44.78	16.6	38.22	31.48	16.7	50.84	38.91	16.7	64.20	20.12	16.8	47.65	12.33
7.4	23.60	45.10	17.6	38.35	31.81	17.6	51.19	39.16	17.7	64.50	20.21	17.8	47.90	12.25
8.4	23.43	45.40	18.6	38.48	32.16	18.6	51.53	39.42	18.7	64.80	20.33	18.8	48.14	12.20
9.4	23.24	45.70	19.6	38.58	32.52	19.6	51.84	39.70	19.7	65.10	20.47	19.8	48.39	12.16
0.4	23.05	45.97	20.6	38.67	32.88	20.6	52.13	39.99	20.7	65.38	20.62	20.8	48.64	12.15
1.4	22.85	46.22	21.6	38.75	33.22	21.6	52.39	40.28	21.7	65.65	20.78	21.8	48.87	12.15
2.4	22.66	46.45	22.6	38.81	33.57	22.6	52.64	40.57	22.7	65.90	20.94	22.8	49.10	12.16
3.4	22.48	46.67	23.6	38.87	33.90	23.6	52.87	40.84	23.7	66.15	21.10	23.8	49.32	12.18
4.4	22.30	46.88	24.6	38.91	34.22	24.6	53.10	41.11	24.7	66.37	21.26	24.8	49.54	12.20
5.4	22.12	47.08	25.6	38.97	34.52	25.6	53.31	41.37	25.7	66.59	21.41	25.8	49.74	12.21
6.4	21.96	47.28	26.6	39.02	34.81	26.6	53.52	41.61	26.7	66.82	21.55	26.8	49.94	12.22
7.4	21.81	47.48	27.6	39.09	35.11	27.6	53.75	41.85	27.7	67.05	21.68	27.8	50.15	12.22
8.4	21.65	47.70	28.6	39.15	35.41	28.6	53.99	42.10	28.7	67.29	21.81	28.8	50.35	12.21
9.4	21.48	47.94	29.6	39.23	35.72	29.6	54.24	42.35	29.7	67.54	21.95	29.8	50.57	12.20
0.4	21.31	48.18	30.6	39.32	36.06	30.6	54.51	42.61	30.7	67.80	22.10	30.8	50.80	12.19
1.4	21.11	48.43	31.5	39.39	36.40	31.6	54.77	42.91	31.7	68.07	22.27	31.8	51.05	12.20
	11.94	−11.90		11.09	−11.04		18.46	−18.43		12.26	−12.22		9.79	−9.74
	$1^h\ 42^m$	$9^s.88$		$5^h\ 46^m$	$38^s.12$		$7^h\ 17^m$	$0^s.79$		$9^h\ 9^m$	$14^s.21$		$10^h\ 59^m$	$56^s.00$
	85° 11′	57″.70		−84° 49′	49″.43		−86° 53′	53″.55		−85° 19′	28″.08		−84° 8′	11″.87

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

4 Octantis (G.). Mag. 5.6			**31 Mensæ** (G.). Mag. 6.2			**7 Octantis** (G.). Mag. 6.4			**ζ Octantis.** Mag. 5.4			**η Octantis.** Mag. 6.3		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Ded
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Dec.	1 42	−85 11	Dec.	5 46	−84 49	Dec.	7 16	−86 53	Dec.	9 9	−85 19	Dec.	10 59	−84
	s	″		s	″		s	″		s	″		s	
0.4	21.31	48.18	0.6	39.32	36.06	0.6	54.51	42.61	0.7	7.80	22.10	0.8	50.80	12.
1.4	21.11	48.43	1.5	39.39	36.40	1.6	54.77	42.91	1.7	8.07	22.27	1.8	51.05	12.
2.4	20.90	48.68	2.5	39.44	36.79	2.6	55.03	43.23	2.7	8.35	22.47	2.8	51.30	12.
3.4	20.66	48.90	3.5	39.48	37.18	3.6	55.26	43.58	3.7	8.62	22.70	3.8	51.56	12.
4.4	20.41	49.11	4.5	39.50	37.58	4.6	55.46	43.94	4.7	8.87	22.95	4.8	51.81	12.
5.4	20.15	49.29	5.5	39.49	37.96	5.6	55.62	44.30	5.7	9.10	23.21	5.8	52.06	12.
6.4	19.89	49.44	6.5	39.47	38.33	6.6	55.75	44.66	6.7	9.31	23.48	6.8	52.29	12.
7.4	19.65	49.57	7.5	39.44	38.68	7.6	55.85	44.99	7.7	9.51	23.74	7.7	52.50	12.
8.4	19.43	49.68	8.5	39.42	38.99	8.6	55.95	45.30	8.7	9.69	23.99	8.7	52.70	12.
9.4	19.22	49.79	9.5	39.40	39.29	9.6	56.06	45.59	9.7	9.86	24.22	9.7	52.89	13.
10.4	19.02	49.92	10.5	39.39	39.59	10.6	56.18	45.87	10.7	10.04	24.43	10.7	53.09	13.
11.3	18.83	50.08	11.5	39.39	39.89	11.6	56.32	46.16	11.7	10.24	24.64	11.7	53.29	13.
12.3	18.63	50.24	12.5	39.41	40.21	12.6	56.49	46.45	12.7	10.45	24.84	12.7	53.50	13.
13.3	18.41	50.41	13.5	39.42	40.56	13.6	56.67	46.75	13.7	10.68	25.06	13.7	53.73	13.
14.3	18.17	50.59	14.5	39.43	40.92	14.6	56.84	47.09	14.7	10.92	25.30	14.7	53.98	13.
15.3	17.92	50.76	15.5	39.44	41.31	15.6	57.01	47.45	15.7	11.16	25.56	15.7	54.22	13.
16.3	17.66	50.93	16.5	39.42	41.70	16.6	57.16	47.82	16.6	11.39	25.85	16.7	54.47	13.
17.3	17.38	51.07	17.5	39.38	42.09	17.6	57.28	48.20	17.6	11.61	26.16	17.7	54.72	13.
18.3	17.10	51.19	18.5	39.33	42.47	18.6	57.37	48.59	18.6	11.81	26.47	18.7	54.95	14.
19.3	16.83	51.29	19.5	39.28	42.84	19.6	57.44	48.97	19.6	11.99	26.79	19.7	55.18	14.
20.3	16.55	51.37	20.5	39.21	43.20	20.6	57.49	49.34	20.6	12.15	27.10	20.7	55.40	14.
21.3	16.28	51.44	21.5	39.13	43.54	21.6	57.52	49.69	21.6	12.31	27.40	21.7	55.60	14.
22.3	16.03	51.50	22.5	39.05	43.86	22.6	57.55	50.03	22.6	12.46	27.70	22.7	55.79	14.
23.3	15.79	51.55	23.5	38.98	44.17	23.6	57.56	50.36	23.6	12.60	27.99	23.7	55.97	14.
24.3	15.56	51.61	24.5	38.91	44.47	24.5	57.58	50.68	24.6	12.73	28.27	24.7	56.16	15.
25.3	15.33	51.68	25.5	38.84	44.78	25.5	57.63	50.99	25.6	12.88	28.54	25.7	56.34	15.
26.3	15.10	51.75	26.5	38.79	45.10	26.5	57.67	51.31	26.6	13.04	28.81	26.7	56.54	15.
27.3	14.86	51.83	27.5	38.74	45.42	27.5	57.73	51.64	27.6	13.21	29.09	27.7	56.74	15.
28.3	14.61	51.93	28.5	38.68	45.76	28.5	57.80	52.00	28.6	13.38	29.39	28.7	56.95	15.
29.3	14.34	52.02	29.5	38.62	46.13	29.5	57.86	52.37	29.6	13.56	29.71	29.7	57.18	16.
30.3	14.05	52.10	30.5	38.54	46.51	30.5	57.90	52.76	30.6	13.74	30.06	30.7	57.41	16.2
31.3	13.75	52.16	31.5	38.44	46.89	31.5	57.91	53.17	31.6	13.89	30.42	31.7	57.64	16
	11.94	−11.90		11.09	−11.05		18.47	−18.44		12.27	−12.23		9.79	−9.
	1h 42m	9s.88		5h 46m	38s.12		7h 17m	0s.79		9h 9m	14s.21		10h 59m	56s.
	−85° 11′	57″.70		−84° 49′	49″.43		−86° 53′	53″.55		−85° 19′	28″.08		−84° 8′	11″.

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
an lar te.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
n.	12 45	−84 39	Jan.	14 13	−83 16	Jan.	18 4	−87 39	Jan.	19 23	−89 13	Jan.	22 15	−86 24
	s	″		s	″		s	″		s	″		s	″
.8	50.65	27.92	0.8	2.81	36.16	0.9	34.16	56.88	1.0	22.88	52.84	1.1	40.53	19.84
.8	50.90	28.06	1.8	3.01	36.16	1.9	34.45	56.59	2.0	23.18	52.51	2.1	40.35	19.56
.7	51.13	28.18	2.8	3.21	36.17	2.9	34.73	56.31	3.0	23.49	52.18	3.1	40.17	19.30
.7	51.36	28.30	3.8	3.40	36.17	3.9	34.98	56.04	4.0	23.74	51.87	4.1	39.99	19.05
.7	51.59	28.40	4.8	3.59	36.16	4.9	35.22	55.76	5.0	23.91	51.56	5.1	39.80	18.81
.7	51.82	28.49	5.8	3.78	36.14	5.9	35.44	55.47	6.0	24.04	51.25	6.1	39.59	18.58
.7	52.06	28.57	6.8	3.98	36.10	6.9	35.65	55.17	7.0	24.11	50.90	7.1	39.36	18.33
.7	52.32	28.65	7.8	4.19	36.05	7.9	35.88	54.84	8.0	24.17	50.55	8.1	39.12	18.06
.7	52.60	28.75	8.8	4.41	36.01	8.9	36.15	54.49	9.0	24.32	50.16	9.1	38.88	17.76
.7	52.89	28.87	9.8	4.65	35.99	9.9	36.46	54.13	10.0	24.59	49.76	10.1	38.64	17.44
.7	53.18	29.01	10.8	4.90	35.98	10.9	36.80	53.78	11.0	24.97	49.35	11.1	38.41	17.10
.7	53.46	29.18	11.8	5.15	36.00	11.9	37.20	53.44	11.9	25.51	48.95	12.1	38.21	16.74
.7	53.73	29.38	12.8	5.40	36.06	12.9	37.63	53.12	12.9	26.18	48.56	13.1	38.05	16.37
.7	53.99	29.60	13.8	5.63	36.14	13.9	38.07	52.83	13.9	26.94	48.21	14.1	37.92	16.02
.7	54.22	29.81	14.8	5.85	36.23	14.9	38.50	52.57	14.9	27.69	47.89	15.1	37.81	15.68
.7	54.45	30.02	15.8	6.06	36.32	15.9	38.91	52.33	15.9	28.42	47.56	16.1	37.70	15.36
.7	54.66	30.21	16.8	6.26	36.39	16.9	39.28	52.09	16.9	29.08	47.27	17.1	37.59	15.06
.7	54.88	30.39	17.8	6.45	36.46	17.9	39.64	51.85	17.9	29.64	46.96	18.1	37.47	14.78
.7	55.09	30.55	18.8	6.64	36.50	18.9	39.97	51.59	18.9	30.15	46.64	19.1	37.33	14.49
.7	55.32	30.71	19.8	6.85	36.54	19.9	40.31	51.32	19.9	30.61	46.32	20.1	37.17	14.19
.7	55.56	30.87	20.8	7.06	36.57	20.9	40.65	51.04	20.9	31.09	45.98	21.1	37.00	13.88
.7	55.82	31.04	21.8	7.28	36.61	21.9	41.02	50.74	21.9	31.60	45.63	22.1	36.83	13.55
.7	56.08	31.22	22.8	7.51	36.65	22.9	41.41	50.43	22.9	32.19	45.26	23.1	36.66	13.20
.7	56.34	31.42	23.8	7.74	36.71	23.9	41.84	50.13	23.9	32.87	44.88	24.1	36.51	12.84
.7	56.59	31.64	24.8	7.98	36.79	24.9	42.29	49.83	24.9	33.64	44.50	25.1	36.37	12.46
.7	56.85	31.88	25.7	8.22	36.89	25.9	42.78	49.54	25.9	34.54	44.13	26.1	36.25	12.08
.7	57.09	32.14	26.7	8.45	37.02	26.9	43.29	49.28	26.9	35.53	43.76	27.1	36.15	11.68
.7	57.33	32.41	27.7	8.68	37.15	27.9	43.81	49.03	27.9	36.58	43.43	28.1	36.08	11.30
.7	57.55	32.69	28.7	8.91	37.31	28.9	44.34	48.81	28.9	37.69	43.10	29.1	36.03	10.92
.7	57.75	32.97	29.7	9.11	37.47	29.9	44.86	48.60	29.9	38.80	42.81	30.1	35.99	10.56
.7	57.94	33.24	30.7	9.31	37.64	30.9	45.35	48.41	30.9	39.86	42.51	31.1	35.96	10.22
.7	58.13	33.50	31.7	9.50	37.79	31.9	45.82	48.22	31.9	40.87	42.24	32.1	35.92	9.88
10.74		−10.69		8.54	−8.48		24.54	−24.52		74.40	−74.39		15.95	−15.91
2h 45m		55s.22		14h 13m	9s.28		18h 5m	0s.43		19h 24m	31s.66		22h 15m	43s.98
4° 39′		43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Decl
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	
Feb.	12 45	−84 39	Feb.	14 13	−83 16	Feb.	18 4	−87 39	Feb.	19 23	−89 13	Feb.	22 15	−86
	s	″		s	″		s	″		s	″		s	
0.7	58.13	33.50	0.7	9.50	37.79	0.9	45.82	48.22	0.9	40.87	42.24	1.1	35.92	69.
1.7	58.32	33.74	1.7	9.69	37.93	1.9	46.28	48.02	1.9	41.81	41.96	2.1	35.87	69.
2.7	58.51	33.98	2.7	9.88	38.05	2.9	46.72	47.80	2.9	42.69	41.68	3.1	35.80	69.
3.7	58.71	34.21	3.7	10.09	38.17	3.9	47.17	47.57	3.9	43.53	41.36	4.1	35.71	68.
4.7	58.93	34.44	4.7	10.30	38.28	4.9	47.64	47.32	4.9	44.40	41.02	5.1	35.61	68.
5.7	59.17	34.68	5.7	10.53	38.40	5.9	48.13	47.05	5.9	45.35	40.67	6.1	35.51	68.
6.7	59.40	34.95	6.7	10.76	38.54	6.9	48.67	46.79	6.9	46.45	40.29	7.0	35.43	67
7.7	59.64	35.25	7.7	11.00	38.70	7.9	49.26	46.54	7.9	47.68	39.94	8.0	35.37	67
8.6	59.87	35.58	8.7	11.24	38.89	8.9	49.87	46.31	8.9	49.04	39.59	9.0	35.34	66.
9.6	60.08	35.93	9.7	11.47	39.11	9.9	50.51	46.11	9.9	50.49	39.28	10.0	35.35	66
10.6	60.27	36.28	10.7	11.68	39.34	10.9	51.13	45.94	10.9	51.97	38.98	11.0	35.38	66
11.6	60.43	36.63	11.7	11.87	39.58	11.9	51.74	45.79	11.9	53.43	38.72	12.0	35.43	65
12.6	60.59	36.96	12.7	12.06	39.82	12.9	52.32	45.65	12.9	54.82	38.46	13.0	35.47	65
13.6	60.75	37.27	13.7	12.23	40.04	13.9	52.87	45.52	13.9	56.13	38.24	14.0	35.50	64
14.6	60.90	37.56	14.7	12.40	40.24	14.9	53.39	45.37	14.9	57.36	37.99	15.0	35.52	64
15.6	61.06	37.85	15.7	12.58	40.43	15.9	53.91	45.22	15.9	58.55	37.74	16.0	35.53	64
16.6	61.23	38.12	16.7	12.77	40.62	16.8	54.42	45.05	16.9	59.69	37.46	17.0	35.51	63
17.6	61.41	38.40	17.7	12.97	40.79	17.8	54.95	44.86	17.9	60.86	37.17	18.0	35.49	63
18.6	61.59	38.70	18.7	13.17	40.97	18.8	55.49	44.66	18.9	62.08	36.87	19.0	35.47	63
19.6	61.79	39.01	19.7	13.37	41.17	19.8	56.08	44.46	19.9	63.37	36.57	20.0	35.47	62
20.6	61.98	39.34	20.7	13.58	41.38	20.8	56.68	44.27	20.9	64.74	36.26	21.0	35.48	62
21.6	62.16	39.68	21.7	13.79	41.61	21.8	57.31	44.09	21.9	66.22	35.96	22.0	35.51	61
22.6	62.34	40.04	22.7	14.00	41.86	22.8	57.96	43.93	22.9	67.80	35.67	23.0	35.55	61
23.6	62.50	40.41	23.7	14.21	42.13	23.8	58.64	43.79	23.9	69.45	35.41	24.0	35.62	61
24.6	62.65	40.79	24.7	14.40	42.41	24.8	59.31	43.67	24.9	71.14	35.16	24.9	35.72	60
25.6	62.78	41.17	25.7	14.57	42.70	25.8	59.97	43.57	25.9	72.85	34.93	25.9	35.84	60
26.6	62.89	41.55	26.7	14.74	42.99	26.8	60.61	43.49	26.9	74.55	34.73	26.9	35.96	59
27.6	63.01	41.91	27.7	14.90	43.28	27.8	61.23	43.42	27.9	76.16	34.53	27.9	36.08	59
28.6	63.12	42.25	28.7	15.05	43.55	28.8	61.82	43.35	28.9	77.69	34.33	28.9	36.18	59
29.6	63.23	42.59	29.7	15.21	43.80	29.8	62.40	43.27	29.9	79.16	34.14	29.9	36.28	58
30.6	63.35	42.91	30.6	15.38	44.04	30.8	62.96	43.17	30.9	80.57	33.92	30.9	36.35	58
31.6	63.49	43.22	31.6	15.54	44.27	31.8	63.53	43.04	31.9	81.96	33.70	31.9	36.41	58
	10.74	−10.70		8.54	−8.48		24.52	−24.50		74.14	−74.13		15.93	−15.
	$12^h\ 45^m$	$55^s.22$		$14^h\ 13^m$	$9^s.28$		$18^h\ 5^m$	$0^s.43$		$19^h\ 24^m$	$31^s.66$		$22^h\ 15^m$	$43^s.$
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
an lar te.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
r.	12 46	−84 39	Mar.	14 13	−83 16	Mar.	18 5	−87 39	Mar.	19 24	−89 13	Mar.	22 15	−86 23
	s	″		s	″		s	″		s	″		s	″
.6	3.12	42.25	0.7	15.05	43.55	0.8	1.82	43.35	0.9	17.69	34.33	0.9	36.18	59.18
.6	3.23	42.59	1.7	15.21	43.80	1.8	2.40	43.27	1.9	19.16	34.14	1.9	36.28	58.84
.6	3.35	42.91	2.6	15.38	44.04	2.8	2.96	43.17	2.9	20.57	33.92	2.9	36.35	58.49
.6	3.49	43.22	3.6	15.54	44.27	3.8	3.53	43.04	3.9	21.96	33.70	3.9	36.41	58.12
.6	3.63	43.55	4.6	15.72	44.50	4.8	4.13	42.90	4.9	23.43	33.44	4.9	36.46	57.74
.6	3.78	43.91	5.6	15.91	44.75	5.8	4.77	42.76	5.9	25.00	33.16	5.9	36.52	57.33
.6	3.94	44.28	6.6	16.10	45.03	6.8	5.44	42.63	6.9	26.69	32.90	6.9	36.60	56.90
.6	4.09	44.68	7.6	16.30	45.33	7.8	6.15	42.51	7.9	28.51	32.65	7.9	36.71	56.47
.6	4.22	45.09	8.6	16.48	45.65	8.8	6.87	42.43	8.8	30.41	32.42	8.9	36.85	56.04
.6	4.32	45.51	9.6	16.65	45.99	9.8	7.60	42.37	9.8	32.37	32.22	9.9	37.02	55.63
.6	4.42	45.93	10.6	16.81	46.34	10.8	8.31	42.34	10.8	34.30	32.05	10.9	37.21	55.24
.6	4.49	46.34	11.6	16.94	46.68	11.8	8.99	42.33	11.8	36.18	31.89	11.9	37.41	54.88
.6	4.55	46.73	12.6	17.06	47.01	12.8	9.63	42.32	12.8	37.97	31.76	12.9	37.60	54.54
.6	4.61	47.09	13.6	17.19	47.32	13.8	10.23	42.31	13.8	39.66	31.62	13.9	37.77	54.21
.6	4.68	47.44	14.6	17.31	47.62	14.8	10.82	42.29	14.8	41.27	31.47	14.9	37.93	53.89
.6	4.76	47.78	15.6	17.45	47.89	15.8	11.40	42.26	15.8	42.84	31.31	15.9	38.07	53.56
.5	4.84	48.12	16.6	17.58	48.16	16.8	11.98	42.20	16.8	44.40	31.15	16.9	38.19	53.21
.5	4.94	48.46	17.6	17.73	48.44	17.8	12.58	42.13	17.8	45.97	30.95	17.9	38.31	52.86
.5	5.04	48.82	18.6	17.88	48.72	18.8	13.21	42.07	18.8	47.62	30.76	18.9	38.44	52.49
.5	5.14	49.18	19.6	18.04	49.01	19.8	13.86	42.00	19.8	49.35	30.58	19.9	38.58	52.12
.5	5.23	49.57	20.6	18.20	49.32	20.8	14.53	41.95	20.8	51.18	30.39	20.9	38.74	51.73
.5	5.32	49.98	21.6	18.35	49.66	21.8	15.22	41.92	21.8	53.08	30.20	21.9	38.93	51.33
.5	5.40	50.39	22.6	18.49	50.00	22.8	15.93	41.90	22.8	55.04	30.05	22.9	39.12	50.94
.5	5.46	50.81	23.6	18.63	50.36	23.8	16.63	41.91	23.8	57.05	29.91	23.9	39.34	50.57
.5	5.51	51.23	24.6	18.75	50.73	24.8	17.33	41.94	24.8	59.06	29.79	24.9	39.58	50.21
.5	5.54	51.65	25.6	18.87	51.11	25.7	18.01	41.99	25.8	61.07	29.69	25.9	39.84	49.86
.5	5.55	52.06	26.6	18.97	51.48	26.7	18.67	42.05	26.8	63.01	29.61	26.9	40.10	49.54
.5	5.57	52.44	27.6	19.06	51.84	27.7	19.30	42.11	27.8	64.88	29.54	27.9	40.35	49.24
.5	5.58	52.81	28.6	19.15	52.17	28.7	19.90	42.16	28.8	66.65	29.47	28.9	40.58	48.94
.5	5.60	53.15	29.6	19.24	52.49	29.7	20.48	42.19	29.8	68.34	29.38	29.9	40.79	48.64
.5	5.64	53.50	30.6	19.34	52.79	30.7	21.07	42.21	30.8	70.02	29.28	30.9	40.98	48.33
.5	5.69	53.86	31.6	19.46	53.10	31.7	21.66	42.21	31.8	71.70	29.15	31.9	41.16	48.01
10.75		−10.70		8.55	−8.49		24.51	−24.49		73.97	−73.96		15.92	−15.89
2^{h} 45^{m}		$55^{s}.22$		14^{h} 13^{m}	$9^{s}.28$		18^{h} 5^{m}	$0^{s}.43$		19^{h} 24^{m}	$31^{s}.66$		22^{h} 15^{m}	$43^{s}.98$
4° 39′		43 ′.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Apr.	12 46	−84 39	Apr.	14 13	−83 16	Apr.	18 5	−87 39	Apr.	19 25	−89 13	Apr.	22 15	−86 2
	s	″		s	″		s	″		s	″		s	″
0.5	5.69	53.86	0.6	19.46	53.10	0.7	21.66	42.21	0.8	11.70	29.15	0.9	41.16	48.0
1.5	5.75	54.22	1.6	19.58	53.41	1.7	22.29	42.20	1.8	13.46	29.01	1.9	41.35	47.
2.5	5.81	54.61	2.6	19.70	53.74	2.7	22.95	42.19	2.8	15.33	28.87	2.9	41.55	47.
3.5	5.86	55.02	3.6	19.83	54.09	3.7	23.65	42.20	3.8	17.32	28.75	3.9	41.78	46.9
4.5	5.90	55.44	4.6	19.96	54.47	4.7	24.37	42.23	4.8	19.41	28.63	4.9	42.03	46.5
5.5	5.92	55.88	5.6	20.07	54.86	5.7	25.10	42.29	5.8	21.55	28.54	5.9	42.31	46.
6.5	5.92	56.31	6.6	20.16	55.26	6.7	25.80	42.38	6.8	23.68	28.49	6.9	42.62	45.
7.5	5.91	56.73	7.6	20.24	55.66	7.7	26.46	42.50	7.8	25.75	28.45	7.9	42.94	45.
8.5	5.88	57.12	8.5	20.30	56.05	8.7	27.10	42.62	8.8	27.72	28.43	8.9	43.25	45.
9.5	5.84	57.50	9.5	20.36	56.42	9.7	27.69	42.74	9.8	29.60	28.42	9.9	43.54	45.
10.5	5.81	57.85	10.5	20.41	56.76	10.7	28.26	42.85	10.8	31.38	28.41	10.9	43.82	44.7
11.5	5.78	58.19	11.5	20.47	57.09	11.7	28.80	42.95	11.8	33.07	28.39	11.9	44.08	44.5
12.5	5.77	58.53	12.5	20.53	57.41	12.7	29.35	43.03	12.8	34.75	28.35	12.9	44.33	44.
13.5	5.77	58.87	13.5	20.60	57.72	13.7	29.91	43.09	13.8	36.43	28.31	13.9	44.57	43.
14.5	5.78	59.21	14.5	20.68	58.04	14.7	30.48	43.16	14.7	38.17	28.25	14.9	44.80	43.6
15.5	5.79	59.56	15.5	20.77	58.37	15.7	31.08	43.23	15.7	39.96	28.18	15.9	45.05	43.
16.5	5.79	59.93	16.5	20.86	58.71	16.7	31.69	43.30	16.7	41.81	28.12	16.9	45.31	43.
17.5	5.79	60.31	17.5	20.94	59.07	17.7	32.32	43.38	17.7	43.73	28.07	17.9	45.59	42.
18.5	5.77	60.70	18.5	21.02	59.44	18.7	32.97	43.48	18.7	45.73	28.03	18.9	45.89	42.
19.5	5.75	61.10	19.5	21.08	59.82	19.7	33.61	43.61	19.7	47.76	28.02	19.9	46.21	42.
20.5	5.70	61.50	20.5	21.14	60.21	20.7	34.24	43.76	20.7	49.80	28.03	20.9	46.54	41.
21.5	5.64	61.90	21.5	21.18	60.61	21.7	34.86	43.92	21.7	51.83	28.07	21.8	46.89	41.6
22.4	5.57	62.28	22.5	21.21	61.00	22.7	35.46	44.10	22.7	53.80	28.11	22.8	47.24	41.4
23.4	5.49	62.65	23.5	21.24	61.38	23.7	36.02	44.28	23.7	55.68	28.17	23.8	47.58	41.
24.4	5.41	62.99	24.5	21.25	61.74	24.7	36.55	44.46	24.7	57.48	28.23	24.8	47.92	41.0
25.4	5.34	63.31	25.5	21.27	62.09	25.7	37.06	44.63	25.7	59.18	28.29	25.8	48.24	40.8
26.4	5.27	63.62	26.5	21.30	62.41	26.7	37.56	44.77	26.7	60.83	28.32	26.8	48.53	40.6
27.4	5.22	63.93	27.5	21.33	62.72	27.7	38.06	44.90	27.7	62.46	28.33	27.8	48.80	40.4
28.4	5.19	64.26	28.5	21.37	63.04	28.7	38.59	45.02	28.7	64.14	28.33	28.8	49.07	40.1
29.4	5.16	64.60	29.5	21.43	63.38	29.7	39.15	45.13	29.7	65.91	28.31	29.8	49.36	39.9
30.4	5.12	64.95	30.5	21.48	63.73	30.6	39.74	45.25	30.7	67.77	28.31	30.8	49.66	39.6
31.4	5.08	65.33	31.5	21.53	64.10	31.6	40.35	45.39	31.7	69.74	28.32	31.8	49.99	39.
10.76		−10.71	8.55		−8.49	24.51		−24.49	73.88		−73.88	15.91		−15.87
12h 45m		55s.22	14h 13m		9s.28	18h 5m		0s.43	19h 24m		31s.66	22h 15m		43s.98
−84° 39′		43″.10	−83° 16′		47″.50	−87° 39′		52″.55	−89° 13′		43″.28	−86° 24′		3″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
an lar te.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
ry	12 46	−84 40	May	14 13	−83 17	May	18 5	−87 39	May	19 26	−89 13	May	22 15	−86 23
	s	″		s	″		s	″		s	″		s	″
.4	5.12	4.95	0.5	21.48	3.73	0.6	39.74	45.25	0.7	7.77	28.31	0.8	49.66	39.64
.4	5.08	5.33	1.5	21.53	4.10	1.6	40.35	45.39	1.7	9.74	28.32	1.8	49.99	39.38
.4	5.02	5.72	2.5	21.57	4.49	2.6	40.97	45.55	2.7	11.77	28.35	2.8	50.34	39.12
.4	4.94	6.11	3.5	21.59	4.89	3.6	41.58	45.74	3.7	13.81	28.41	3.8	50.72	38.88
.4	4.84	6.48	4.5	21.60	5.30	4.6	42.16	45.97	4.7	15.83	28.51	4.8	51.12	38.68
.4	4.72	6.84	5.5	21.59	5.70	5.6	42.70	46.21	5.7	17.74	28.62	5.8	51.52	38.51
.4	4.60	7.17	6.5	21.58	6.07	6.6	43.19	46.45	6.7	19.52	28.74	6.8	51.90	38.35
7.4	4.48	7.47	7.5	21.56	6.42	7.6	43.64	46.68	7.7	21.18	28.87	7.8	52.25	38.21
8.4	4.37	7.75	8.5	21.53	6.75	8.6	44.07	46.90	8.7	22.74	28.99	8.8	52.59	38.07
9.4	4.26	8.03	9.5	21.51	7.05	9.6	44.49	47.09	9.7	24.25	29.08	9.8	52.91	37.94
0.4	4.17	8.30	10.5	21.51	7.34	10.6	44.91	47.27	10.7	25.75	29.17	10.8	53.22	37.79
1.4	4.07	8.57	11.5	21.51	7.64	11.6	45.35	47.45	11.7	27.26	29.24	11.8	53.52	37.64
2.4	3.99	8.86	12.5	21.51	7.94	12.6	45.80	47.62	12.7	28.82	29.31	12.8	53.83	37.47
3.4	3.91	9.15	13.5	21.52	8.26	13.6	46.27	47.78	13.7	30.45	29.37	13.8	54.14	37.29
4.4	3.82	9.46	14.4	21.53	8.59	14.6	46.75	47.96	14.7	32.13	29.45	14.8	54.47	37.11
5.4	3.73	9.77	15.4	21.53	8.93	15.6	47.25	48.17	15.7	33.87	29.54	15.8	54.83	36.94
6.4	3.62	10.10	16.4	21.52	9.28	16.6	47.75	48.39	16.7	35.64	29.65	16.8	55.20	36.77
7.4	3.50	10.42	17.4	21.50	9.64	17.6	48.24	48.63	17.7	37.42	29.78	17.8	55.58	36.62
8.4	3.36	10.73	18.4	21.48	10.01	18.6	48.72	48.89	18.7	39.20	29.93	18.8	55.98	36.49
9.4	3.22	11.04	19.4	21.44	10.37	19.6	49.17	49.16	19.7	40.92	30.09	19.8	56.39	36.37
0.4	3.06	11.32	20.4	21.38	10.72	20.6	49.58	49.45	20.7	42.56	30.27	20.8	56.79	36.28
1.4	2.90	11.58	21.4	21.33	11.05	21.6	49.96	49.73	21.6	44.09	30.46	21.8	57.18	36.21
2.4	2.74	11.83	22.4	21.27	11.36	22.6	50.32	50.00	22.6	45.52	30.65	22.8	57.54	36.14
3.4	2.59	12.06	23.4	21.21	11.65	23.6	50.65	50.25	23.6	46.87	30.81	23.8	57.89	36.08
4.4	2.45	12.28	24.4	21.16	11.93	24.6	50.97	50.48	24.6	48.19	30.97	24.8	58.21	36.01
5.4	2.33	12.51	25.4	21.13	12.20	25.6	51.31	50.69	25.6	49.51	31.09	25.8	58.52	35.92
6.4	2.22	12.75	26.4	21.10	12.48	26.6	51.68	50.89	26.6	50.91	31.21	26.8	58.83	35.80
7.4	2.11	13.00	27.4	21.08	12.77	27.6	52.08	51.10	27.6	52.38	31.32	27.7	59.16	35.68
8.4	2.00	13.27	28.4	21.06	13.08	28.6	52.50	51.32	28.6	53.95	31.45	28.7	59.51	35.55
9.3	1.87	13.55	29.4	21.04	13.41	29.6	52.94	51.57	29.6	55.60	31.59	29.7	59.89	35.43
0.3	1.73	13.84	30.4	20.99	13.76	30.6	53.38	51.84	30.6	57.28	31.76	30.7	60.29	35.32
1.3	1.56	14.13	31.4	20.93	14.11	31.6	53.79	52.14	31.6	58.94	31.96	31.7	60.71	35.24

ι Octantis		δ Octantis		χ Octantis		σ Octantis		υ Octantis	
10.76	−10.72	8.55	−8.49	24.53	−24.51	73.92	−73.91	15.90	−15.87
$12^h\ 45^m$	$55^s.22$	$14^h\ 13^m$	$9^s.28$	$18^h\ 5^m$	$0^s.43$	$19^h\ 24^m$	$31^s.66$	$22^h\ 15^m$	$43^s.98$
84° 39′	43″.10	−83° 16′	47″.50	−87° 39′	52″.55	−89° 13′	43″.28	−86° 24′	3″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	De
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
June	12 45	−84 40	June	14 13	−83 17	June	18 5	−87 39	June	19 26	−89 13	June	22 16	−86
	s	″		s	″		s	″		s	″		s	
0.3	61.56	14.13	0.4	20.93	14.11	0.6	53.79	52.14	0.6	58.94	31.96	0.7	0.71	35
1.3	61.37	14.40	1.4	20.86	14.45	1.6	54.16	52.46	1.6	60.50	32.18	1.7	1.13	35
2.3	61.17	14.63	2.4	20.77	14.77	2.6	54.47	52.78	2.6	61.92	32.43	2.7	1.53	35
3.3	60.98	14.84	3.4	20.67	15.07	3.6	54.75	53.09	3.6	63.22	32.66	3.7	1.92	35
4.3	60.80	15.03	4.4	20.58	15.34	4.6	55.00	53.39	4.6	64.42	32.90	4.7	2.28	35
5.3	60.62	15.19	5.4	20.49	15.58	5.6	55.23	53.67	5.6	65.52	33.11	5.7	2.62	35
6.3	60.45	15.35	6.4	20.40	15.82	6.5	55.44	53.93	6.6	66.57	33.33	6.7	2.94	35
7.3	60.29	15.52	7.4	20.32	16.05	7.5	55.67	54.18	7.6	67.62	33.51	7.7	3.25	35
8.3	60.15	15.68	8.4	20.25	16.28	8.5	55.91	54.42	8.6	68.70	33.69	8.7	3.57	35
9.3	60.01	15.85	9.4	20.19	16.52	9.5	56.17	54.66	9.6	69.83	33.88	9.7	3.89	35
10.3	59.86	16.03	10.4	20.13	16.76	10.5	56.44	54.90	10.6	71.00	34.06	10.7	4.22	35
11.3	59.71	16.23	11.4	20.06	17.02	11.5	56.72	55.16	11.6	72.23	34.25	11.7	4.57	35
12.3	59.54	16.43	12.4	19.99	17.29	12.5	57.00	55.45	12.6	73.51	34.46	12.7	4.93	35
13.3	59.36	16.63	13.4	19.90	17.57	13.5	57.27	55.75	13.6	74.79	34.69	13.7	5.30	35
14.3	59.17	16.82	14.4	19.80	17.85	14.5	57.54	56.06	14.6	76.07	34.93	14.7	5.69	35
15.3	58.97	17.01	15.4	19.70	18.13	15.5	57.78	56.39	15.6	77.29	35.20	15.7	6.08	35
16.3	58.75	17.17	16.4	19.58	18.40	16.5	57.98	56.72	16.6	78.43	35.48	16.7	6.48	35
17.3	58.53	17.32	17.4	19.46	18.65	17.5	58.15	57.06	17.6	79.46	35.76	17.7	6.86	35
18.3	58.31	17.44	18.4	19.33	18.88	18.5	58.28	57.39	18.6	80.38	36.05	18.7	7.22	35
19.3	58.10	17.54	19.4	19.20	19.09	19.5	58.38	57.70	19.6	81.18	36.33	19.7	7.55	35
20.3	57.91	17.63	20.3	19.08	19.27	20.5	58.47	57.98	20.6	81.93	36.58	20.7	7.86	35
21.3	57.73	17.72	21.3	18.97	19.44	21.5	58.57	58.25	21.6	82.67	36.81	21.7	8.15	35
22.3	57.57	17.82	22.3	18.88	19.61	22.5	58.69	58.50	22.6	83.44	37.02	22.7	8.43	35
23.3	57.41	17.92	23.3	18.79	19.79	23.5	58.84	58.75	23.6	84.28	37.22	23.7	8.72	35
24.3	57.25	18.05	24.3	18.71	20.00	24.5	59.02	59.00	24.6	85.23	37.43	24.7	9.03	35
25.3	57.08	18.19	25.3	18.61	20.22	25.5	59.22	59.28	25.6	86.26	37.65	25.7	9.36	35
26.3	56.90	18.34	26.3	18.51	20.44	26.5	59.41	59.58	26.6	87.34	37.91	26.7	9.72	35
27.3	56.69	18.49	27.3	18.40	20.71	27.5	59.59	59.91	27.5	88.41	38.18	27.7	10.10	35
28.3	56.47	18.63	28.3	18.27	20.95	28.5	59.74	60.26	28.5	89.38	38.48	28.7	10.48	35
29.3	56.23	18.74	29.3	18.13	21.17	29.5	59.84	60.61	29.5	90.22	38.79	29.7	10.85	35
30.3	56.00	18.82	30.3	17.98	21.37	30.5	59.89	60.96	30.5	90.94	39.11	30.7	11.21	36
31.3	55.77	18.87	31.3	17.82	21.54	31.5	59.90	61.30	31.5	91.52	39.43	31.7	11.53	36
	10.77	−10.72		8.56	−8.50		24.55	−24.53		74.07	−74.06		15.90	−15
	$12^h\ 45^m$	$55^s.22$		$14^h\ 13^m$	$9^s.28$		$18^h\ 5^m$	$0^s.43$		$19^h\ 24^m$	$31^s.66$		$22^h\ 15^m$	43
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
an lar te.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
ly	12 45	−84 40	July	14 13	−83 17	July	18 5	−87 40	July	19 27	−89 13	July	22 16	−86 23
	s	″		s	″		s	″		s	″		s	″
.3	56.00	18.82	0.3	17.98	21.37	0.5	59.89	0.96	0.5	30.94	39.11	0.7	11.21	36.03
.3	55.77	18.87	1.3	17.82	21.54	1.5	59.90	1.30	1.5	31.52	39.43	1.7	11.53	36.18
.3	55.55	18.90	2.3	17.67	21.68	2.5	59.88	1.61	2.5	32.00	39.75	2.7	11.83	36.33
.3	55.35	18.92	3.3	17.53	21.81	3.5	59.86	1.90	3.5	32.43	40.02	3.6	12.11	36.48
.2	55.15	18.94	4.3	17.40	21.92	4.5	59.83	2.17	4.5	32.81	40.30	4.6	12.37	36.62
5.2	54.97	18.95	5.3	17.28	22.03	5.5	59.81	2.43	5.5	33.22	40.54	5.6	12.62	36.75
6.2	54.80	18.97	6.3	17.16	22.14	6.5	59.81	2.69	6.5	33.65	40.79	6.6	12.88	36.86
7.2	54.62	19.01	7.3	17.04	22.27	7.5	59.82	2.95	7.5	34.14	41.04	7.6	13.14	36.97
8.2	54.43	19.05	8.3	16.92	22.40	8.5	59.84	3.22	8.5	34.66	41.29	8.6	13.42	37.08
9.2	54.24	19.10	9.3	16.79	22.54	9.5	59.88	3.51	9.5	35.22	41.56	9.6	13.71	37.20
0.2	54.04	19.15	10.3	16.65	22.70	10.5	59.90	3.81	10.5	35.81	41.84	10.6	14.02	37.32
1.2	53.82	19.20	11.3	16.51	22.85	11.5	59.91	4.12	11.5	36.38	42.14	11.6	14.33	37.46
2.2	53.60	19.24	12.3	16.36	23.01	12.4	59.91	4.45	12.5	36.93	42.45	12.6	14.65	37.62
3.2	53.38	19.26	13.3	16.20	23.15	13.4	59.88	4.79	13.5	37.39	42.78	13.6	14.96	37.79
4.2	53.14	19.26	14.3	16.03	23.28	14.4	59.80	5.12	14.5	37.74	43.12	14.6	15.27	37.99
5.2	52.89	19.24	15.3	15.86	23.38	15.4	59.69	5.45	15.5	37.98	43.45	15.6	15.55	38.20
6.2	52.66	19.20	16.3	15.68	23.46	16.4	59.55	5.76	16.5	38.10	43.78	16.6	15.81	38.43
7.2	52.45	19.14	17.3	15.52	23.52	17.4	59.39	6.05	17.5	38.13	44.08	17.6	16.05	38.65
8.2	52.26	19.07	18.3	15.36	23.56	18.4	59.23	6.32	18.5	38.10	44.38	18.6	16.26	38.86
9.2	52.08	19.00	19.3	15.22	23.59	19.4	59.08	6.57	19.5	38.09	44.64	19.6	16.45	39.05
0.2	51.91	18.94	20.3	15.09	23.63	20.4	58.95	6.80	20.5	38.15	44.90	20.6	16.65	39.22
1.2	51.74	18.91	21.3	14.96	23.68	21.4	58.86	7.03	21.5	38.29	45.14	21.6	16.86	39.37
2.2	51.57	18.89	22.3	14.84	23.75	22.4	58.80	7.27	22.5	38.52	45.40	22.6	17.08	39.51
3.2	51.40	18.89	23.3	14.71	23.85	23.4	58.74	7.54	23.5	38.82	45.66	23.6	17.33	39.67
4.2	51.20	18.88	24.3	14.57	23.95	24.4	58.67	7.83	24.5	39.13	45.95	24.6	17.60	39.84
5.2	50.98	18.86	25.3	14.41	24.05	25.4	58.58	8.14	25.5	39.39	46.28	25.6	17.88	40.04
6.2	50.75	18.83	26.2	14.23	24.14	26.4	58.44	8.46	26.5	39.53	46.61	26.6	18.15	40.27
7.2	50.52	18.76	27.2	14.06	24.20	27.4	58.26	8.78	27.5	39.54	46.96	27.6	18.40	40.52
28.2	50.29	18.67	28.2	13.87	24.24	28.4	58.03	9.09	28.5	39.42	47.29	28.6	18.63	40.79
29.2	50.07	18.56	29.2	13.69	24.24	29.4	57.77	9.38	29.5	39.16	47.62	29.6	18.83	41.06
30.2	49.86	18.43	30.2	13.52	24.22	30.4	57.49	9.64	30.5	38.83	47.93	30.6	18.99	41.33
31.2	49.67	18.29	31.2	13.35	24.19	31.4	57.21	9.88	31.5	38.43	48.22	31.6	19.14	41.59
	10.77	−10.72		8.56	−8.50		24.58	−24.56		74.29	−74.28		15.90	−15.87
	12^h 45^m	55^s.22		14^h 13^m	9^s.28		18^h 5^m	0^s.43		19^h 24^m	31^s.66		22^h 15^m	43^s.98
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Aug.	12 45	−84 40	Aug.	14 13	−83 17	Aug.	18 5	−87 40	Aug.	19 27	−89 13	Aug.	22 16	−86
	s	″		s	″		s	″		s	″		s	″
0.2	49.67	18.29	0.2	13.35	24.19	0.4	57.21	9.88	0.5	38.43	48.22	0.6	19.14	41.5
1.2	49.50	18.15	1.2	13.20	24.16	1.4	56.94	10.10	1.5	38.05	48.48	1.6	19.28	41.8
2.2	49.33	18.02	2.2	13.05	24.12	2.4	56.68	10.32	2.4	37.68	48.74	2.6	19.42	42.0
3.2	49.17	17.90	3.2	12.91	24.09	3.4	56.44	10.53	3.4	37.37	48.99	3.6	19.55	42.3
4.2	49.01	17.78	4.2	12.77	24.07	4.4	56.22	10.74	4.4	37.09	49.24	4.6	19.70	42.5
5.2	48.84	17.68	5.2	12.63	24.05	5.4	56.01	10.97	5.4	36.85	49.50	5.6	19.85	42.7
6.2	48.66	17.58	6.2	12.48	24.05	6.4	55.79	11.21	6.4	36.64	49.78	6.6	20.02	42.9
7.2	48.48	17.48	7.2	12.33	24.05	7.4	55.57	11.46	7.4	36.44	50.07	7.6	20.20	43.
8.2	48.29	17.37	8.2	12.17	24.06	8.4	55.33	11.72	8.4	36.20	50.37	8.5	20.39	43.4
9.2	48.08	17.26	9.2	12.00	24.06	9.4	55.07	11.99	9.4	35.91	50.68	9.5	20.58	43.7
10.1	47.87	17.12	10.2	11.82	24.03	10.4	54.77	12.26	10.4	35.52	50.99	10.5	20.76	44.0
11.1	47.66	16.95	11.2	11.63	23.99	11.4	54.44	12.52	11.4	35.03	51.32	11.5	20.92	44.3
12.1	47.46	16.77	12.2	11.45	23.93	12.4	54.08	12.77	12.4	34.41	51.64	12.5	21.05	44.6
13.1	47.28	16.57	13.2	11.27	23.84	13.4	53.69	13.00	13.4	33.68	51.94	13.5	21.15	44.9
14.1	47.11	16.36	14.2	11.10	23.73	14.4	53.29	13.20	14.4	32.89	52.21	14.5	21.22	45.2
15.1	46.96	16.14	15.2	10.95	23.61	15.4	52.91	13.38	15.4	32.11	52.45	15.5	21.28	45.53
16.1	46.82	15.93	16.2	10.81	23.49	16.4	52.55	13.53	16.4	31.35	52.68	16.5	21.33	45.79
17.1	46.69	15.75	17.2	10.69	23.39	17.4	52.22	13.68	17.4	30.67	52.89	17.5	21.38	46.0
18.1	46.57	15.58	18.2	10.56	23.30	18.3	51.92	13.84	18.4	30.08	53.11	18.5	21.44	46.2
19.1	46.43	15.43	19.2	10.43	23.23	19.3	51.63	14.01	19.4	29.56	53.33	19.5	21.53	46.4
20.1	46.29	15.28	20.2	10.30	23.17	20.3	51.35	14.20	20.4	29.09	53.58	20.5	21.64	46.73
21.1	46.13	15.13	21.2	10.14	23.12	21.3	51.05	14.42	21.4	28.61	53.83	21.5	21.76	46.99
22.1	45.96	14.96	22.2	9.98	23.06	22.3	50.72	14.64	22.4	28.04	54.12	22.5	21.88	47.28
23.1	45.77	14.77	23.2	9.81	22.98	23.3	50.34	14.87	23.4	27.33	54.41	23.5	21.99	47.59
24.1	45.59	14.56	24.2	9.64	22.87	24.3	49.93	15.08	24.4	26.49	54.72	24.5	22.07	47.92
25.1	45.42	14.31	25.2	9.46	22.73	25.3	49.47	15.27	25.4	25.52	55.00	25.5	22.12	48.25
26.1	45.27	14.05	26.2	9.30	22.57	26.3	48.99	15.43	26.4	24.45	55.25	26.5	22.13	48.58
27.1	45.13	13.78	27.2	9.14	22.40	27.3	48.51	15.58	27.4	23.33	55.50	27.5	22.13	48.91
28.1	45.01	13.51	28.2	9.00	22.21	28.3	48.05	15.70	28.4	22.21	55.70	28.5	22.12	49.22
29.1	44.90	13.25	29.2	8.87	22.02	29.3	47.60	15.81	29.4	21.11	55.91	29.5	22.09	49.51
30.1	44.80	13.00	30.2	8.75	21.84	30.3	47.16	15.91	30.4	20.04	56.10	30.5	22.06	49.78
31.1	44.71	12.76	31.2	8.63	21.67	31.3	46.75	16.00	31.4	19.03	56.28	31.5	22.04	50.05
	10.76	−10.72		8.56	−8.50		24.60	−24.58		74.53	−74.53		15.91	−15.88
	$12^h\ 45^m$	$55^s.22$		$14^h\ 13^m$	$9^s.28$		$18^h\ 5^m$	$0^s.43$		$19^h\ 24^m$	$31^s.66$		$22^h\ 15^m$	$43^s.98$
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
an lar te.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
pt.	12 45	−84 40	Sept.	14 13	−83 17	Sept.	18 5	−87 40	Sept.	19 26	−89 13	Sept.	22 16	−86 23
	s	″		s	″		s	″		s	″		s	″
.1	44.71	12.76	0.2	8.63	21.67	0.3	46.75	16.00	0.4	79.03	56.28	0.5	22.04	50.05
.1	44.62	12.53	1.1	8.51	21.51	1.3	46.36	16.11	1.4	78.07	56.46	1.5	22.03	50.32
.1	44.51	12.30	2.1	8.38	21.36	2.3	45.97	16.23	2.4	77.14	56.66	2.5	22.03	50.59
3.1	44.39	12.08	3.1	8.25	21.22	3.3	45.57	16.35	3.4	76.24	56.86	3.5	22.04	50.87
4.1	44.27	11.85	4.1	8.12	21.07	4.3	45.16	16.49	4.4	75.31	57.08	4.5	22.06	51.15
5.1	44.14	11.62	5.1	7.98	20.92	5.3	44.74	16.64	5.4	74.34	57.31	5.5	22.07	51.45
6.1	44.01	11.37	6.1	7.83	20.76	6.3	44.29	16.78	6.4	73.29	57.54	6.5	22.08	51.77
7.1	43.88	11.11	7.1	7.68	20.59	7.3	43.81	16.92	7.4	72.18	57.77	7.5	22.08	52.09
8.1	43.76	10.83	8.1	7.53	20.39	8.3	43.30	17.05	8.3	70.95	58.00	8.5	22.05	52.43
9.1	43.65	10.53	9.1	7.39	20.17	9.3	42.77	17.16	9.3	69.61	58.22	9.5	21.99	52.77
0.1	43.56	10.22	10.1	7.25	19.93	10.3	42.24	17.24	10.3	68.20	58.40	10.5	21.90	53.10
1.1	43.48	9.90	11.1	7.13	19.68	11.3	41.71	17.29	11.3	66.76	58.57	11.5	21.80	53.40
2.1	43.42	9.59	12.1	7.02	19.42	12.3	41.20	17.31	12.3	65.34	58.70	12.5	21.68	53.69
3.1	43.38	9.30	13.1	6.93	19.18	13.3	40.72	17.32	13.3	63.99	58.80	13.5	21.55	53.95
4.1	43.35	9.03	14.1	6.85	18.95	14.3	40.28	17.33	14.3	62.76	58.90	14.4	21.43	54.19
15.0	43.31	8.77	15.1	6.77	18.73	15.3	39.87	17.35	15.3	61.61	59.03	15.4	21.33	54.43
16.0	43.25	8.53	16.1	6.68	18.53	16.3	39.46	17.39	16.3	60.52	59.15	16.4	21.26	54.67
17.0	43.19	8.29	17.1	6.58	18.35	17.3	39.06	17.45	17.3	59.46	59.29	17.4	21.21	54.92
18.0	43.11	8.05	18.1	6.47	18.17	18.3	38.63	17.53	18.3	58.34	59.46	18.4	21.16	55.19
19.0	43.03	7.78	19.1	6.35	17.97	19.3	38.16	17.62	19.3	57.12	59.64	19.4	21.09	55.49
20.0	42.94	7.49	20.1	6.23	17.75	20.3	37.65	17.69	20.3	55.76	59.81	20.4	21.01	55.80
21.0	42.86	7.17	21.1	6.10	17.51	21.3	37.10	17.74	21.3	54.30	59.98	21.4	20.90	56.12
22.0	42.80	6.83	22.1	5.99	17.23	22.3	36.53	17.77	22.3	52.72	60.13	22.4	20.76	56.45
23.0	42.75	6.49	23.1	5.89	16.94	23.2	35.97	17.77	23.3	51.11	60.25	23.4	20.59	56.76
24.0	42.73	6.15	24.1	5.80	16.63	24.2	35.40	17.75	24.3	49.46	60.35	24.4	20.41	57.05
25.0	42.72	5.82	25.1	5.73	16.33	25.2	34.86	17.70	25.3	47.83	60.42	25.4	20.21	57.32
26.0	42.73	5.50	26.1	5.67	16.04	26.2	34.35	17.65	26.3	46.27	60.47	26.4	20.01	57.58
27.0	42.74	5.18	27.1	5.61	15.75	27.2	33.86	17.59	27.3	44.77	60.53	27.4	19.81	57.81
28.0	42.74	4.88	28.1	5.56	15.47	28.2	33.39	17.54	28.3	43.33	60.57	28.4	19.63	58.04
29.0	42.75	4.60	29.1	5.51	15.21	29.2	32.93	17.49	29.3	41.95	60.62	29.4	19.46	58.27
30.0	42.75	4.32	30.1	5.45	14.96	30.2	32.48	17.45	30.3	40.60	60.69	30.4	19.29	58.50
31.0	42.74	4.05	31.1	5.38	14.71	31.2	32.03	17.43	31.3	39.26	60.76	31.4	19.14	58.74

ι Octantis		δ Octantis		χ Octantis		σ Octantis		υ Octantis	
10.76	−10.72	8.56	−8.50	24.61	−24.59	74.71	−74.70	15.92	−15.89
12h 45m	55s.22	14h 13m	9s.28	18h 5m	0s.43	19h 24m	31s.66	22h 15m	43s.98
−84° 39′	43″.10	−83° 16′	47″.50	−87° 39′	52″.55	−89° 13′	43″.28	−86° 24′	3″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	**Right Ascension.**	**Declination *South.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *South.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *South.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *South.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *South.***
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Oct.	12 45	−84 39	Oct.	14 13	−83 17	Oct.	18 5	−87 40	Oct.	19 25	−89 13	Oct.	22 16	−86 2
	s	″		s	″		s	″		s	″		s	″
1.0	42.74	64.05	1.1	5.38	14.71	1.2	32.03	17.43	1.3	99.26	60.76	1.4	19.14	58.7
2.0	42.73	63.77	2.1	5.31	14.46	2.2	31.57	17.41	2.3	97.90	60.84	2.4	18.99	58.9
3.0	42.71	63.48	3.1	5.24	14.21	3.2	31.10	17.40	3.3	96.50	60.93	3.4	18.84	59.2
3.9	42.69	63.18	4.1	5.16	13.96	4.2	30.61	17.38	4.3	95.03	61.02	4.4	18.67	59.5
4.9	42.68	62.86	5.1	5.09	13.68	5.2	30.09	17.35	5.3	93.48	61.10	5.4	18.50	59.7
5.9	42.68	62.54	6.1	5.01	13.38	6.2	29.54	17.31	6.3	91.84	61.18	6.4	18.30	60.0
6.9	42.69	62.20	7.1	4.95	13.06	7.2	28.98	17.23	7.3	90.12	61.22	7.4	18.06	60.3
7.9	42.72	61.85	8.0	4.90	12.72	8.2	28.44	17.14	8.3	88.36	61.25	8.4	17.80	60.5
8.9	42.77	61.51	9.0	4.87	12.39	9.2	27.92	17.01	9.3	86.63	61.23	9.4	17.52	60.8
9.9	42.84	61.18	10.0	4.85	12.05	10.2	27.43	16.86	10.3	84.96	61.20	10.4	17.24	61.0
10.9	42.92	60.88	11.0	4.84	11.74	11.2	26.97	16.71	11.3	83.42	61.14	11.4	16.97	61.1
11.9	43.00	60.61	12.0	4.84	11.45	12.2	26.56	16.56	12.3	81.98	61.10	12.4	16.71	61.3
12.9	43.07	60.36	13.0	4.85	11.18	13.2	26.18	16.42	13.3	80.65	61.05	13.4	16.47	61.4
13.9	43.14	60.11	14.0	4.84	10.92	14.2	25.80	16.31	14.2	79.35	61.03	14.4	16.26	61.6
14.9	43.19	59.86	15.0	4.82	10.67	15.2	25.41	16.22	15.2	78.03	61.02	15.4	16.06	61.8
15.9	43.23	59.60	16.0	4.79	10.41	16.2	24.98	16.13	16.2	76.66	61.02	16.4	15.85	62.0
16.9	43.26	59.32	17.0	4.76	10.14	17.2	24.52	16.05	17.2	75.19	61.06	17.4	15.64	62.2
17.9	43.30	59.02	18.0	4.72	9.84	18.2	24.04	15.96	18.2	73.60	61.06	18.4	15.40	62.4
18.9	43.35	58.70	19.0	4.69	9.52	19.2	23.53	15.83	19.2	71.92	61.05	19.4	15.14	62.6
19.9	43.42	58.37	20.0	4.68	9.18	20.2	23.01	15.68	20.2	70.18	61.00	20.3	14.84	62.91
20.9	43.51	58.03	21.0	4.67	8.84	21.2	22.50	15.50	21.2	68.42	60.95	21.3	14.52	63.11
21.9	43.62	57.70	22.0	4.69	8.48	22.2	22.02	15.30	22.2	66.68	60.86	22.3	14.20	63.27
22.9	43.75	57.39	23.0	4.71	8.13	23.2	21.56	15.09	23.2	65.02	60.76	23.3	13.86	63.43
23.9	43.87	57.09	24.0	4.74	7.81	24.2	21.14	14.88	24.2	63.42	60.65	24.3	13.54	63.56
24.9	44.00	56.82	25.0	4.78	7.49	25.2	20.75	14.66	25.2	61.91	60.53	25.3	13.22	63.67
25.9	44.13	56.55	25.9	4.82	7.19	26.2	20.37	14.45	26.2	60.49	60.41	26.3	12.92	63.78
26.9	44.25	56.31	26.9	4.86	6.90	27.2	20.01	14.26	27.2	59.11	60.31	27.3	12.63	63.90
27.9	44.37	56.08	27.9	4.90	6.63	28.2	19.66	14.07	28.2	57.77	60.20	28.3	12.36	64.00
28.9	44.48	55.84	28.9	4.93	6.36	29.2	19.32	13.89	29.2	56.45	60.11	29.3	12.09	64.13
29.9	44.59	55.60	29.9	4.95	6.09	30.1	18.96	13.72	30.2	55.10	60.03	30.3	11.82	64.26
30.9	44.69	55.35	30.9	4.98	5.81	31.1	18.58	13.55	31.2	53.71	59.95	31.3	11.55	64.39
31.9	44.79	55.08	31.9	4.99	5.52	32.1	18.18	13.37	32.2	52.26	59.86	32.3	11.27	64.53
	10.76	−10.71		8.55	−8.50		24.61	−24.59		74.76	−74.76		15.93	−15.90
	12h 45m	55s.22		14h 13m	9s.28		18h 5m	0s.43		19h 24m	31s.66		22h 15m	43s.08
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
ean lar ate.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
ov.	12 45	−84 39	Nov.	14 13	−83 16	Nov.	18 5	−87 40	Nov.	19 25	−89 13	Nov.	22 16	−86 24
	s	″		s	″		s	″		s	″		s	″
0.9	44.79	55.08	0.9	4.99	65.52	1.1	18.18	13.37	1.2	52.26	59.86	1.3	11.27	4.53
1.9	44.90	54.80	1.9	5.02	65.22	2.1	17.77	13.18	2.2	50.73	59.77	2.3	10.96	4.67
2.9	45.02	54.52	2.9	5.05	64.90	3.1	17.35	12.97	3.2	49.13	59.66	3.3	·10.63	4.81
3.9	45.17	54.23	3.9	5.10	64.56	4.1	16.93	12.73	4.2	47.52	59.52	4.3	10.28	4.93
4.9	45.33	53.95	4.9	5.16	64.23	5.1	16.54	12.47	5.2	45.92	59.35	5.3	9.91	5.03
5.9	45.51	53.68	5.9	5.23	63.90	6.1	16.18	12.18	6.2	44.38	59.16	6.3	9.54	5.10
6.9	45.71	53.44	6.9	5.33	63.59	7.1	15.86	11.89	7.2	42.98	58.94	7.3	9.18	5.14
7.9	45.90	53.22	7.9	5.43	63.29	8.1	15.59	11.60	8.2	41.70	58.72	8.3	8.83	5.16
8.9	46.10	53.03	8.9	5.53	63.02	9.1	15.36	11.32	9.2	40.53	58.50	9.3	8.50	5.16
9.9	46.29	52.86	9.9	5.62	62.77	10.1	15.13	11.06	10.2	39.44	58.31	10.3	8.19	5.17
0.9	46.46	52.70	10.9	5.71	62.55	11.1	14.92	10.82	11.2	38.41	58.12	11.3	7.91	5.18
1.9	46.61	52.53	11.9	5.79	62.32	12.1	14.69	10.60	12.2	37.34	57.97	12.3	7.64	5.22
12.9	46.75	52.35	12.9	5.86	62.08	13.1	14.44	10.39	13.2	36.18	57.82	13.3	7.36	5.28
13.9	46.90	52.15	13.9	5.92	61.82	14.1	14.15	10.16	14.2	34.93	57.68	14.3	7.07	5.34
14.9	47.05	51.92	14.9	5.98	61.54	15.1	13.83	9.92	15.2	33.60	57.51	15.3	6.74	5.42
15.9	47.22	51.68	15.9	6.06	61.25	16.1	13.51	9.66	16.2	32.21	57.32	16.3	6.39	5.48
16.9	47.41	51.45	16.9	6.15	60.94	17.1	13.20	9.37	17.2	30.79	57.11	17.3	6.03	5.52
17.9	47.62	51.22	17.9	6.26	60.63	18.1	12.90	9.05	18.2	29.39	56.87	18.3	5.65	5.54
18.9	47.84	51.01	18.9	6.38	60.33	19.1	12.64	8.72	19.1	28.08	56.62	19.3	5.26	5.53
19.9	48.07	50.81	19.9	6.51	60.04	20.1	12.41	8.39	20.1	26.86	56.35	20.3	4.88	5.52
20.9	48.30	50.64	20.9	6.64	59.77	21.1	12.23	8.05	21.1	25.72	56.08	21.3	4.51	5.47
21.9	48.53	50.49	21.9	6.78	59.52	22.1	12.07	7.72	22.1	24.69	55.80	22.3	4.16	5.42
22.9	48.76	50.35	22.9	6.92	59.29	23.1	11.93	7.41	23.1	23.74	55.54	23.3	3.82	5.36
23.9	48.97	50.22	23.9	7.05	59.07	24.1	11.80	7.11	24.1	22.85	55.28	24.3	3.50	5.29
24.9	49.18	50.10	24.9	7.18	58.86	25.1	11.67	6.82	25.1	21.97	55.03	25.3	3.19	5.24
25.9	49.39	49.98	25.9	7.31	58.65	26.1	11.55	6.55	26.1	21.11	54.80	26.2	2.90	5.19
26.9	49.58	49.86	26.9	7.42	58.45	27.1	11.42	6.28	27.1	20.23	54.58	27.2	2.61	5.15
27.8	49.78	49.73	27.9	7.54	58.24	28.1	11.26	6.01	28.1	19.30	54.35	28.2	2.31	5.12
28.8	49.98	49.59	28.9	7.65	58.02	29.1	11.10	5.73	29.1	18.32	54.12	29.2	2.00	5.09
29.8	50.19	49.44	29.9	7.77	57.78	30.1	10.92	5.43	30.1	17.28	53.88	30.2	1.66	5.07
30.8	50.41	49.29	30.9	7.91	57.54	31.1	10.75	5.11	31.1	16.21	53.61	31.2	1.31	5.02
31.8	50.65	49.14	31.9	8.05	57.29	32.1	10.60	4.77	32.1	15.16	53.33	32.2	0.94	4.96
	10.75	−10.71		8.55	−8.49		24.59	−24.57		74.67	−74.66		15.93	−15.90
	12ʰ 45ᵐ	55ˢ.22		14ʰ 13ᵐ	9ˢ.28		18ʰ 5ᵐ	0ˢ.43		19ʰ 24ᵐ	31ˢ.66		22ʰ 15ᵐ	43ˢ.98
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			δ Octantis. Mag. 4.1			χ Octantis. Mag. 5.2			σ Octantis. Mag. 5.5			υ Octantis. Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Dec.	12 45	−84 39	Dec.	14 13	−83 16	Dec.	18 5	−87 39	Dec.	19 25	−89 13	Dec.	22 15	−86 2
	s	″		s	″		s	″		s	″		s	″
0.8	50.41	49.29	0.9	7.91	57.54	1.1	10.75	65.11	1.1	16.21	53.61	1.2	61.31	65.0
1.8	50.65	49.14	1.9	8.05	57.29	2.1	10.60	64.77	2.1	15.16	53.33	2.2	60.94	64.9
2.8	50.91	49.00	2.9	8.21	57.04	3.1	10.48	64.41	3.1	14.18	53.00	3.2	60.56	64.8
3.8	51.18	48.89	3.9	8.39	56.81	4.1	10.40	64.03	4.1	13.30	52.66	4.2	60.19	64.7
4.8	51.46	48.80	4.9	8.58	56.59	5.0	10.37	63.66	5.1	12.56	52.30	5.2	59.83	64.5
5.8	51.73	48.75	5.9	8.77	56.41	6.0	10.39	63.29	6.1	11.97	51.97	6.2	59.50	64.4
6.8	51.99	48.72	6.9	8.96	56.26	7.0	10.44	62.95	7.1	11.50	51.63	7.2	59.20	64.2
7.8	52.23	48.71	7.9	9.14	56.13	8.0	10.50	62.63	8.1	11.10	51.32	8.2	58.92	64.0
8.8	52.47	48.69	8.9	9.31	56.00	9.0	10.55	62.34	9.1	10.71	51.03	9.2	58.66	63.9
9.8	52.69	48.66	9.9	9.46	55.88	10.0	10.58	62.06	10.1	10.27	50.76	10.2	58.41	63.8
10.8	52.90	48.62	10.9	9.61	55.74	11.0	10.57	61.78	11.1	9.74	50.48	11.2	58.14	63.6
11.8	53.12	48.56	11.9	9.75	55.59	12.0	10.54	61.49	12.1	9.13	50.21	12.2	57.85	63.5
12.8	53.35	48.49	12.9	9.91	55.41	13.0	10.51	61.18	13.1	8.45	49.93	13.2	57.55	63.4
13.8	53.59	48.42	13.9	10.07	55.22	14.0	10.46	60.85	14.1	7.73	49.62	14.2	57.22	63.3
14.8	53.85	48.35	14.9	10.25	55.03	15.0	10.44	60.49	15.1	7.04	49.28	15.2	56.88	63.2
15.8	54.13	48.29	15.9	10.45	54.85	16.0	10.45	60.11	16.1	6.41	48.92	16.2	56.53	63.0
16.8	54.41	48.25	16.9	10.65	54.67	17.0	10.50	59.72	17.1	5.87	48.56	17.2	56.19	62.8
17.8	54.70	48.23	17.9	10.86	54.52	18.0	10.58	59.34	18.1	5.44	48.19	18.2	55.86	62.6
18.8	54.99	48.24	18.9	11.07	54.39	19.0	10.70	58.97	19.1	5.12	47.81	19.2	55.55	62.4
19.8	55.27	48.26	19.9	11.28	54.28	20.0	10.84	58.62	20.1	4.89	47.44	20.2	55.26	62.2
20.8	55.53	48.30	20.8	11.48	54.19	21.0	11.00	58.29	21.1	4.73	47.10	21.2	55.00	61.9
21.8	55.79	48.35	21.8	11.68	54.11	22.0	11.16	57.96	22.1	4.62	46.75	22.2	54.75	61.7
22.8	56.04	48.40	22.8	11.88	54.04	23.0	11.32	57.65	23.1	4.53	46.44	23.2	54.51	61.5
23.8	56.28	48.45	23.8	12.07	53.97	23.9	11.48	57.36	24.1	4.45	46.13	24.2	54.28	61.3
24.8	56.51	48.48	24.8	12.25	53.90	24.9	11.62	57.07	25.1	4.33	45.82	25.2	54.04	61.1
25.8	56.74	48.51	25.8	12.42	53.83	25.9	11.75	56.78	26.0	4.16	45.51	26.2	53.80	60.9
26.8	56.98	48.54	26.8	12.60	53.74	26.9	11.87	56.48	27.0	3.95	45.20	27.2	53.55	60.7
27.8	57.22	48.55	27.8	12.79	53.64	27.9	11.98	56.16	28.0	3.69	44.87	28.2	53.28	60.5
28.8	57.49	48.57	28.8	12.99	53.53	28.9	12.11	55.81	29.0	3.44	44.52	29.2	52.99	60.3
29.8	57.77	48.60	29.8	13.20	53.43	29.9	12.26	55.45	30.0	3.23	44.15	30.2	52.70	60.1
30.8	58.06	48.64	30.8	13.42	53.33	30.9	12.45	55.07	31.0	3.12	43.76	31.2	52.41	59.8
31.8	58.35	48.72	31.8	13.66	53.26	31.9	12.68	54.70	32.0	3.15	43.37	32.1	52.13	59.54
	10.75	−10.70		8.55	−8.49		24.56	−24.54		74.45	−74.44		15.93	−15.00
	12h 45m	55s.22		14h 13m	9s.28		18h 5m	0s.43		19h 24m	31s.66		22h 15m	43s.98
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.31

EAN ERRORS OF NEWCOMB'S PLACES FOR 1920 OF STARS OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

t. o.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.	
					α	δ						α	δ
		h	m	°	s	″			h	m	°	s	″
1	33 Piscium	0	1	− 6	.018	.25	109	ε Sculpt.	1	42	−25	.037	.46
3	α Androm.		4	+29	.010	.13	116	ζ Ceti		48	−11	.020	.24
4	β Cassiop.		5	+59	.017	.17	118	α Trianguli		49	+29	.022	.22
5	ε Phœnicis		5	−46	.051	.41	117	ε Cassiop.		49	+63	.017	.17
6	22 Androm.		6	+46	.024	.28	120	ξ Piscium		49	+ 3	.018	.23
0	γ Pegasi	0	9	+15	.011	.14	121	β Arietis	1	50	+20	.013	.20
4	σ Androm.		14	+36	.029	.33	122	ψ Phœnicis		50	−47	.080	.81
5	ι Ceti		15	− 9	.014	.20	127	υ Ceti		56	−21	.025	.32
6	ζ Tucanæ		16	−65	.047	.38	129	α Hydri		56	−62	.049	.34
9	44 Piscium		21	+ 1	.018	.22	126	50 Cassiop.		57	+72	.016	.17
0	β Hydri	0	22	−78	....	...	131	γ Andr. *pr.*	1	59	+42	.016	.16
1	α Phœnicis		22	−43	.047	.31	133	α Arietis	2	3	+23	.010	.14
3	12 Ceti		26	− 4	.017	.21	134	β Trianguli		5	+35	.018	.21
30	13 Ceti		31	− 4	.023	.30	136	55 Cassiop.		8	+66	.025	.24
31	ζ Cassiop.		33	+53	.021	.20	137	6 Persei		8	+51	.025	.27
32	π Androm.	0	33	+33	.021	.21	138	ξ^1 Ceti	2	9	+ 8	.018	.23
35	ε Androm.		34	+29	.016	.19	139	μ Fornacis		9	−31	.076	.83
36	δ Androm.		35	+30	.018	.22	141	γ Trianguli		13	+33	.024	.31
37	α Cassiop.		36	+56	.012	.14	142	67 Ceti		13	− 7	.021	.25
38	μ Phœnicis		38	−47	....	.53	144	φ Eridani		14	−52	.049	.42
39	β Ceti	0	40	−18	.013	.17	145	ο Ceti	2	15	− 3	.018	.23
42	ο Cassiop.		40	+48	.034	.26	146	κ Fornacis		19	−24	.049	.47
41	21 Cassiop.		40	+75	.017	.24	148	δ Hydri		20	−69	....	...
45	ζ Androm.		43	+24	.019	.24	149	ι Cassiop.		22	+67	.025	.25
46	η Cassiop.		44	+57	.017	.24	153	ξ^2 Ceti		24	+ 8	.014	.19
49	δ Piscium	0	45	+ 7	.014	.20	156	σ Ceti	2	28	−16	.028	.37
52	λ Hydri		46	−75	....	.70	157	36 H. Cassiop.		30	+72	.021	.22
53	20 Ceti		49	− 2	.018	.26	160	ν Ceti		32	+ 5	.020	.26
54	γ Cassiop.		52	+60	.018	.22	163	μ Hydri		33	−79	.056	.70
55	μ Androm.		52	+38	.017	.21	161	ν Arietis		34	+22	.020	.26
58	α Sculptoris	0	55	−30	.025	.23	165	δ Ceti	2	35	− 0	.014	.20
59	43 H. Cephei		58	+86	.010	.17	172	ε Hydri		38	−69	....	...
61	ε Piscium	0	59	+ 7	.012	.26	170	θ Persei		39	+49	.021	.19
66	β Phœnicis	1	3	−47	.050	.47	173	γ Ceti *seq.*		39	+ 3	.016	.20
65	μ Cassiop.		3	+55	.022	.27	174	π Ceti		40	−14	.025	.25
69	η Ceti	1	5	−11	.025	.22	175	μ Ceti	2	41	+10	.020	.21
71	β Androm.		5	+35	.013	.17	177	η Persei		45	+56	.010	.25
74	τ Piscium		7	+30	.019	.33	178	41 Arietis		45	+27	.020	.22
76	ζ Piscium		10	+ 7	.019	.24	179	β Fornacis		46	−33	.050	.47
78	κ Tucanæ		13	−69	....	...	180	σ Arietis		47	+15	.018	.24
79	f Piscium	1	14	+ 3	.022	.29	181	τ^2 Eridani	2	47	−21	.022	.32
80	υ Piscium		15	+27	.022	.25	182	τ Persei		49	+52	.020	.19
85	θ Ceti		20	− 9	.013	.19	183	η Eridani		53	− 9	.016	.21
86	δ Cassiop.		21	+60	.018	.19	185	ε Arietis		55	+21	.016	.23
91	γ Phœnicis		25	−44	.044	.35	187	θ Eridani		55	−41	.056	.42
90	38 Cassiop.	1	25	+70	.026	.28	184	47 H. Cephei	2	55	+79	.035	.32
94	η Piscium		27	+15	.020	.19	189	α Ceti		58	+ 4	.010	.13
89	α Urs. Min.		32	+89	....	...	191	τ^3 Eridani		59	−24	.029	.32
96	40 Cassiop.		32	+73	.028	.25	190	γ Persei	2	59	+53	.029	.20
97	υ Androm.		32	+41	.024	.26	192	ρ Persei	3	0	+39	.019	.24
98	π Piscium	1	33	+12	.022	.25	194	μ Horologii	3	2	−60	.060	.49
99	υ Persei		33	+48	.018	.19	197	θ Hydri		2	−72	.046	.47
101	α Eridani		35	−58	....	...	195	β Persei		3	+41	.016	.20
103	ω Cassiop.		36	+68	.025	.25	199	δ Arietis		7	+19	.014	.17
104	ν Piscium		37	+ 5	.014	.20	202	12 Eridani		9	−29	.022	.30
105	φ Persei	1	39	+50	.022	.20	200	48 H. Cephei	3	10	+77	.032	.32
107	τ Ceti		40	−16	.020	.25	203	ζ Arietis		10	+21	.018	.20
108	ο Piscium		41	+ 9	.013	.19	204	38 Horologii(G.)		11	−58	...	
112	4 Octantis(G.)	1	42	−85	.039	.40	206	ζ Eridani	3	12	− 9	.0	

MEAN ERRORS OF NEWCOMB'S PLACES FOR 1920 OF STARS OF THE AMERICA EPHEMERIS AND NAUTICAL ALMANAC.

Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.	
					a	δ
		h	m	°	s	"
209	τ Arietis	3	17	+21	.027	.32
210	*e* Eridani		17	−43	.056	.49
212	ι Hydri		18	−78	....	...
211	α Persei		19	+50	.013	.14
213	ο Tauri		21	+ 9	.014	.21
214	2 H. Camel.	3	23	+60	.028	.37
215	ξ Tauri		23	+ 9	.023	.22
219	*f* Tauri		26	+13	.016	.22
221	ε Eridani		29	−10	.014	.17
222	τ^5 Eridani		30	−22	.031	.40
230	δ Persei	3	37	+48	.016	.16
235	δ Eridani		39	−10	.020	.24
234	ν Persei		40	+42	.024	.25
237	5 H. Camel.		42	+71	.025	.29
238	η Tauri		43	+24	.014	.17
239	τ^6 Eridani	3	43	−23	.023	.30
243	*g* Eridani		46	−36	.073	.63
246	γ Hydri		48	−74	.031	.29
244	ζ Persei		49	+32	.019	.22
245	9 H. Camel.		50	+61	.031	.33
248	ε Persei	3	52	+40	.019	.22
250	ξ Persei		54	+36	.019	.22
251	γ Eridani		54	−14	.017	.19
252	λ Tauri		56	+12	.018	.22
254	δ Reticuli		57	−62	.044	.36
255	ν Tauri	3	59	+ 6	.018	.22
256	*A* Tauri	4	0	+22	.020	.23
260	*c* Persei		3	+47	.020	.22
263	*p* Tauri		6	+26	.030	.37
265	υ^1 Eridani		8	− 7	.016	.23
264	Gr. 750	4	11	+85	.017	.24
268	μ Tauri		11	+ 9	.027	.47
270	α Horologii		11	−42	.073	.69
271	α Reticuli		13	−63	.061	.54
274	γ Tauri		15	+15	.013	.21
277	δ Tauri	4	18	+17	.017	.23
279	υ^5 Eridani		21	−34	.046	.42
284	δ Mensæ		23	−80	.058	.52
281	ε Tauri		24	+19	.013	.20
285	*m* Persei		28	+43	.031	.34
288	α Tauri	4	31	+16	.009	.13
291	α Doradus		32	−55	.054	.40
289	ν Eridani		32	− 4	.018	.24
292	53 Eridani		35	−14	.023	.28
296	τ Tauri		37	+23	.014	.23
297	α Cœli	4	38	−42	.050	.46
294	Gr. 848		38	+76	.024	.30
298	4 Camelop.		41	+57	.027	.25
299	μ Eridani		42	− 3	.016	.21
303	π^3 Orionis		45	+ 7	.021	.22
302	9 Camelop.	4	46	+66	.021	.19
304	*i* Tauri		47	+19	.023	.31
307	π^5 Orionis		50	+ 2	.016	.22
309	ι Aurigæ		52	+33	.014	.17
313	ε Aurigæ		56	+44	.021	.19
312	β Camelop.	4	56	+60	.023	.19
314	ζ Aurigæ		57	+41	.017	.22
316	ι Tauri	4	58	+21	.019	.26
318	11 Orionis	5	0	+15	.020	.35

Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Err 1920.
					a
		h	m	°	s
319	η Aurigæ	5	1	+41	.021
320	ε Leporis		2	−22	.021
322	β Eridani		4	− 5	.016
327	μ Aurigæ		8	+38	.028
328	μ Leporis		9	−16	.032
326	19 H.Camel.	5	9	+79	.025
330	β Orionis		11	− 8	.009
329	α Aurigæ		11	+46	.012
332	λ Aurigæ		14	+40	.027
333	τ Orionis		14	− 7	.014
335	ο Columbæ	5	15	−35	.068
342	γ Orionis		21	+ 6	.017
343	β Tauri		21	+29	.010
344	17 Camelop.		23	+63	.029
347	β Leporis		25	−21	.025
348	χ Aurigæ	5	28	+32	.022
350	δ Orionis		28	− 0	.012
349	Gr. 966		29	+75	.022
354	α Leporis		29	−18	.018
355	ϕ^1 Orionis		30	+ 9	.021
359	ι Orionis	5	32	− 6	.022
361	ε Orionis		32	− 1	.013
362	ζ Tauri		33	+21	.019
356	Gr. 944		36	+85	.030
366	ζ Orionis		37	− 2	.016
368	α Columbæ	5	37	−34	.024
369	ο Aurigæ		40	+50	.028
372	ζ Leporis		43	−15	.023
373	κ Orionis		44	−10	.013
375	δ Doradus		45	−66	....
381	31 Mensæ (G.)	5	46	−85	.042
374	ν Aurigæ		46	+39	.021
378	δ Leporis		48	−21	.036
382	α Orionis		51	+ 7	.008
385	η Leporis		53	−14	.022
383	δ Aurigæ	5	53	+54	.026
387	β Aurigæ		54	+45	.016
388	θ Aurigæ		54	+37	.020
393	1 Gemin.	5	59	+23	.021
395	1 Puppis (G.)	6	2	−45	.057
396	ν Orionis	6	3	+15	.016
402	22 H.Camel.		10	+69	.022
405	η Gemin.		10	+23	.014
406	2 Lyncis		13	+59	.023
411	ζ Can. Maj.		17	−30	.055
412	μ Gemin.	6	18	+23	.013
413	ψ^1 Aurigæ		19	+49	.025
414	β Can. Maj.		19	−18	.019
415	8 Monoc.		20	+ 5	.022
416	α Argûs		22	−53	....
418	10 Monoc.	6	24	− 5	.017
419	ν Gemin.		24	+20	.027
423	8 Lyncis		30	+62	.022
425	ξ^2 Can. Maj.		32	−23	.034
424	23 H.Camel.		33	+80	.024
427	γ Gemin.	6	33	+16	.013
426	51 Aurigæ		33	+39	.025
429	ν Argûs		35	−43	.058
430	S Monoc.	6	37	+10	.016

AN ERRORS OF NEWCOMB'S PLACES FOR 1920 OF STARS OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.	
					α	δ
		h	m	°	s	″
	ε Gemin.	6	39	+25	.014	.19
	ξ Gemin.		41	+13	.013	.21
2	ψ^5 Aurigæ		41	+44	.029	.24
4	α Can. Maj.		42	−17	....	.16
5	18 Monoc.		44	+ 3	.020	.25
6	43 Camelop.	6	45	+69	.027	.24
3	ζ Mensæ		47	−81	.048	.47
1	α Pictoris		47	−62	.061	.63
0	θ Gemin.		48	+34	.020	.22
2	τ Argûs		48	−51	.069	.64
4	15 Lyncis	6	50	+59	.023	.21
6	θ Can. Maj.		50	−12	.021	.31
1	ε Can. Maj.		55	−29	.017	.23
4	ζ Gemin.	6	59	+21	.016	.19
5	o^2 Can. Maj.	7	0	−24	.025	.29
6	γ Can. Maj.	7	0	−16	.021	.28
49	51 H. Cephei		4	+87	....	...
50	δ Can. Maj.		5	−26	.020	.24
51	63 Aurigæ		6	+39	.021	.26
54	51 Gemin.		9	+16	.023	.37
65	γ^2 Volantis	7	9	−70	.071	.64
69	λ Gemin.		13	+17	.013	.22
70	π Argûs		14	−37	.046	.34
67	25 H. Camel.		14	+83	.025	.24
80	7 Octant. (G.)		15	−87	.053	.46
71	δ Gemin.	7	15	+22	.014	.17
74	δ Volantis		17	−68	.061	.64
76	ι Gemin.		21	+28	.014	.22
77	η Can. Maj.		21	−29	.021	.25
78	Gr. 1308		23	+69	.028	.26
79	β Can. Min.	7	23	+ 8	.014	.19
81	ρ Gemin.		24	+32	.021	.27
83	σ Argûs		27	−43	.060	.46
84	α^2 Gemin		29	+32	.019	.14
88	25 Monoc.		33	− 4	.040	.42
92	α Can. Min.	7	35	+ 5	....	.15
93	24 Lyncis		36	+59	.033	.29
95	κ Gemin.		40	+25	.018	.22
96	β Gemin.		40	+28	.010	.12
99	4 Puppis		42	−14	.028	.36
502	ξ Argûs	7	46	−25	.021	.27
505	φ Gemin.		49	+27	.018	.28
506	26 Lyncis		49	+48	.022	.30
507	Gr. 1374		51	+74	.029	.32
514	χ Argûs		55	−53	.052	.40
515	ω Cancri	7	56	+26	.022	.30
517	χ Gemin.	7	59	+28	.018	.24
520	27 Lyncis	8	2	+52	.022	.23
523	ρ Argûs		4	−24	.018	.24
522	3 H. Ur. Maj.		5	+69	.025	.29
525	γ Argûs	8	7	−47	.051	.44
526	ζ Cancri		8	+18	.022	.25
527	Br. 1147		10	+76	.026	.31
528	20 Puppis		10	−16	.023	.32
529	β Cancri		12	+ 9	.013	.24
533	31 Lyncis	8	17	+43	.027	.22
518	Gr. 1119		19	+89	.025	...
534	d^1 Cancri		19	+19	.022	.29
535	ε Argûs	8	21	−59	.038	.33
536	30 Monoc.	8	22	− 4	.017	.23
539	θ Chamæl.		23	−77	.050	.40
537	ο Urs. Maj.		24	+61	.014	.15
543	Gr. 1450		28	+38	.047	.43
544	η Cancri		28	+21	.019	.20
545	Gr. 1446	8	31	+74	.032	.38
547	δ Hydræ		33	+ 6	.019	.26
548	σ Hydræ		35	+ 4	.023	.27
554	γ Cancri		39	+22	.016	.21
556	δ Cancri		40	+18	.017	.21
557	α Pyxidis	8	40	−33	.053	.42
558	ι Cancri		42	+29	.025	.26
560	δ Argûs		42	−54	.053	.41
559	ε Hydræ		43	+ 7	.014	.19
566	σ^2 Cancri		49	+31	.022	.31
567	ζ Hydræ	8	51	+ 6	.018	.24
569	ι Urs. Maj.		54	+48	.016	.17
571	α Cancri		54	+12	.015	.20
574	b^1 Carinæ		55	−59	.044	.43
576	κ Urs. Maj.	8	58	+47	.018	.19
582	σ^2 Urs. Maj.	9	3	+67	.020	.28
583	κ Cancri		3	+11	.016	.22
585	λ Argûs		5	−43	.039	.32
590	ζ Octantis		9	−85	.041	.38
589	θ Hydræ		10	+ 3	.014	.19
591	β Argûs	9	12	−69	.035	.28
593	83 Cancri		15	+18	.018	.24
594	ι Argûs		15	−59	....	...
595	40 Lyncis		16	+35	.018	.21
596	θ Pyxidis		18	−26	.046	.61
599	α Hydræ	9	24	− 8	.010	.15
601	h Urs. Maj.		25	+63	.019	.19
600	1 H. Draco.		26	+82	.016	.20
603	d Urs. Maj.		27	+70	.025	.24
604	θ Urs. Maj.		28	+52	.017	.17
606	ψ Argûs	9	28	−40	.056	.51
605	ξ Leonis		28	+12	.024	.30
607	10 Leo. Min.		29	+37	.020	.27
620	ζ Chamæl.		36	−81	.047	.48
619	ο Leonis		37	+10	.014	.16
622	θ Antliæ	9	41	−27	.057	.49
623	ε Leonis		41	+24	.014	.17
627	υ Argûs		45	−65	.049	.38
626	υ Urs. Maj.		45	+59	.013	.17
629	6 Sextantis		47	− 4	.030	.35
630	μ Leonis	9	48	+26	.014	.19
632	Gr. 1586		51	+73	.026	.32
634	19 Leo. Min.		53	+41	.022	.24
636	φ Argûs		54	−54	.045	.37
638	π Leonis	9	56	+ 8	.012	.20
641	η Leonis	10	3	+17	.022	.22
642	α Leonis		4	+12	.015	.13
644	λ Hydræ		7	−12	.019	.24
645	q Velorum		11	−42	.088	.76
646	32 Urs. Maj.		12	+66	.024	.25
648	ζ Leonis	10	12	+24	.018	.22
647	λ Urs. Maj.		12	+43	.017	.16
653	γ Leonis *pr.*		16	+20	.019	.15
657	μ Urs. Maj.	10	18	+42	.016	.19

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	**Right Ascension.**	**Declination *South.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *South.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *South.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *South.***	**Mean Solar Date.**	**Right Ascension.**	**Decl natio Sout**
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Apr.	12 46	−84 39	Apr.	14 13	−83 16	Apr.	18 5	−87 39	Apr.	19 25	−89 13	Apr.	22 15	−86 2
	s	″		s	″		s	″		s	″		s	″
0.5	5.69	53.86	0.6	19.46	53.10	0.7	21.66	42.21	0.8	11.70	29.15	0.9	41.16	48.0
1.5	5.75	54.22	1.6	19.58	53.41	1.7	22.29	42.20	1.8	13.46	29.01	1.9	41.35	47.6
2.5	5.81	54.61	2.6	19.70	53.74	2.7	22.95	42.19	2.8	15.33	28.87	2.9	41.55	47.2
3.5	5.86	55.02	3.6	19.83	54.09	3.7	23.65	42.20	3.8	17.32	28.75	3.9	41.78	46.9
4.5	5.90	55.44	4.6	19.96	54.47	4.7	24.37	42.23	4.8	19.41	28.63	4.9	42.03	46.5
5.5	5.92	55.88	5.6	20.07	54.86	5.7	25.10	42.29	5.8	21.55	28.54	5.9	42.31	46.1
6.5	5.92	56.31	6.6	20.16	55.26	6.7	25.80	42.38	6.8	23.68	28.49	6.9	42.62	45.8
7.5	5.91	56.73	7.6	20.24	55.66	7.7	26.46	42.50	7.8	25.75	28.45	7.9	42.94	45.5
8.5	5.88	57.12	8.5	20.30	56.05	8.7	27.10	42.62	8.8	27.72	28.43	8.9	43.25	45.2
9.5	5.84	57.50	9.5	20.36	56.42	9.7	27.69	42.74	9.8	29.60	28.42	9.9	43.54	45.0
10.5	5.81	57.85	10.5	20.41	56.76	10.7	28.26	42.85	10.8	31.38	28.41	10.9	43.82	44.7
11.5	5.78	58.19	11.5	20.47	57.09	11.7	28.80	42.95	11.8	33.07	28.39	11.9	44.08	44.5
12.5	5.77	58.53	12.5	20.53	57.41	12.7	29.35	43.03	12.8	34.75	28.35	12.9	44.33	44.2
13.5	5.77	58.87	13.5	20.60	57.72	13.7	29.91	43.09	13.8	36.43	28.31	13.9	44.57	43.9
14.5	5.78	59.21	14.5	20.68	58.04	14.7	30.48	43.16	14.7	38.17	28.25	14.9	44.80	43.6
15.5	5.79	59.56	15.5	20.77	58.37	15.7	31.08	43.23	15.7	39.96	28.18	15.9	45.05	43.4
16.5	5.79	59.93	16.5	20.86	58.71	16.7	31.69	43.30	16.7	41.81	28.12	16.9	45.31	43.1
17.5	5.79	60.31	17.5	20.94	59.07	17.7	32.32	43.38	17.7	43.73	28.07	17.9	45.59	42.8
18.5	5.77	60.70	18.5	21.02	59.44	18.7	32.97	43.48	18.7	45.73	28.03	18.9	45.89	42.5
19.5	5.75	61.10	19.5	21.08	59.82	19.7	33.61	43.61	19.7	47.76	28.02	19.9	46.21	42.2
20.5	5.70	61.50	20.5	21.14	60.21	20.7	34.24	43.76	20.7	49.80	28.03	20.9	46.54	41.9
21.5	5.64	61.90	21.5	21.18	60.61	21.7	34.86	43.92	21.7	51.83	28.07	21.8	46.89	41.6
22.4	5.57	62.28	22.5	21.21	61.00	22.7	35.46	44.10	22.7	53.80	28.11	22.8	47.24	41.4
23.4	5.49	62.65	23.5	21.24	61.38	23.7	36.02	44.28	23.7	55.68	28.17	23.8	47.58	41.2
24.4	5.41	62.99	24.5	21.25	61.74	24.7	36.55	44.46	24.7	57.48	28.23	24.8	47.92	41.0
25.4	5.34	63.31	25.5	21.27	62.09	25.7	37.06	44.63	25.7	59.18	28.29	25.8	48.24	40.8
26.4	5.27	63.62	26.5	21.30	62.41	26.7	37.56	44.77	26.7	60.83	28.32	26.8	48.53	40.6
27.4	5.22	63.93	27.5	21.33	62.72	27.7	38.06	44.90	27.7	62.46	28.33	27.8	48.80	40.4
28.4	5.19	64.26	28.5	21.37	63.04	28.7	38.59	45.02	28.7	64.14	28.33	28.8	49.07	40.1
29.4	5.16	64.60	29.5	21.43	63.38	29.7	39.15	45.13	29.7	65.91	28.31	29.8	49.36	39.9
30.4	5.12	64.95	30.5	21.48	63.73	30.6	39.74	45.25	30.7	67.77	28.31	30.8	49.66	39.6
31.4	5.08	65.33	31.5	21.53	64.10	31.6	40.35	45.39	31.7	69.74	28.32	31.8	49.99	39.3
	10.76	−10.71		8.55	−8.49		24.51	−24.49		73.88	−73.88		15.91	−15.87
	12h 45m	55s.22		14h 13m	9s.28		18h 5m	0s.43		19h 24m	31s.66		22h 15m	43s.9
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
an lar te.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
y	12 46	−84 40	May	14 13	−83 17	May	18 5	−87 39	May	19 26	−89 13	May	22 15	−86 23
	s	″		s	″		s	″		s	″		s	″
.4	5.12	4.95	0.5	21.48	3.73	0.6	39.74	45.25	0.7	7.77	28.31	0.8	49.66	39.64
.4	5.08	5.33	1.5	21.53	4.10	1.6	40.35	45.39	1.7	9.74	28.32	1.8	49.99	39.38
.4	5.02	5.72	2.5	21.57	4.49	2.6	40.97	45.55	2.7	11.77	28.35	2.8	50.34	39.12
.4	4.94	6.11	3.5	21.59	4.89	3.6	41.58	45.74	3.7	13.81	28.41	3.8	50.72	38.88
.4	4.84	6.48	4.5	21.60	5.30	4.6	42.16	45.97	4.7	15.83	28.51	4.8	51.12	38.68
.4	4.72	6.84	5.5	21.59	5.70	5.6	42.70	46.21	5.7	17.74	28.62	5.8	51.52	38.51
.4	4.60	7.17	6.5	21.58	6.07	6.6	43.19	46.45	6.7	19.52	28.74	6.8	51.90	38.35
.4	4.48	7.47	7.5	21.56	6.42	7.6	43.64	46.68	7.7	21.18	28.87	7.8	52.25	38.21
8.4	4.37	7.75	8.5	21.53	6.75	8.6	44.07	46.90	8.7	22.74	28.99	8.8	52.59	38.07
9.4	4.26	8.03	9.5	21.51	7.05	9.6	44.49	47.09	9.7	24.25	29.08	9.8	52.91	37.94
0.4	4.17	8.30	10.5	21.51	7.34	10.6	44.91	47.27	10.7	25.75	29.17	10.8	53.22	37.79
1.4	4.07	8.57	11.5	21.51	7.64	11.6	45.35	47.45	11.7	27.26	29.24	11.8	53.52	37.64
2.4	3.99	8.86	12.5	21.51	7.94	12.6	45.80	47.62	12.7	28.82	29.31	12.8	53.83	37.47
3.4	3.91	9.15	13.5	21.52	8.26	13.6	46.27	47.78	13.7	30.45	29.37	13.8	54.14	37.29
4.4	3.82	9.46	14.4	21.53	8.59	14.6	46.75	47.96	14.7	32.13	29.45	14.8	54.47	37.11
5.4	3.73	9.77	15.4	21.53	8.93	15.6	47.25	48.17	15.7	33.87	29.54	15.8	54.83	36.94
6.4	3.62	10.10	16.4	21.52	9.28	16.6	47.75	48.39	16.7	35.64	29.65	16.8	55.20	36.77
7.4	3.50	10.42	17.4	21.50	9.64	17.6	48.24	48.63	17.7	37.42	29.78	17.8	55.58	36.62
8.4	3.36	10.73	18.4	21.48	10.01	18.6	48.72	48.89	18.7	39.20	29.93	18.8	55.98	36.49
9.4	3.22	11.04	19.4	21.44	10.37	19.6	49.17	49.16	19.7	40.92	30.09	19.8	56.39	36.37
0.4	3.06	11.32	20.4	21.38	10.72	20.6	49.58	49.45	20.7	42.56	30.27	20.8	56.79	36.28
1.4	2.90	11.58	21.4	21.33	11.05	21.6	49.96	49.73	21.6	44.09	30.46	21.8	57.18	36.21
2.4	2.74	11.83	22.4	21.27	11.36	22.6	50.32	50.00	22.6	45.52	30.65	22.8	57.54	36.14
3.4	2.59	12.06	23.4	21.21	11.65	23.6	50.65	50.25	23.6	46.87	30.81	23.8	57.89	36.08
4.4	2.45	12.28	24.4	21.16	11.93	24.6	50.97	50.48	24.6	48.19	30.97	24.8	58.21	36.01
5.4	2.33	12.51	25.4	21.13	12.20	25.6	51.31	50.69	25.6	49.51	31.09	25.8	58.52	35.92
6.4	2.22	12.75	26.4	21.10	12.48	26.6	51.68	50.89	26.6	50.91	31.21	26.8	58.83	35.80
7.4	2.11	13.00	27.4	21.08	12.77	27.6	52.08	51.10	27.6	52.38	31.32	27.7	59.16	35.68
28.4	2.00	13.27	28.4	21.06	13.08	28.6	52.50	51.32	28.6	53.95	31.45	28.7	59.51	35.55
29.3	1.87	13.55	29.4	21.04	13.41	29.6	52.94	51.57	29.6	55.60	31.59	29.7	59.89	35.43
30.3	1.73	13.84	30.4	20.99	13.76	30.6	53.38	51.84	30.6	57.28	31.76	30.7	60.29	35.32
31.3	1.56	14.13	31.4	20.93	14.11	31.6	53.79	52.14	31.6	58.94	31.96	31.7	60.71	35.24
	10.76	−10.72		8.55	−8.49		24.53	−24.51		73.92	−73.91		15.90	−15.87
	12^h 45^m	$55^s.22$		14^h 13^m	$9^s.28$		18^h 5^m	$0^s.43$		19^h 24^m	$31^s.66$		22^h 15^m	$43^s.98$
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
June	12 45	−84 40	June	14 13	−83 17	June	18 5	−87 39	June	19 26	−89 13	June	22 16	−86
	s	″		s	″		s	″		s	″		s	″
0.3	61.56	14.13	0.4	20.93	14.11	0.6	53.79	52.14	0.6	58.94	31.96	0.7	0.71	35.
1.3	61.37	14.40	1.4	20.86	14.45	1.6	54.16	52.46	1.6	60.50	32.18	1.7	1.13	35.
2.3	61.17	14.63	2.4	20.77	14.77	2.6	54.47	52.78	2.6	61.92	32.43	2.7	1.53	35.
3.3	60.98	14.84	3.4	20.67	15.07	3.6	54.75	53.09	3.6	63.22	32.66	3.7	1.92	35.
4.3	60.80	15.03	4.4	20.58	15.34	4.6	55.00	53.39	4.6	64.42	32.90	4.7	2.28	35.
5.3	60.62	15.19	5.4	20.49	15.58	5.6	55.23	53.67	5.6	65.52	33.11	5.7	2.62	35.
6.3	60.45	15.35	6.4	20.40	15.82	6.5	55.44	53.93	6.6	66.57	33.33	6.7	2.94	35.
7.3	60.29	15.52	7.4	20.32	16.05	7.5	55.67	54.18	7.6	67.62	33.51	7.7	3.25	35.
8.3	60.15	15.68	8.4	20.25	16.28	8.5	55.91	54.42	8.6	68.70	33.69	8.7	3.57	35.
9.3	60.01	15.85	9.4	20.19	16.52	9.5	56.17	54.66	9.6	69.83	33.88	9.7	3.89	35.
10.3	59.86	16.03	10.4	20.13	16.76	10.5	56.44	54.90	10.6	71.00	34.06	10.7	4.22	35.
11.3	59.71	16.23	11.4	20.06	17.02	11.5	56.72	55.16	11.6	72.23	34.25	11.7	4.57	35.
12.3	59.54	16.43	12.4	19.99	17.29	12.5	57.00	55.45	12.6	73.51	34.46	12.7	4.93	35.
13.3	59.36	16.63	13.4	19.90	17.57	13.5	57.27	55.75	13.6	74.79	34.69	13.7	5.30	35.
14.3	59.17	16.82	14.4	19.80	17.85	14.5	57.54	56.06	14.6	76.07	34.93	14.7	5.69	35.
15.3	58.97	17.01	15.4	19.70	18.13	15.5	57.78	56.39	15.6	77.29	35.20	15.7	6.08	35.
16.3	58.75	17.17	16.4	19.58	18.40	16.5	57.98	56.72	16.6	78.43	35.48	16.7	6.48	35.
17.3	58.53	17.32	17.4	19.46	18.65	17.5	58.15	57.06	17.6	79.46	35.76	17.7	6.86	35.
18.3	58.31	17.44	18.4	19.33	18.88	18.5	58.28	57.39	18.6	80.38	36.05	18.7	7.22	35.
19.3	58.10	17.54	19.4	19.20	19.09	19.5	58.38	57.70	19.6	81.18	36.33	19.7	7.55	35.
20.3	57.91	17.63	20.3	19.08	19.27	20.5	58.47	57.98	20.6	81.93	36.58	20.7	7.86	35.4
21.3	57.73	17.72	21.3	18.97	19.44	21.5	58.57	58.25	21.6	82.67	36.81	21.7	8.15	35.4
22.3	57.57	17.82	22.3	18.88	19.61	22.5	58.69	58.50	22.6	83.44	37.02	22.7	8.43	35.5
23.3	57.41	17.92	23.3	18.79	19.79	23.5	58.84	58.75	23.6	84.28	37.22	23.7	8.72	35.5
24.3	57.25	18.05	24.3	18.71	20.00	24.5	59.02	59.00	24.6	85.23	37.43	24.7	9.03	35.5
25.3	57.08	18.19	25.3	18.61	20.22	25.5	59.22	59.28	25.6	86.26	37.65	25.7	9.36	35.6
26.3	56.90	18.34	26.3	18.51	20.44	26.5	59.41	59.58	26.6	87.34	37.91	26.7	9.72	35.6
27.3	56.69	18.49	27.3	18.40	20.71	27.5	59.59	59.91	27.5	88.41	38.18	27.7	10.10	35.6
28.3	56.47	18.63	28.3	18.27	20.95	28.5	59.74	60.26	28.5	89.38	38.48	28.7	10.48	35.7
29.3	56.23	18.74	29.3	18.13	21.17	29.5	59.84	60.61	29.5	90.22	38.79	29.7	10.85	35.8
30.3	56.00	18.82	30.3	17.98	21.37	30.5	59.89	60.96	30.5	90.94	39.11	30.7	11.21	36.0
31.3	55.77	18.87	31.3	17.82	21.54	31.5	59.90	61.30	31.5	91.52	39.43	31.7	11.53	36.
	10.77	−10.72		8.56	−8.50		24.55	−24.53		74.07	−74.06		15.90	−15.
	$12^h\ 45^m$	$55^s.22$		$14^h\ 13^m$	$9^s.28$		$18^h\ 5^m$	$0^s.43$		$19^h\ 24^m$	$31^s.66$		$22^h\ 15^m$	$43^s.$
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
an lar te.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
ly	12 45	−84 40	July	14 13	−83 17	July	18 5	−87 40	July	19 27	−89 13	July	22 16	−86 23
	s	″		s	″		s	″		s	″		s	″
.3	56.00	18.82	0.3	17.98	21.37	0.5	59.89	0.96	0.5	30.94	39.11	0.7	11.21	36.03
.3	55.77	18.87	1.3	17.82	21.54	1.5	59.90	1.30	1.5	31.52	39.43	1.7	11.53	36.18
.3	55.55	18.90	2.3	17.67	21.68	2.5	59.88	1.61	2.5	32.00	39.75	2.7	11.83	36.33
.3	55.35	18.92	3.3	17.53	21.81	3.5	59.86	1.90	3.5	32.43	40.02	3.6	12.11	36.48
.2	55.15	18.94	4.3	17.40	21.92	4.5	59.83	2.17	4.5	32.81	40.30	4.6	12.37	36.62
.2	54.97	18.95	5.3	17.28	22.03	5.5	59.81	2.43	5.5	33.22	40.54	5.6	12.62	36.75
.2	54.80	18.97	6.3	17.16	22.14	6.5	59.81	2.69	6.5	33.65	40.79	6.6	12.88	36.86
.2	54.62	19.01	7.3	17.04	22.27	7.5	59.82	2.95	7.5	34.14	41.04	7.6	13.14	36.97
.2	54.43	19.05	8.3	16.92	22.40	8.5	59.84	3.22	8.5	34.66	41.29	8.6	13.42	37.08
.2	54.24	19.10	9.3	16.79	22.54	9.5	59.88	3.51	9.5	35.22	41.56	9.6	13.71	37.20
.2	54.04	19.15	10.3	16.65	22.70	10.5	59.90	3.81	10.5	35.81	41.84	10.6	14.02	37.32
.2	53.82	19.20	11.3	16.51	22.85	11.5	59.91	4.12	11.5	36.38	42.14	11.6	14.33	37.46
2.2	53.60	19.24	12.3	16.36	23.01	12.4	59.91	4.45	12.5	36.93	42.45	12.6	14.65	37.62
3.2	53.38	19.26	13.3	16.20	23.15	13.4	59.88	4.79	13.5	37.39	42.78	13.6	14.96	37.79
4.2	53.14	19.26	14.3	16.03	23.28	14.4	59.80	5.12	14.5	37.74	43.12	14.6	15.27	37.99
5.2	52.89	19.24	15.3	15.86	23.38	15.4	59.69	5.45	15.5	37.98	43.45	15.6	15.55	38.20
6.2	52.66	19.20	16.3	15.68	23.46	16.4	59.55	5.76	16.5	38.10	43.78	16.6	15.81	38.43
7.2	52.45	19.14	17.3	15.52	23.52	17.4	59.39	6.05	17.5	38.13	44.08	17.6	16.05	38.65
8.2	52.26	19.07	18.3	15.36	23.56	18.4	59.23	6.32	18.5	38.10	44.38	18.6	16.26	38.86
9.2	52.08	19.00	19.3	15.22	23.59	19.4	59.08	6.57	19.5	38.09	44.64	19.6	16.45	39.05
0.2	51.91	18.94	20.3	15.09	23.63	20.4	58.95	6.80	20.5	38.15	44.90	20.6	16.65	39.22
1.2	51.74	18.91	21.3	14.96	23.68	21.4	58.86	7.03	21.5	38.29	45.14	21.6	16.86	39.37
2.2	51.57	18.89	22.3	14.84	23.75	22.4	58.80	7.27	22.5	38.52	45.40	22.6	17.08	39.51
3.2	51.40	18.89	23.3	14.71	23.85	23.4	58.74	7.54	23.5	38.82	45.66	23.6	17.33	39.67
4.2	51.20	18.88	24.3	14.57	23.95	24.4	58.67	7.83	24.5	39.13	45.95	24.6	17.60	39.84
5.2	50.98	18.86	25.3	14.41	24.05	25.4	58.58	8.14	25.5	39.39	46.28	25.6	17.88	40.04
6.2	50.75	18.83	26.2	14.23	24.14	26.4	58.44	8.46	26.5	39.53	46.61	26.6	18.15	40.27
7.2	50.52	18.76	27.2	14.06	24.20	27.4	58.26	8.78	27.5	39.54	46.96	27.6	18.40	40.52
8.2	50.29	18.67	28.2	13.87	24.24	28.4	58.03	9.09	28.5	39.42	47.29	28.6	18.63	40.79
29.2	50.07	18.56	29.2	13.69	24.24	29.4	57.77	9.38	29.5	39.16	47.62	29.6	18.83	41.06
30.2	49.86	18.43	30.2	13.52	24.22	30.4	57.49	9.64	30.5	38.83	47.93	30.6	18.99	41.33
31.2	49.67	18.29	31.2	13.35	24.19	31.4	57.21	9.88	31.5	38.43	48.22	31.6	19.14	41.59
	10.77	−10.72		8.56	−8.50		24.58	−24.56		74.29	−74.28		15.90	−15.87
	$12^h\ 45^m$	$55^s.22$		$14^h\ 13^m$	$9^s.28$		$18^h\ 5^m$	$0^s.43$		$19^h\ 24^m$	$31^s.66$		$22^h\ 15^m$	$43^s.98$
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	**Right Ascension.**	**Declination *South.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *South.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *South.***	**Mean Solar Date.**	**Right Ascension.**	**Declination *South.***	**Mean Solar Date.**	**Right Ascension.**	**Decli- nation South.**
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Aug.	12 45	-84 40	Aug.	14 13	-83 17	Aug.	18 5	-87 40	Aug.	19 27	-89 13	Aug.	22 16	-86 2
	s	″		s	″		s	″		s	″		s	″
0.2	49.67	18.29	0.2	13.35	24.19	0.4	57.21	9.88	0.5	38.43	48.22	0.6	19.14	41.5
1.2	49.50	18.15	1.2	13.20	24.16	1.4	56.94	10.10	1.5	38.05	48.48	1.6	19.28	41.8
2.2	49.33	18.02	2.2	13.05	24.12	2.4	56.68	10.32	2.4	37.68	48.74	2.6	19.42	42.0
3.2	49.17	17.90	3.2	12.91	24.09	3.4	56.44	10.53	3.4	37.37	48.99	3.6	19.55	42.2
4.2	49.01	17.78	4.2	12.77	24.07	4.4	56.22	10.74	4.4	37.09	49.24	4.6	19.70	42.5
5.2	48.84	17.68	5.2	12.63	24.05	5.4	56.01	10.97	5.4	36.85	49.50	5.6	19.85	42.73
6.2	48.66	17.58	6.2	12.48	24.05	6.4	55.79	11.21	6.4	36.64	49.78	6.6	20.02	42.9
7.2	48.48	17.48	7.2	12.33	24.05	7.4	55.57	11.46	7.4	36.44	50.07	7.6	20.20	43.1
8.2	48.29	17.37	8.2	12.17	24.06	8.4	55.33	11.72	8.4	36.20	50.37	8.5	20.39	43.4
9.2	48.08	17.26	9.2	12.00	24.06	9.4	55.07	11.99	9.4	35.91	50.68	9.5	20.58	43.7
10.1	47.87	17.12	10.2	11.82	24.03	10.4	54.77	12.26	10.4	35.52	50.99	10.5	20.76	44.0
11.1	47.66	16.95	11.2	11.63	23.99	11.4	54.44	12.52	11.4	35.03	51.32	11.5	20.92	44.3
12.1	47.46	16.77	12.2	11.45	23.93	12.4	54.08	12.77	12.4	34.41	51.64	12.5	21.05	44.6
13.1	47.28	16.57	13.2	11.27	23.84	13.4	53.69	13.00	13.4	33.68	51.94	13.5	21.15	44.9
14.1	47.11	16.36	14.2	11.10	23.73	14.4	53.29	13.20	14.4	32.89	52.21	14.5	21.22	45.2
15.1	46.96	16.14	15.2	10.95	23.61	15.4	52.91	13.38	15.4	32.11	52.45	15.5	21.28	45.53
16.1	46.82	15.93	16.2	10.81	23.49	16.4	52.55	13.53	16.4	31.35	52.68	16.5	21.33	45.7
17.1	46.69	15.75	17.2	10.69	23.39	17.4	52.22	13.68	17.4	30.67	52.89	17.5	21.38	46.0
18.1	46.57	15.58	18.2	10.56	23.30	18.3	51.92	13.84	18.4	30.08	53.11	18.5	21.44	46.2
19.1	46.43	15.43	19.2	10.43	23.23	19.3	51.63	14.01	19.4	29.56	53.33	19.5	21.53	46.4
20.1	46.29	15.28	20.2	10.30	23.17	20.3	51.35	14.20	20.4	29.09	53.58	20.5	21.64	46.7
21.1	46.13	15.13	21.2	10.14	23.12	21.3	51.05	14.42	21.4	28.61	53.83	21.5	21.76	46.9
22.1	45.96	14.96	22.2	9.98	23.06	22.3	50.72	14.64	22.4	28.04	54.12	22.5	21.88	47.2
23.1	45.77	14.77	23.2	9.81	22.98	23.3	50.34	14.87	23.4	27.33	54.41	23.5	21.99	47.59
24.1	45.59	14.56	24.2	9.64	22.87	24.3	49.93	15.08	24.4	26.49	54.72	24.5	22.07	47.9
25.1	45.42	14.31	25.2	9.46	22.73	25.3	49.47	15.27	25.4	25.52	55.00	25.5	22.12	48.25
26.1	45.27	14.05	26.2	9.30	22.57	26.3	48.99	15.43	26.4	24.45	55.25	26.5	22.13	48.5
27.1	45.13	13.78	27.2	9.14	22.40	27.3	48.51	15.58	27.4	23.33	55.50	27.5	22.13	48.91
28.1	45.01	13.51	28.2	9.00	22.21	28.3	48.05	15.70	28.4	22.21	55.70	28.5	22.12	49.22
29.1	44.90	13.25	29.2	8.87	22.02	29.3	47.60	15.81	29.4	21.11	55.91	29.5	22.09	49.51
30.1	44.80	13.00	30.2	8.75	21.84	30.3	47.16	15.91	30.4	20.04	56.10	30.5	22.06	49.78
31.1	44.71	12.76	31.2	8.63	21.67	31.3	46.75	16.00	31.4	19.03	56.28	31.5	22.04	50.05
	10.76	-10.72		8.56	-8.50		24.60	-24.58		74.53	-74.53		15.91	-15.88
	$12^h\ 45^m$	$55^s.22$		$14^h\ 13^m$	$9^s.28$		$18^h\ 5^m$	$0^s.43$		$19^h\ 24^m$	$31^s.66$		$22^h\ 15^m$	$43^s.98$
	-84° 39′	43″.10		-83° 16′	47″.50		-87° 39′	52″.55		-89° 13′	43″.28		-86° 24′	3″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
an lar te.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
pt.	12 45	−84 40	Sept.	14 13	−83 17	Sept.	18 5	−87 40	Sept.	19 26	−89 13	Sept.	22 16	−86 23
	s	″		s	″		s	″		s	″		s	″
0.1	44.71	12.76	0.2	8.63	21.67	0.3	46.75	16.00	0.4	79.03	56.28	0.5	22.04	50.05
1.1	44.62	12.53	1.1	8.51	21.51	1.3	46.36	16.11	1.4	78.07	56.46	1.5	22.03	50.32
2.1	44.51	12.30	2.1	8.38	21.36	2.3	45.97	16.23	2.4	77.14	56.66	2.5	22.03	50.59
3.1	44.39	12.08	3.1	8.25	21.22	3.3	45.57	16.35	3.4	76.24	56.86	3.5	22.04	50.87
4.1	44.27	11.85	4.1	8.12	21.07	4.3	45.16	16.49	4.4	75.31	57.08	4.5	22.06	51.15
5.1	44.14	11.62	5.1	7.98	20.92	5.3	44.74	16.64	5.4	74.34	57.31	5.5	22.07	51.45
6.1	44.01	11.37	6.1	7.83	20.76	6.3	44.29	16.78	6.4	73.29	57.54	6.5	22.08	51.77
7.1	43.88	11.11	7.1	7.68	20.59	7.3	43.81	16.92	7.4	72.18	57.77	7.5	22.08	52.09
8.1	43.76	10.83	8.1	7.53	20.39	8.3	43.30	17.05	8.3	70.95	58.00	8.5	22.05	52.43
9.1	43.65	10.53	9.1	7.39	20.17	9.3	42.77	17.16	9.3	69.61	58.22	9.5	21.99	52.77
0.1	43.56	10.22	10.1	7.25	19.93	10.3	42.24	17.24	10.3	68.20	58.40	10.5	21.90	53.10
11.1	43.48	9.90	11.1	7.13	19.68	11.3	41.71	17.29	11.3	66.76	58.57	11.5	21.80	53.40
12.1	43.42	9.59	12.1	7.02	19.42	12.3	41.20	17.31	12.3	65.34	58.70	12.5	21.68	53.69
13.1	43.38	9.30	13.1	6.93	19.18	13.3	40.72	17.32	13.3	63.99	58.80	13.5	21.55	53.95
14.1	43.35	9.03	14.1	6.85	18.95	14.3	40.28	17.33	14.3	62.76	58.90	14.4	21.43	54.19
15.0	43.31	8.77	15.1	6.77	18.73	15.3	39.87	17.35	15.3	61.61	59.03	15.4	21.33	54.43
16.0	43.25	8.53	16.1	6.68	18.53	16.3	39.46	17.39	16.3	60.52	59.15	16.4	21.26	54.67
17.0	43.19	8.29	17.1	6.58	18.35	17.3	39.06	17.45	17.3	59.46	59.29	17.4	21.21	54.92
18.0	43.11	8.05	18.1	6.47	18.17	18.3	38.63	17.53	18.3	58.34	59.46	18.4	21.16	55.19
19.0	43.03	7.78	19.1	6.35	17.97	19.3	38.16	17.62	19.3	57.12	59.64	19.4	21.09	55.49
20.0	42.94	7.49	20.1	6.23	17.75	20.3	37.65	17.69	20.3	55.76	59.81	20.4	21.01	55.80
21.0	42.86	7.17	21.1	6.10	17.51	21.3	37.10	17.74	21.3	54.30	59.98	21.4	20.90	56.12
22.0	42.80	6.83	22.1	5.99	17.23	22.3	36.53	17.77	22.3	52.72	60.13	22.4	20.76	56.45
23.0	42.75	6.49	23.1	5.89	16.94	23.2	35.97	17.77	23.3	51.11	60.25	23.4	20.59	56.76
24.0	42.73	6.15	24.1	5.80	16.63	24.2	35.40	17.75	24.3	49.46	60.35	24.4	20.41	57.05
25.0	42.72	5.82	25.1	5.73	16.33	25.2	34.86	17.70	25.3	47.83	60.42	25.4	20.21	57.32
26.0	42.73	5.50	26.1	5.67	16.04	26.2	34.35	17.65	26.3	46.27	60.47	26.4	20.01	57.58
27.0	42.74	5.18	27.1	5.61	15.75	27.2	33.86	17.59	27.3	44.77	60.53	27.4	19.81	57.81
28.0	42.74	4.88	28.1	5.56	15.47	28.2	33.39	17.54	28.3	43.33	60.57	28.4	19.63	58.04
29.0	42.75	4.60	29.1	5.51	15.21	29.2	32.93	17.49	29.3	41.95	60.62	29.4	19.46	58.27
30.0	42.75	4.32	30.1	5.45	14.96	30.2	32.48	17.45	30.3	40.60	60.69	30.4	19.29	58.50
31.0	42.74	4.05	31.1	5.38	14.71	31.2	32.03	17.43	31.3	39.26	60.76	31.4	19.14	58.74
	10.76	−10.72		8.56	−8.50		24.61	−24.59		74.71	−74.70		15.92	−15.89
	$12^{h}\ 45^{m}$	$55^{s}.22$		$14^{h}\ 13^{m}$	$9^{s}.28$		$18^{h}\ 5^{m}$	$0^{s}.43$		$19^{h}\ 24^{m}$	$31^{s}.66$		$22^{h}\ 15^{m}$	$43^{s}.98$
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Oct.	12 45	−84 39	Oct.	14 13	−83 17	Oct.	18 5	−87 40	Oct.	19 25	−89 13	Oct.	22 16	−86 2
	s	″		s	″		s	″		s	″		s	″
1.0	42.74	64.05	1.1	5.38	14.71	1.2	32.03	17.43	1.3	99.26	60.76	1.4	19.14	58.7
2.0	42.73	63.77	2.1	5.31	14.46	2.2	31.57	17.41	2.3	97.90	60.84	2.4	18.99	58.9
3.0	42.71	63.48	3.1	5.24	14.21	3.2	31.10	17.40	3.3	96.50	60.93	3.4	18.84	59.2
3.9	42.69	63.18	4.1	5.16	13.96	4.2	30.61	17.38	4.3	95.03	61.02	4.4	18.67	59.5
4.9	42.68	62.86	5.1	5.09	13.68	5.2	30.09	17.35	5.3	93.48	61.10	5.4	18.50	59.7
5.9	42.68	62.54	6.1	5.01	13.38	6.2	29.54	17.31	6.3	91.84	61.18	6.4	18.30	60.0
6.9	42.69	62.20	7.1	4.95	13.06	7.2	28.98	17.23	7.3	90.12	61.22	7.4	18.06	60.3
7.9	42.72	61.85	8.0	4.90	12.72	8.2	28.44	17.14	8.3	88.36	61.25	8.4	17.80	60.5
8.9	42.77	61.51	9.0	4.87	12.39	9.2	27.92	17.01	9.3	86.63	61.23	9.4	17.52	60.8
9.9	42.84	61.18	10.0	4.85	12.05	10.2	27.43	16.86	10.3	84.96	61.20	10.4	17.24	61.0
10.9	42.92	60.88	11.0	4.84	11.74	11.2	26.97	16.71	11.3	83.42	61.14	11.4	16.97	61.1
11.9	43.00	60.61	12.0	4.84	11.45	12.2	26.56	16.56	12.3	81.98	61.10	12.4	16.71	61.3
12.9	43.07	60.36	13.0	4.85	11.18	13.2	26.18	16.42	13.3	80.65	61.05	13.4	16.47	61.4
13.9	43.14	60.11	14.0	4.84	10.92	14.2	25.80	16.31	14.2	79.35	61.03	14.4	16.26	61.6
14.9	43.19	59.86	15.0	4.82	10.67	15.2	25.41	16.22	15.2	78.03	61.02	15.4	16.06	61.8
15.9	43.23	59.60	16.0	4.79	10.41	16.2	24.98	16.13	16.2	76.66	61.02	16.4	15.85	62.0
16.9	43.26	59.32	17.0	4.76	10.14	17.2	24.52	16.05	17.2	75.19	61.06	17.4	15.64	62.2
17.9	43.30	59.02	18.0	4.72	9.84	18.2	24.04	15.96	18.2	73.60	61.06	18.4	15.40	62.4
18.9	43.35	58.70	19.0	4.69	9.52	19.2	23.53	15.83	19.2	71.92	61.05	19.4	15.14	62.6
19.9	43.42	58.37	20.0	4.68	9.18	20.2	23.01	15.68	20.2	70.18	61.00	20.3	14.84	62.9
20.9	43.51	58.03	21.0	4.67	8.84	21.2	22.50	15.50	21.2	68.42	60.95	21.3	14.52	63.1
21.9	43.62	57.70	22.0	4.69	8.48	22.2	22.02	15.30	22.2	66.68	60.86	22.3	14.20	63.2
22.9	43.75	57.39	23.0	4.71	8.13	23.2	21.56	15.09	23.2	65.02	60.76	23.3	13.86	63.4
23.9	43.87	57.09	24.0	4.74	7.81	24.2	21.14	14.88	24.2	63.42	60.65	24.3	13.54	63.5
24.9	44.00	56.82	25.0	4.78	7.49	25.2	20.75	14.66	25.2	61.91	60.53	25.3	13.22	63.6
25.9	44.13	56.55	25.9	4.82	7.19	26.2	20.37	14.45	26.2	60.49	60.41	26.3	12.92	63.7
26.9	44.25	56.31	26.9	4.86	6.90	27.2	20.01	14.26	27.2	59.11	60.31	27.3	12.63	63.9
27.9	44.37	56.08	27.9	4.90	6.63	28.2	19.66	14.07	28.2	57.77	60.20	28.3	12.36	64.0
28.9	44.48	55.84	28.9	4.93	6.36	29.2	19.32	13.89	29.2	56.45	60.11	29.3	12.09	64.1
29.9	44.59	55.60	29.9	4.95	6.09	30.1	18.96	13.72	30.2	55.10	60.03	30.3	11.82	64.2
30.9	44.69	55.35	30.9	4.98	5.81	31.1	18.58	13.55	31.2	53.71	59.95	31.3	11.55	64.3
31.9	44.79	55.08	31.9	4.99	5.52	32.1	18.18	13.37	32.2	52.26	59.86	32.3	11.27	64 5
	10.76	−10.71		8.55	−8.50		24.61	−24.59		74.76	−74.76		15.93	−15.90
	$12^{h}\ 45^{m}$	$55^{s}.22$		$14^{h}\ 13^{m}$	$9^{s}.28$		$18^{h}\ 5^{m}$	$0^{s}.43$		$19^{h}\ 24^{m}$	$31^{s}.66$		$22^{h}\ 15^{m}$	$43^{s}.05$
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
ean olar ate.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
ov.	12 45	−84 39	Nov.	14 13	−83 16	Nov.	18 5	−87 40	Nov.	19 25	−89 13	Nov.	22 16	−86 24
	s	″		s	″		s	″		s	″		s	″
0.9	44.79	55.08	0.9	4.99	65.52	1.1	18.18	13.37	1.2	52.26	59.86	1.3	11.27	4.53
1.9	44.90	54.80	1.9	5.02	65.22	2.1	17.77	13.18	2.2	50.73	59.77	2.3	10.96	4.67
2.9	45.02	54.52	2.9	5.05	64.90	3.1	17.35	12.97	3.2	49.13	59.66	3.3	10.63	4.81
3.9	45.17	54.23	3.9	5.10	64.56	4.1	16.93	12.73	4.2	47.52	59.52	4.3	10.28	4.93
4.9	45.33	53.95	4.9	5.16	64.23	5.1	16.54	12.47	5.2	45.92	59.35	5.3	9.91	5.03
5.9	45.51	53.68	5.9	5.23	63.90	6.1	16.18	12.18	6.2	44.38	59.16	6.3	9.54	5.10
6.9	45.71	53.44	6.9	5.33	63.59	7.1	15.86	11.89	7.2	42.98	58.94	7.3	9.18	5.14
7.9	45.90	53.22	7.9	5.43	63.29	8.1	15.59	11.60	8.2	41.70	58.72	8.3	8.83	5.16
8.9	46.10	53.03	8.9	5.53	63.02	9.1	15.36	11.32	9.2	40.53	58.50	9.3	8.50	5.16
9.9	46.29	52.86	9.9	5.62	62.77	10.1	15.13	11.06	10.2	39.44	58.31	10.3	8.19	5.17
10.9	46.46	52.70	10.9	5.71	62.55	11.1	14.92	10.82	11.2	38.41	58.12	11.3	7.91	5.18
11.9	46.61	52.53	11.9	5.79	62.32	12.1	14.69	10.60	12.2	37.34	57.97	12.3	7.64	5.22
12.9	46.75	52.35	12.9	5.86	62.08	13.1	14.44	10.39	13.2	36.18	57.82	13.3	7.36	5.28
13.9	46.90	52.15	13.9	5.92	61.82	14.1	14.15	10.16	14.2	34.93	57.68	14.3	7.07	5.34
14.9	47.05	51.92	14.9	5.98	61.54	15.1	13.83	9.92	15.2	33.60	57.51	15.3	6.74	5.42
15.9	47.22	51.68	15.9	6.06	61.25	16.1	13.51	9.66	16.2	32.21	57.32	16.3	6.39	5.48
16.9	47.41	51.45	16.9	6.15	60.94	17.1	13.20	9.37	17.2	30.79	57.11	17.3	6.03	5.52
17.9	47.62	51.22	17.9	6.26	60.63	18.1	12.90	9.05	18.2	29.39	56.87	18.3	5.65	5.54
18.9	47.84	51.01	18.9	6.38	60.33	19.1	12.64	8.72	19.1	28.08	56.62	19.3	5.26	5.53
19.9	48.07	50.81	19.9	6.51	60.04	20.1	12.41	8.39	20.1	26.86	56.35	20.3	4.88	5.52
20.9	48.30	50.64	20.9	6.64	59.77	21.1	12.23	8.05	21.1	25.72	56.08	21.3	4.51	5.47
21.9	48.53	50.49	21.9	6.78	59.52	22.1	12.07	7.72	22.1	24.69	55.80	22.3	4.16	5.42
22.9	48.76	50.35	22.9	6.92	59.29	23.1	11.93	7.41	23.1	23.74	55.54	23.3	3.82	5.36
23.9	48.97	50.22	23.9	7.05	59.07	24.1	11.80	7.11	24.1	22.85	55.28	24.3	3.50	5.29
24.9	49.18	50.10	24.9	7.18	58.86	25.1	11.67	6.82	25.1	21.97	55.03	25.3	3.19	5.24
25.9	49.39	49.98	25.9	7.31	58.65	26.1	11.55	6.55	26.1	21.11	54.80	26.2	2.90	5.19
26.9	49.58	49.86	26.9	7.42	58.45	27.1	11.42	6.28	27.1	20.23	54.58	27.2	2.61	5.15
27.8	49.78	49.73	27.9	7.54	58.24	28.1	11.26	6.01	28.1	19.30	54.35	28.2	2.31	5.12
28.8	49.98	49.59	28.9	7.65	58.02	29.1	11.10	5.73	29.1	18.32	54.12	29.2	2.00	5.09
29.8	50.19	49.44	29.9	7.77	57.78	30.1	10.92	5.43	30.1	17.28	53.88	30.2	1.66	5.07
30.8	50.41	49.29	30.9	7.91	57.54	31.1	10.75	5.11	31.1	16.21	53.61	31.2	1.31	5.02
31.8	50.65	49.14	31.9	8.05	57.29	32.1	10.60	4.77	32.1	15.16	53.33	32.2	0.94	4.96
	10.75	−10.71		8.55	−8.49		24.59	−24.57		74.67	−74.66		15.93	−15.90
	$12^{h}\ 45^{m}$	$55^{s}.22$		$14^{h}\ 13^{m}$	$9^{s}.28$		$18^{h}\ 5^{m}$	$0^{s}.43$		$19^{h}\ 24^{m}$	$31^{s}.66$		$22^{h}\ 15^{m}$	$43^{s}.98$
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			δ Octantis. Mag. 4.1			χ Octantis. Mag. 5.2			σ Octantis. Mag. 5.5			υ Octantis. Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
Dec.	12 45	−84 39	Dec.	14 13	−83 16	Dec.	18 5	−87 39	Dec.	19 25	−89 13	Dec.	22 15	−86 23
	s	″		s	″		s	″		s	″		s	″
0.8	50.41	49.29	0.9	7.91	57.54	1.1	10.75	65.11	1.1	16.21	53.61	1.2	61.31	65.00
1.8	50.65	49.14	1.9	8.05	57.29	2.1	10.60	64.77	2.1	15.16	53.33	2.2	60.94	64.96
2.8	50.91	49.00	2.9	8.21	57.04	3.1	10.48	64.41	3.1	14.18	53.00	3.2	60.56	64.87
3.8	51.18	48.89	3.9	8.39	56.81	4.1	10.40	64.03	4.1	13.30	52.66	4.2	60.19	64.75
4.8	51.46	48.80	4.9	8.58	56.59	5.0	10.37	63.66	5.1	12.56	52.30	5.2	59.83	64.59
5.8	51.73	48.75	5.9	8.77	56.41	6.0	10.39	63.29	6.1	11.97	51.97	6.2	59.50	64.43
6.8	51.99	48.72	6.9	8.96	56.26	7.0	10.44	62.95	7.1	11.50	51.63	7.2	59.20	64.25
7.8	52.23	48.71	7.9	9.14	56.13	8.0	10.50	62.63	8.1	11.10	51.32	8.2	58.92	64.08
8.8	52.47	48.69	8.9	9.31	56.00	9.0	10.55	62.34	9.1	10.71	51.03	9.2	58.66	63.93
9.8	52.69	48.66	9.9	9.46	55.88	10.0	10.58	62.06	10.1	10.27	50.76	10.2	58.41	63.80
10.8	52.90	48.62	10.9	9.61	55.74	11.0	10.57	61.78	11.1	9.74	50.48	11.2	58.14	63.69
11.8	53.12	48.56	11.9	9.75	55.59	12.0	10.54	61.49	12.1	9.13	50.21	12.2	57.85	63.59
12.8	53.35	48.49	12.9	9.91	55.41	13.0	10.51	61.18	13.1	8.45	49.93	13.2	57.55	63.48
13.8	53.59	48.42	13.9	10.07	55.22	14.0	10.46	60.85	14.1	7.73	49.62	14.2	57.22	63.36
14.8	53.85	48.35	14.9	10.25	55.03	15.0	10.44	60.49	15.1	7.04	49.28	15.2	56.88	63.21
15.8	54.13	48.29	15.9	10.45	54.85	16.0	10.45	60.11	16.1	6.41	48.92	16.2	56.53	63.04
16.8	54.41	48.25	16.9	10.65	54.67	17.0	10.50	59.72	17.1	5.87	48.56	17.2	56.19	62.85
17.8	54.70	48.23	17.9	10.86	54.52	18.0	10.58	59.34	18.1	5.44	48.19	18.2	55.86	62.65
18.8	54.99	48.24	18.9	11.07	54.39	19.0	10.70	58.97	19.1	5.12	47.81	19.2	55.55	62.43
19.8	55.27	48.26	19.9	11.28	54.28	20.0	10.84	58.62	20.1	4.89	47.44	20.2	55.26	62.20
20.8	55.53	48.30	20.8	11.48	54.19	21.0	11.00	58.29	21.1	4.73	47.10	21.2	55.00	61.97
21.8	55.79	48.35	21.8	11.68	54.11	22.0	11.16	57.96	22.1	4.62	46.75	22.2	54.75	61.76
22.8	56.04	48.40	22.8	11.88	54.04	23.0	11.32	57.65	23.1	4.53	46.44	23.2	54.51	61.54
23.8	56.28	48.45	23.8	12.07	53.97	23.9	11.48	57.36	24.1	4.45	46.13	24.2	54.28	61.33
24.8	56.51	48.48	24.8	12.25	53.90	24.9	11.62	57.07	25.1	4.33	45.82	25.2	54.04	61.14
25.8	56.74	48.51	25.8	12.42	53.83	25.9	11.75	56.78	26.0	4.16	45.51	26.2	53.80	60.95
26.8	56.98	48.54	26.8	12.60	53.74	26.9	11.87	56.48	27.0	3.95	45.20	27.2	53.55	60.70
27.8	57.22	48.55	27.8	12.79	53.64	27.9	11.98	56.16	28.0	3.69	44.87	28.2	53.28	60.50
28.8	57.49	48.57	28.8	12.99	53.53	28.9	12.11	55.81	29.0	3.44	44.52	29.2	52.99	60.31
29.8	57.77	48.60	29.8	13.20	53.43	29.9	12.26	55.45	30.0	3.23	44.15	30.2	52.70	60.10
30.8	58.06	48.64	30.8	13.42	53.33	30.9	12.45	55.07	31.0	3.12	43.76	31.2	52.41	59.93
31.8	58.35	48.72	31.8	13.66	53.26	31.9	12.68	54.70	32.0	3.15	43.37	32.1	52.13	59.74
	10.75	−10.70		8.55	−8.49		24.56	−24.54		74.45	−74.44		15.93	−15.90
	$12^h\ 45^m$	$55^s.22$		$14^h\ 13^m$	$9^s.28$		$18^h\ 5^m$	$0^s.43$		$19^h\ 24^m$	$31^s.66$		$22^h\ 15^m$	$43^s.08$
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.31

EAN ERRORS OF NEWCOMB'S PLACES FOR 1920 OF STARS OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

at. o.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.	
					a	δ						a	δ
		h	m	°	s	″			h	m	°	s	″
1	33 Piscium	0	1	−6	.018	.25	109	ε Sculpt.	1	42	−25	.037	.46
3	α Androm.		4	+29	.010	.13	116	ζ Ceti		48	−11	.020	.24
4	β Cassiop.		5	+59	.017	.17	118	α Trianguli		49	+29	.022	.22
5	ε Phœnicis		5	−46	.051	.41	117	ε Cassiop.		49	+63	.017	.17
6	22 Androm.		6	+46	.024	.28	120	ξ Piscium		49	+3	.018	.23
10	γ Pegasi	0	9	+15	.011	.14	121	β Arietis	1	50	+20	.013	.20
14	σ Androm.		14	+36	.029	.33	122	ψ Phœnicis		50	−47	.080	.81
15	ι Ceti		15	−9	.014	.20	127	υ Ceti		56	−21	.025	.32
16	ζ Tucanæ		16	−65	.047	.38	129	α Hydri		56	−62	.049	.34
19	44 Piscium		21	+1	.018	.22	126	50 Cassiop.		57	+72	.016	.17
20	β Hydri	0	22	−78	....	...	131	γ Andr. *pr.*	1	59	+42	.016	.16
21	α Phœnicis		22	−43	.047	.31	133	α Arietis	2	3	+23	.010	.14
23	12 Ceti		26	−4	.017	.21	134	β Trianguli		5	+35	.018	.21
30	13 Ceti		31	−4	.023	.30	136	55 Cassiop.		8	+66	.025	.24
31	ζ Cassiop.		33	+53	.021	.20	137	6 Persei		8	+51	.025	.27
32	π Androm.	0	33	+33	.021	.21	138	ξ^1 Ceti	2	9	+8	.018	.23
35	ε Androm.		34	+29	.016	.19	139	μ Fornacis		9	−31	.076	.83
36	δ Androm.		35	+30	.018	.22	141	γ Trianguli		13	+33	.024	.31
37	α Cassiop.		36	+56	.012	.14	142	67 Ceti		13	−7	.021	.25
38	μ Phœnicis		38	−47	....	.53	144	φ Eridani		14	−52	.049	.42
39	β Ceti	0	40	−18	.013	.17	145	ο Ceti	2	15	−3	.018	.23
42	ο Cassiop.		40	+48	.034	.26	146	κ Fornacis		19	−24	.049	.47
41	21 Cassiop.		40	+75	.017	.24	148	δ Hydri		20	−69	....	...
45	ζ Androm.		43	+24	.019	.24	149	ι Cassiop.		22	+67	.025	.25
46	η Cassiop.		44	+57	.017	.24	153	ξ^2 Ceti		24	+8	.014	.19
49	δ Piscium	0	45	+7	.014	.20	156	σ Ceti	2	28	−16	.028	.37
52	λ Hydri		46	−75	....	.70	157	36 H. Cassiop.		30	+72	.021	.22
53	20 Ceti		49	−2	.018	.26	160	ν Ceti		32	+5	.020	.26
54	γ Cassiop.		52	+60	.018	.22	163	μ Hydri		33	−79	.056	.70
55	μ Androm.		52	+38	.017	.21	161	ν Arietis		34	+22	.020	.26
58	α Sculptoris	0	55	−30	.025	.23	165	δ Ceti	2	35	−0	.014	.20
59	43 H. Cephei		58	+86	.010	.17	172	ε Hydri		38	−69	....	...
61	ε Piscium	0	59	+7	.012	.26	170	θ Persei		39	+49	.021	.19
66	β Phœnicis	1	3	−47	.050	.47	173	γ Ceti *seq.*		39	+3	.016	.20
65	μ Cassiop.		3	+55	.022	.27	174	π Ceti		40	−14	.025	.25
69	η Ceti	1	5	−11	.025	.22	175	μ Ceti	2	41	+10	.020	.21
71	β Androm.		5	+35	.013	.17	177	η Persei		45	+56	.010	.25
74	τ Piscium		7	+30	.019	.33	178	41 Arietis		45	+27	.020	.22
76	ζ Piscium		10	+7	.019	.24	179	β Fornacis		46	−33	.050	.47
78	κ Tucanæ		13	−69	....	...	180	σ Arietis		47	+15	.018	.24
79	*f* Piscium	1	14	+3	.022	.29	181	τ^2 Eridani	2	47	−21	.022	.32
80	υ Piscium		15	+27	.022	.25	182	τ Persei		49	+52	.020	.19
85	θ Ceti		20	−9	.013	.19	183	η Eridani		53	−9	.016	.21
86	δ Cassiop.		21	+60	.018	.19	185	ε Arietis		55	+21	.016	.23
91	γ Phœnicis		25	−44	.044	.35	187	θ Eridani		55	−41	.056	.42
90	38 Cassiop.	1	25	+70	.026	.28	184	47 H. Cephei	2	55	+79	.035	.32
94	η Piscium		27	+15	.020	.19	189	α Ceti		58	+4	.010	.13
89	α Urs. Min.		32	+89	....	...	191	τ^3 Eridani		59	−24	.029	.32
96	40 Cassiop.		32	+73	.028	.25	190	γ Persei	2	59	+53	.029	.20
97	υ Androm.		32	+41	.024	.26	192	ρ Persei	3	0	+39	.019	.24
98	π Piscium	1	33	+12	.022	.25	194	μ Horologii	3	2	−60	.060	.49
99	υ Persei		33	+48	.018	.19	197	θ Hydri		2	−72	.046	.47
101	α Eridani		35	−58	....	...	195	β Persei		3	+41	.016	.20
103	ω Cassiop.		36	+68	.025	.25	199	δ Arietis		7	+19	.014	.17
104	ν Piscium		37	+5	.014	.20	202	12 Eridani		9	−29	.022	.30
105	φ Persei	1	39	+50	.022	.20	200	48 H. Cephei	3	10	+77	.032	.32
107	τ Ceti		40	−16	.020	.25	203	ζ Arietis		10	+21	.018	.29
108	ο Piscium		41	+9	.013	.19	204	38 Horologii(G.)		11	−58	....	...
112	4 Octantis(G.)	1	42	−85	.039	.40	206	ζ Eridani	3	12	−9	.022	.31

MEAN ERRORS OF NEWCOMB'S PLACES FOR 1920 OF STARS OF THE AMERICA EPHEMERIS AND NAUTICAL ALMANAC.

Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Err 1920.
					α	δ						α
		h	m	°	s	″			h	m	°	s
209	τ Arietis	3	17	+21	.027	.32	319	η Aurigæ	5	1	+41	.021
210	e Eridani		17	−43	.056	.49	320	ε Leporis		2	−22	.021
212	ι Hydri		18	−78	....	...	322	β Eridani		4	−5	.016
211	α Persei		19	+50	.013	.14	327	μ Aurigæ		8	+38	.028
213	o Tauri		21	+9	.014	.21	328	μ Leporis		9	−16	.032
214	2 H. Camel.	3	23	+60	.028	.37	326	19 H.Camel.	5	9	+79	.025
215	ξ Tauri		23	+9	.023	.22	330	β Orionis		11	−8	.009
219	f Tauri		26	+13	.016	.22	329	α Aurigæ		11	+46	.012
221	ε Eridani		29	−10	.014	.17	332	λ Aurigæ		14	+40	.027
222	τ^5 Eridani		30	−22	.031	.40	333	τ Orionis		14	−7	.014
230	δ Persei	3	37	+48	.016	.16	335	o Columbæ	5	15	−35	.068
235	δ Eridani		39	−10	.020	.24	342	γ Orionis		21	+6	.017
234	ν Persei		40	+42	.024	.25	343	β Tauri		21	+29	.010
237	5 H. Camel.		42	+71	.025	.29	344	17 Camelop.		23	+63	.029
238	η Tauri		43	+24	.014	.17	347	β Leporis		25	−21	.025
239	τ^6 Eridani	3	43	−23	.023	.30	348	χ Aurigæ	5	28	+32	.022
243	g Eridani		46	−36	.073	.63	350	δ Orionis		28	−0	.012
246	γ Hydri		48	−74	.031	.29	349	Gr. 966		29	+75	.022
244	ζ Persei		49	+32	.019	.22	354	α Leporis		29	−18	.018
245	9 H. Camel.		50	+61	.031	.33	355	ϕ^1 Orionis		30	+9	.021
248	ε Persei	3	52	+40	.019	.22	359	ι Orionis	5	32	−6	.022
250	ξ Persei		54	+36	.019	.22	361	ε Orionis		32	−1	.013
251	γ Eridani		54	−14	.017	.19	362	ζ Tauri		33	+21	.019
252	λ Tauri		56	+12	.018	.22	356	Gr. 944		36	+85	.030
254	δ Reticuli		57	−62	.044	.36	366	ζ Orionis		37	−2	.016
255	ν Tauri	3	59	+6	.018	.22	368	α Columbæ	5	37	−34	.024
256	A Tauri	4	0	+22	.020	.23	369	o Aurigæ		40	+50	.028
260	c Persei		3	+47	.020	.22	372	ζ Leporis		43	−15	.023
263	p Tauri		6	+26	.030	.37	373	κ Orionis		44	−10	.013
265	o^1 Eridani		8	−7	.016	.23	375	δ Doradus		45	−66	....
264	Gr. 750	4	11	+85	.017	.24	381	31 Mensæ (G.)	5	46	−85	.042
268	μ Tauri		11	+9	.027	.47	374	ν Aurigæ		46	+39	.021
270	α Horologii		11	−42	.073	.69	378	δ Leporis		48	−21	.036
271	α Reticuli		13	−63	.061	.54	382	α Orionis		51	+7	.008
274	γ Tauri		15	+15	.013	.21	385	η Leporis		53	−14	.022
277	δ Tauri	4	18	+17	.017	.23	383	δ Aurigæ	5	53	+54	.026
279	υ^5 Eridani		21	−34	.046	.42	387	β Aurigæ		54	+45	.016
284	δ Mensæ		23	−80	.058	.52	388	θ Aurigæ		54	+37	.020
281	ε Tauri		24	+19	.013	.20	393	1 Gemin.	5	59	+23	.021
285	m Persei		28	+43	.031	.34	395	1 Puppis (G.)	6	2	−45	.057
288	α Tauri	4	31	+16	.009	.13	396	ν Orionis	6	3	+15	.016
291	α Doradus		32	−55	.054	.40	402	22 H.Camel.		10	+69	.022
289	ν Eridani		32	−4	.018	.24	405	η Gemin.		10	+23	.014
292	53 Eridani		35	−14	.023	.28	406	2 Lyncis		13	+59	.023
296	τ Tauri		37	+23	.014	.23	411	ζ Can. Maj.		17	−30	.055
297	α Cœli	4	38	−42	.050	.46	412	μ Gemin.	6	18	+23	.013
294	Gr. 848		38	+76	.024	.30	413	ψ^1 Aurigæ		19	+49	.025
298	4 Camelop.		41	+57	.027	.25	414	β Can. Maj.		19	−18	.019
299	μ Eridani		42	−3	.016	.21	415	8 Monoc.		20	+5	.022
303	π^3 Orionis		45	+7	.021	.22	416	α Argûs		22	−53	....
302	9 Camelop.	4	46	+66	.021	.19	418	10 Monoc.	6	24	−5	.017
304	i Tauri		47	+19	.023	.31	419	ν Gemin.		24	+20	.027
307	π^5 Orionis		50	+2	.016	.22	423	8 Lyncis		30	+62	.022
309	ι Aurigæ		52	+33	.014	.17	425	ξ^2 Can. Maj.		32	−23	.034
313	ε Aurigæ		56	+44	.021	.19	424	23 H.Camel.		33	+80	.024
312	β Camelop.	4	56	+60	.023	.19	427	γ Gemin.	6	33	+16	.013
314	ζ Aurigæ		57	+41	.017	.22	426	51 Aurigæ		33	+39	.025
316	ι Tauri	4	58	+21	.019	.26	429	ν Argûs		35	−43	.058
318	11 Orionis	5	0	+15	.020	.35	430	S Monoc.	6	37	+10	.016

EAN ERRORS OF NEWCOMB'S PLACES FOR 1920 OF STARS OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

ıt. o.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.	
					α	δ						α	δ
		h	m	°	s	″			h	m	°	s	″
1	ε Gemin.	6	39	+25	.014	.19	536	30 Monoc.	8	22	− 4	.017	.23
3	ξ Gemin.		41	+13	.013	.21	539	θ Chamæl.		23	−77	.050	.40
2	ψ^5 Aurigæ		41	+44	.029	.24	537	ο Urs. Maj.		24	+61	.014	.15
4	α Can. Maj.		42	−17	....	.16	543	Gr. 1450		28	+38	.047	.43
5	18 Monoc.		44	+ 3	.020	.25	544	η Cancri		28	+21	.019	.20
6	43 Camelop.	6	45	+69	.027	.24	545	Gr. 1446	8	31	+74	.032	.38
3	ζ Mensæ		47	−81	.048	.47	547	δ Hydræ		33	+ 6	.019	.26
1	α Pictoris		47	−62	.061	.63	548	σ Hydræ		35	+ 4	.023	.27
0	θ Gemin.		48	+34	.020	.22	554	γ Cancri		39	+22	.016	.21
2	τ Argûs		48	−51	.069	.64	556	δ Cancri		40	+18	.017	.21
4	15 Lyncis	6	50	+59	.023	.21	557	α Pyxidis	8	40	−33	.053	.42
6	θ Can. Maj.		50	−12	.021	.31	558	ι Cancri		42	+29	.025	.26
1	ε Can. Maj.		55	−29	.017	.23	560	δ Argûs		42	−54	.053	.41
4	ζ Gemin.	6	59	+21	.016	.19	559	ε Hydræ		43	+ 7	.014	.19
5	o^2 Can. Maj.	7	0	−24	.025	.29	566	σ^2 Cancri		49	+31	.022	.31
56	γ Can. Maj.	7	0	−16	.021	.28	567	ζ Hydræ	8	51	+ 6	.018	.24
49	51 H. Cephei		4	+87	....	...	569	ι Urs. Maj.		54	+48	.016	.17
50	δ Can. Maj.		5	−26	.020	.24	571	α Cancri		54	+12	.015	.20
61	63 Aurigæ		6	+39	.021	.26	574	b^1 Carinæ		55	−59	.044	.43
64	51 Gemin.		9	+16	.023	.37	576	κ Urs. Maj.	8	58	+47	.018	.19
65	γ^2 Volantis	7	9	−70	.071	.64	582	σ^2 Urs. Maj.	9	3	+67	.020	.28
69	λ Gemin.		13	+17	.013	.22	583	κ Cancri		3	+11	.016	.22
70	π Argûs		14	−37	.046	.34	585	λ Argûs		5	−43	.039	.32
67	25 H. Camel.		14	+83	.025	.24	590	ζ Octantis		9	−85	.041	.38
80	7 Octant. (G.)		15	−87	.053	.46	589	θ Hydræ		10	+ 3	.014	.19
71	δ Gemin.	7	15	+22	.014	.17	591	β Argûs	9	12	−69	.035	.28
74	δ Volantis		17	−68	.061	.64	593	83 Cancri		15	+18	.018	.24
76	ι Gemin.		21	+28	.014	.22	594	ι Argûs		15	−59	....	...
77	η Can. Maj.		21	−29	.021	.25	595	40 Lyncis		16	+35	.018	.21
78	Gr. 1308		23	+69	.028	.26	596	θ Pyxidis		18	−26	.046	.61
79	β Can. Min.	7	23	+ 8	.014	.19	599	α Hydræ	9	24	− 8	.010	.15
81	ρ Gemin.		24	+32	.021	.27	601	h Urs. Maj.		25	+63	.019	.19
83	σ Argûs		27	−43	.060	.46	600	1 H. Draco.		26	+82	.016	.20
84	α^2 Gemin		29	+32	.019	.14	603	d Urs. Maj.		27	+70	.025	.24
88	25 Monoc.		33	− 4	.040	.42	604	θ Urs. Maj.		28	+52	.017	.17
92	α Can. Min.	7	35	+ 5	....	.15	606	ψ Argûs	9	28	−40	.056	.51
93	24 Lyncis		36	+59	.033	.29	605	ξ Leonis		28	+12	.024	.30
95	κ Gemin.		40	+25	.018	.22	607	10 Leo. Min.		29	+37	.020	.27
96	β Gemin.		40	+28	.010	.12	620	ζ Chamæl.		36	−81	.047	.48
99	4 Puppis		42	−14	.028	.36	619	ο Leonis		37	+10	.014	.16
02	ξ Argûs	7	46	−25	.021	.27	622	θ Antliæ	9	41	−27	.057	.49
05	φ Gemin.		49	+27	.018	.28	623	ε Leonis		41	+24	.014	.17
06	26 Lyncis		49	+48	.022	.30	627	υ Argûs		45	−65	.049	.38
07	Gr. 1374		51	+74	.029	.32	626	υ Urs. Maj.		45	+59	.013	.17
14	χ Argûs		55	−53	.052	.40	629	6 Sextantis		47	− 4	.030	.35
15	ω Cancri	7	56	+26	.022	.30	630	μ Leonis	9	48	+26	.014	.19
17	χ Gemin.	7	59	+28	.018	.24	632	Gr. 1586		51	+73	.026	.32
20	27 Lyncis	8	2	+52	.022	.23	634	19 Leo. Min.		53	+41	.022	.24
23	ρ Argûs		4	−24	.018	.24	636	φ Argûs		54	−54	.045	.37
22	3 H. Ur. Maj.		5	+69	.025	.29	638	π Leonis	9	56	+ 8	.012	.20
25	γ Argûs	8	7	−47	.051	.44	641	η Leonis	10	3	+17	.022	.22
26	ζ Cancri		8	+18	.022	.25	642	α Leonis		4	+12	.015	.13
27	Br. 1147		10	+76	.026	.31	644	λ Hydræ		7	−12	.019	.24
28	20 Puppis		10	−16	.023	.32	645	q Velorum		11	−42	.088	.76
29	β Cancri		12	+ 9	.013	.24	646	32 Urs. Maj.		12	+66	.024	.25
33	31 Lyncis	8	17	+43	.027	.22	648	ζ Leonis	10	12	+24	.018	.22
18	Gr. 1119		19	+89	.025	...	647	λ Urs. Maj.		12	+43	.017	.16
34	d^1 Cancri		19	+19	.022	.29	653	γ Leonis *pr.*		16	+20	.019	.15
35	ε Argûs	8	21	−59	.038	.33	657	μ Urs. Maj.	10	18	+42	.016	.19

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Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.		Cat. No.	Name	R. A. 1920.	Decl. 1920.	Mean Err 1920.	
				α	δ					α	δ
		h m	°	s	″			h m	°	s	′
658	30 H. Ur. Maj.	10 18	+66	.031	.27	770	β Chamæl.	12 14	−79	.037	.3
659	30 H. Camel.	21	+83	.026	.30	772	Br. 1672	14	+88	.016	.2
661	μ Hydræ	22	−16	.018	.22	773	η Virginis	16	− 0	.013	.1
662	31 Leo. Min.	23	+37	.019	.24	780	α^1 Crucis	22	−63	....	..
664	α Antliæ	23	−31	.044	.35	787	20 Comæ	26	+21	.034	.3
666	36 Urs. Maj.	10 26	+56	.022	.25	786	δ Corvi	12 26	−16	.018	.2
668	9 H. Draco.	28	+76	.019	.21	789	γ Crucis	27	−57	.084	.1
669	ρ Leonis	29	+10	.016	.21	791	8 Can. Ven.	30	+42	.022	.1
679	33 Sextantis	37	− 1	.024	.31	793	κ Draconis	30	+70	.018	.1
683	41 Leo. Min.	39	+24	.022	.26	792	β Corvi	30	−23	.019	.1
684	θ Argûs	10 40	−64	.052	.41	795	24 Comæ *seq.*	12 31	+19	.025	.3
685	42 Leo. Min.	41	+31	.019	.28	796	α Muscæ	32	−69	.063	.3
687	η Argûs	42	−59	....	...	799	χ Virginis	35	− 8	.024	.3
688	μ Argûs	43	−49	.049	.37	800	γ Centauri	37	−49	.041	.3
691	δ^2 Chamæl.	45	−80	.047	.39	801	γ Virginis	38	− 1	.018	.2
689	l Leonis	10 45	+11	.015	.20	802	ρ Virginis	12 38	+11	.023	.3
690	ν Hydræ	46	−16	.022	.24	803	76 Urs. Maj.	38	+63	.034	.2
692	46 Leo. Min.	49	+35	.019	.21	808	β Crucis	43	−59	.034	.3
694	54 Leonis	51	+25	.027	.35	810	ι Octantis	46	−85	.046	.3
696	ι Antliæ	53	−37	.072	.95	812	31 Comæ	48	+28	.024	.1
695	Gr. 1706	10 54	+78	.034	.40	814	32 H. Camel.	12 49	+84	.021	.1
698	α Crateris	56	−18	.020	.25	813	n Centauri	49	−40	.068	[illegible]
699	d Leonis	56	+ 4	.018	.24	816	ε Urs. Maj.	51	+56	.017	.2
701	β Urs. Maj.	57	+57	.017	.16	817	δ Virginis	52	+ 4	.013	.1
702	α Urs. Maj.	10 59	+62	.016	.15	818	α Can. Ven.	52	+39	.014	.1
704	η Octantis	11 0	−84	.044	.42	820	δ Muscæ	12 57	−71	.017	.3
703	χ Leonis	1	+ 8	.013	.19	821	ε Virginis	12 58	+11	.013	.1
706	p^4 Leonis	3	+ 2	.022	.25	827	θ Virginis	13 6	− 5	.014	.1
708	ψ Urs. Maj.	5	+45	.016	.17	830	43 Comæ	8	+28	.019	.2
710	β Crateris	8	−22	.021	.33	836	20 Can. Ven.	14	+41	.024	.2
712	δ Leonis	11 10	+21	.014	.16	838	γ Hydræ	13 15	−23	.022	.3
713	θ Leonis	10	+16	.019	.21	839	ι Centauri	16	−36	.056	[illegible]
718	ν Urs. Maj.	14	+34	.021	.21	842	ζ^1 Urs. Maj.	21	+55	.020	.1
719	δ Crateris	15	−14	.017	.19	843	α Virginis	21	−11	.008	.1
720	σ Leonis	17	+ 6	.014	.19	846	Gr. 2001	24	+73	.026	.3
721	π Centauri	11 17	−54	....	...	845	70 Virginis	13 25	+14	.025	.3
723	ι Leonis	20	+11	.018	.21	847	κ Octantis	28	−85	.039	.3
727	τ Leonis	24	+ 3	.016	.21	852	ζ Virginis	31	− 0	.010	.1
730	λ Draconis	27	+70	.016	.16	854	17 H. Can. Ven.	31	+38	.041	.4
731	ξ Hydræ	29	−31	.050	.39	857	ε Centauri	35	−53	.039	.3
733	λ Centauri	11 32	−63	.053	.48	859	m Virginis	13 37	− 8	.015	.2
734	υ Leonis	33	− 0	.016	.18	863	τ Boötis	43	+18	.018	.1
735	π Chamæl.	34	−75	.079	.80	866	η Urs. Maj.	44	+50	.012	.1
737	3 Draconis	38	+67	.025	.25	867	89 Virginis	46	−18	.027	.35
738	ζ Crateris	41	−18	.019	.29	871	ζ Centauri	51	−47	.042	.33
740	χ Urs. Maj.	11 42	+48	.016	.17	872	η Boötis	13 51	+19	.012	.17
744	β Leonis	45	+15	.010	.14	878	θ Apodis	57	−76	....	...
745	β Virginis	47	+ 2	.012	.14	880	11 Boötis	58	+28	.023	.26
747	Gr. 1830	48	+38	.037	.32	879	τ Virginis	58	+ 2	.013	.18
748	γ Urs. Maj.	50	+54	.012	.14	881	β Centauri	13 58	−60	....	...
753	π Virginis	11 57	+ 7	.016	.21	882	π Hydræ	14 2	−26	.021	.2
758	ο Virginis	12 1	+ 9	.016	.15	883	θ Centauri	2	−36	.044	.33
760	δ Centauri	4	−50	.067	.46	885	α Draconis	2	+65	.016	.17
762	ε Corvi	6	−22	.020	.23	888	d Boötis	7	+25	.023	.38
763	4 H. Draco.	8	+78	.017	.19	889	κ Virginis	9	−10	.013	.31
765	δ Crucis	12 11	−58	.058	.45	890	4 Urs. Min.	14 9	+78	.018	.24
766	δ Urs. Maj.	11	+57	.020	.17	891	ι Virginis	12	− 6	.017	.21
767	γ Corvi	12	−17	.019	.20	893	α Boötis	12	+20	.008	.13
768	2 Can. Ven.	12 12	+41	.032	.32	894	λ Boötis	14 13	+46	.019	.21

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t. o.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.	
				α	δ					α	δ
		h m	°	s	″			h m	°	s	″
92	δ Octantis	14 14	−83	.035	.30	1011	ε Cor. Bor.	15 54	+27	.023	.24
98	λ Virginis	15	−13	.017	.24	1012	δ Scorpii	15 56	−22	.020	.26
01	2 Libræ	19	−11	.025	.33	1019	θ Draconis	16 0	+59	.018	.17
04	θ Boötis	22	+52	.018	.17	1017	β Scorpii	1	−20	.014	.17
05	*f* Boötis	23	+20	.021	.26	1021	κ Herculis	4	+17	.028	.33
07	φ Virginis	14 24	− 2	.018	.25	1027	Gr. 2320	16 6	+68	.032	.35
11	5 Urs. Min.	28	+76	.019	.21	1026	φ Herculis	6	+45	.025	.22
10	ρ Boötis	28	+31	.016	.19	1023	δ^1 Apodis	8	−78	.053	.49
12	γ Boötis	29	+39	.017	.21	1030	δ Ophiuchi	10	− 3	.012	.17
14	η Centauri	30	−42	.045	.37	1031	σ Cor. Bor. *seq.*	12	+34	.037	.42
15	σ Boötis	14 31	+30	.025	.32	1034	19 Urs. Min.	16 13	+76	.029	.23
17	α^2 Centauri	34	−61	....	...	1032	γ^2 Normæ	14	−50	.049	.38
19	33 Boötis	36	+45	.034	.33	1033	ε Ophiuchi	14	− 4	.014	.22
21	α Apodis	38	−79	.044	.47	1035	σ Scorpii	16	−25	.019	.28
26	μ Virginis	39	− 5	.014	.21	1036	τ Herculis	17	+47	.022	.20
930	ε Boötis	14 41	+27	.016	.16	1039	γ Herculis	16 18	+19	.016	.21
932	109 Virginis	42	+ 2	.018	.22	1045	η Urs. Min.	20	+76	.022	.22
934	8 Libræ	46	−16	.018	.20	1041	γ Apodis	21	−79	.033	.38
936	α Libræ	46	−16	.010	.14	1046	ω Herculis	22	+14	.030	.37
941	Gr. 2164	49	+60	.033	.35	1050	η Draconis	23	+62	.018	.17
944	β Urs. Min.	14 51	+74	.016	.16	1051	α Scorpii	16 24	−26	.013	.21
945	ξ^2 Libræ	52	−11	.018	.23	1056	β Herculis	27	+22	.018	.21
946	Piazzi 221	52	+15	.025	.29	1055	λ Ophiuchi	27	+ 2	.017	.22
948	β Lupi	53	−43	.054	.45	1059	A Draconis	28	+69	.022	.19
950	δ Libræ	57	− 8	.026	.25	1061	τ Scorpii	31	−28	.021	.25
952	β Boötis	14 59	+41	.020	.22	1062	σ Herculis	16 32	+43	.017	.18
953	γ Scorpii	14 59	−25	.024	.29	1063	ζ Ophiuchi	33	−10	.014	.20
955	ψ Boötis	15 1	+27	.018	.22	1065	24 Scorpii	37	−18	.022	.30
962	Gr. 2283	3	+88	.023	.29	1067	ζ Herculis	38	+32	.016	.17
957	*c* Boötis	4	+25	.030	.33	1069	η Herculis	40	+39	.015	.17
959	ζ Lupi	15 7	−52	.059	.51	1068	α Tri. Aust.	16 40	−69	.036	.29
960	ι Libræ	8	−19	.021	.24	1071	Gr. 2377	44	+57	.038	.45
965	3 Serpentis	11	+ 5	.029	.31	1073	ε Scorpii	45	−34	.040	.33
963	γ Tri. Aust.	11	−68	.044	.36	1078	49 Herculis	48	+15	.024	.29
966	δ Boötis	12	+34	.018	.23	1083	ε^1 Aræ	53	−53	.056	.50
967	β Libræ	15 13	− 9	.013	.17	1084	κ Ophiuchi	16 54	+ 9	.014	.17
976	γ Urs. Min.	21	+72	.018	.16	1087	ε Urs. Min.	54	+82	.018	.16
975	μ Boötis *pr.*	21	+38	.019	.22	1086	30 Ophiuchi	57	− 4	.035	.39
977	τ^1 Serpentis	22	+16	.026	.36	1088	ε Herculis	57	+31	.016	.21
979	ι Draconis	23	+59	.025	.21	1089	*d* Herculis	16 59	+34	.026	.30
978	32 Libræ	15 24	−16	.018	.28	1092	η Ophiuchi	17 6	−16	.016	.17
980	β Cor. Bor.	25	+29	.025	.22	1093	η Scorpii	6	−43	.044	.34
973	ρ Octantis	25	−84	.037	.38	1094	ζ Draconis	9	+66	.020	.19
981	ν^1 Boötis	28	+41	.023	.31	1096	α Herculis	11	+14	.010	.14
984	γ Lupi (*mean*)	30	−41	.043	.35	1098	δ Herculis	12	+25	.020	.24
986	γ Libræ	15 31	−15	.021	.24	1100	π Herculis	17 12	+37	.018	.22
987	α Cor. Bor.	31	+27	.010	.13	1101	59 Apodis (G.)	16	−81	.073	.74
993	ζ Cor. Bor. *seq.*	36	+37	.027	.36	1105	θ Ophiuchi	17	−25	.019	.21
997	α Serpentis	40	+ 7	.010	.13	1106	*w* Herculis	18	+33	.027	.30
998	β Serpentis	42	+16	.018	.21	1107	β Aræ	19	−55	.069	.49
999	κ Serpentis	15 45	+18	.024	.25	1109	*b* Ophiuchi	17 21	−24	.018	.29
1000	μ Serpentis	45	− 3	.019	.35	1111	σ Ophiuchi	23	+ 4	.017	.22
1002	12 H. Draco.	45	+63	.028	.32	1112	δ Aræ	24	−61	....	...
1003	ε Serpentis	47	+ 5	.014	.19	1115	α Aræ	26	−50	.056	.46
1006	ζ Urs. Min.	47	+78	.016	.15	1117	λ Herculis	28	+26	.031	.37
1004	β Tri. Aust.	15 48	−63	.059	.45	1118	λ Scorpii	17 28	−37	.058	.47
1005	λ Libræ	49	−20	.026	.36	1119	β Draconis	29	+52	.014	.15
1009	γ Serpentis	53	+16	.016	.23	1123	α Ophiuchi	31	+13	.010	.14
1010	κ Scorpii	15 54	−26	.023	.29	1125	ξ Serpentis	17 33	−15	.024	.24

MEAN ERRORS OF NEWCOMB'S PLACES FOR 1920 OF STARS OF THE AMERICA EPHEMERIS AND NAUTICAL ALMANAC.

Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.	
				α	δ					α	δ
		h m	°	s	″			h m	°	s	″
1131	ι Herculis	17 37	+46	.018	.17	1240	δ Draconis	19 13	+68	.016	[illegible]
1132	ω Draconis	37	+69	.021	.21	1239	d Sagittarii	13	−19	.014	[illegible]
1129	η Pavonis	38	−65	.067	.58	1241	θ Lyræ	14	+38	.025	[illegible]
1134	β Ophiuchi	40	+ 5	.013	.17	1242	ω Aquilæ	14	+11	.019	[illegible]
1135	ι¹ Scorpii	42	−40	.066	.54	1243	κ Cygni	15	+53	.019	[illegible]
1137	μ Herculis	17 43	+28	.014	.19	1248	τ Draconis	19 17	+73	.019	[illegible]
1140	ψ Draconis	43	+72	.021	.20	1251	δ Aquilæ	21	+ 3	.012	[illegible]
1138	γ Ophiuchi	44	+ 3	.017	.21	1259	β Cygni	27	+28	.014	[illegible]
1146	ξ Draconis	52	+57	.021	.21	1260	ι Cygni	28	+52	.020	[illegible]
1145	89 Herculis	52	+26	.025	.33	1264	μ Aquilæ	30	+ 7	.024	[illegible]
1150	35 Draconis	17 53	+77	.022	.23	1265	h Sagittarii	19 32	−25	.019	[illegible]
1147	θ Herculis	54	+37	.017	.21	1224	σ Octantis	32	−89	.025	[illegible]
1148	ν Ophiuchi	55	−10	.016	.22	1266	κ Aquilæ	33	− 7	.018	[illegible]
1149	ξ Herculis	55	+29	.034	.30	1269	θ Cygni	34	+50	.019	[illegible]
1151	γ Draconis	55	+51	.013	.16	1271	54 Sagittarii	36	−16	.022	[illegible]
1152	67 Ophiuchi	17 57	+ 3	.031	.26	1273	β Sagittæ	19 37	+17	.016	[illegible]
1164	δ Urs. Min.	17 58	+87	....	...	1281	15 Cygni	41	+37	.029	[illegible]
1156	θ Aræ	18 0	−50	.056	.50	1280	f Sagittarii	42	−20	.020	[illegible]
1158	γ Sagittarii	1	−30	.021	.39	1282	γ Aquilæ	42	+10	.009	.15
1159	70 Ophiuchi	1	+ 3	.022	.26	1283	δ Cygni	42	+45	.021	[illegible]
1160	72 Ophiuchi	18 4	+10	.016	.19	1284	δ Sagittæ	19 44	+18	.017	[illegible]
1161	o Herculis	4	+29	.019	.22	1286	α Aquilæ	47	+ 9	.010	.14
1153	χ Octantis	8	−88	.034	.30	1288	η Aquilæ	48	+ 1	.022	[illegible]
1166	μ Sagittarii	9	−21	.016	.19	1290	ε Draconis	48	+70	.024	.19
1169	η Sagittarii	12	−37	.057	.50	1289	ι Sagittarii	50	−42	.073	.62
1170	Gr. 2533	18 13	+42	.035	.40	1291	ε Pavonis	19 51	−73	....	...
1171	36 Draconis	13	+64	.020	.21	1292	β Aquilæ	51	+ 6	.008	.14
1173	δ Sagittarii	15	−30	.020	.25	1297	γ Sagittæ	55	+19	.017	.22
1174	η Serpentis	17	− 3	.016	.17	1299	c Sagittarii	19 58	−28	.017	.24
1175	ε Sagittarii	19	−34	.055	.46	1304	τ Aquilæ	20 0	+ 7	.022	.33
1178	109 Herculis	18 20	+22	.018	.21	1308	θ Aquilæ	20 7	− 1	.013	.18
1179	α Telescopii	21	−46	.049	.41	1314	o Cygni *seq.*	11	+46	.019	.21
1185	χ Draconis	23	+73	.020	.20	1318	κ Cephei	12	+77	.018	.19
1182	λ Sagittarii	23	−25	.017	.22	1319	24 Vulpeculæ	13	+24	.025	.30
1187	c Serpentis	26	− 2	.027	.38	1320	α² Capricorni	14	−13	.012	.17
1189	1 Aquilæ	18 31	− 8	.013	.25	1321	β Capricorni	20 17	−15	.022	.21
1190	ζ Pavonis	34	−71	.016	.40	1324	α Pavonis	19	−57	....	...
1193	α Lyræ	34	+39	.009	.15	1325	γ Cygni	19	+40	.013	.17
1196	2 Aquilæ	38	− 9	.029	.30	1328	π Capricorni	23	−18	.019	.27
1199	φ Sagittarii	41	−27	.022	.26	1329	ρ Capricorni	24	−18	.018	.21
1202	110 Herculis	18 42	+20	.020	.22	1332	41 Cygni	20 26	+30	.029	.35
1204	6 Aquilæ	43	− 5	.020	.32	1336	θ Cephei	28	+63	.018	.17
1206	λ Pavonis	45	−62	.059	.52	1337	ε Delphini	29	+11	.013	.19
1209	β Lyræ	47	+33	.013	.16	1340	Gr. 3241	30	+72	.034	.40
1212	50 Draconis	49	+75	.031	.25	1341	α Indi	32	−48	.046	.37
1213	o Draconis	18 50	+59	.028	.21	1344	β Delphini	20 34	+14	.016	.22
1211	σ Sagittarii	50	−26	.018	.27	1348	υ Capricorni	35	−18	.023	.33
1215	θ Serp. *pr.*	52	+ 4	.017	.25	1349	α Delphini	36	+16	.014	.22
1218	R Lyræ	53	+44	.025	.31	1350	β Pavonis	38	−66	....	...
1220	γ Lyræ	56	+33	.018	.22	1352	α Cygni	39	+45	.010	.12
1219	ε Aquilæ	18 56	+15	.017	.19	1353	δ Delphini	20 40	+15	.019	.24
1222	ζ Sagittarii	58	−30	.042	.37	1354	ψ Capricorni	41	−26	.028	.32
1255	λ Urs. Min.	18 59	+89	....	...	1356	γ Delph. *seq.*	43	+16	.024	.30
1226	ζ Aquilæ	19 2	+14	.014	.15	1357	ε Cygni	43	+34	.014	.21
1227	λ Aquilæ	2	− 5	.014	.23	1358	ε Aquarii	43	−10	.014	.19
1228	α Cor. Aust.	19 4	−38	.050	.42	1361	η Cephei	20 44	+62	.018	.16
1230	ι Lyræ	4	+36	.025	.29	1366	μ Aquarii	48	− 9	.016	.22
1231	π Sagittarii	5	−21	.019	.23	1368	76 Draconis	48	+82	.022	.21
1237	ψ Sagittarii	19 11	−25	.021	.31	1364	β Indi	20 49	−59	.067	.58

EAN ERRORS OF NEWCOMB'S PLACES FOR 1920 OF STARS OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

t. o.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.	
				a	δ					a	δ
		h m	°	s	″			h m	°	s	″
69	32 Vulpeculæ	20 51	+28	.018	.22	1495	10 Lacertæ	22 36	+39	.027	.30
71	220 Draco.(H^1.)	51	+80	.021	.25	1497	ε Pisc. Aust.	36	−27	.028	.38
73	ν Cygni	54	+41	.022	.22	1499	ζ Pegasi	37	+10	.013	.17
72	α Octantis	55	−77	.055	.46	1500	β Gruis	38	−47	.060	.46
74	γ Microscop.	20 56	−33	.037	.49	1498	β Octantis	38	−82	.036	.30
78	θ Capricorni	21 1	−18	.017	.22	1501	η Pegasi	22 39	+30	.017	.21
80	ξ Cygni	2	+44	.018	.20	1504	λ Pegasi	43	+23	.016	.21
81	61 Cygni *pr.*	3	+38	.020	.19	1505	ε Gruis	44	−52	.052	.48
84	ν Aquarii	5	−12	.019	.28	1506	τ Aquarii	45	−14	.018	.24
87	Br. 2777	7	+78	.023	.21	1507	μ Pegasi	46	+24	.016	.19
86	3 Pisc. Aust.	21 9	−28	.032	.46	1510	ι Cephei	22 47	+66	.014	.17
89	ζ Cygni	10	+30	.015	.18	1512	λ Aquarii	48	−8	.013	.19
91	τ Cygni	12	+38	.022	.22	1513	ρ Indi	49	−71	.051	.62
92	α Equulei	12	+5	.015	.20	1514	δ Aquarii	50	−16	.019	.25
94	σ Cygni	14	+39	.021	.28	1516	α Pisc. Aust.	53	−30	.032	.28
96	θ^1 Microscop.	21 16	−41	.074	.80	1520	ο Androm.	22 58	+42	.017	.22
97	α Cephei	17	+62	.016	.14	1523	β Pegasi	23 0	+28	.020	.21
98	ι Capricorni	18	−17	.021	.25	1525	α Pegasi	1	+15	.010	.14
99	1 Pegasi	18	+19	.020	.27	1528	55 Pegasi	3	+9	.029	.40
400	γ Pavonis	20	−66	.061	.43	1531	c^2 Aquarii	5	−22	.023	.32
403	ζ Capricorni	21 22	−23	.024	.31	1533	π Cephei	23 5	+75	.019	.21
406	g Cygni	27	+46	.028	.29	1532	ι Gruis	6	−46	.064	.56
407	β Aquarii	27	−6	.018	.18	1534	59 Pegasi	8	+8	.028	.41
409	β Cephei	28	+70	.014	.14	1535	5 Cassiop.(H^1.)	9	+57	.030	.31
415	ξ Aquarii	33	−8	.016	.22	1536	φ Aquarii	10	−6	.016	.22
416	74 Cygni	21 34	+40	.029	.31	1537	ψ Aquarii	23 12	−10	.020	.29
417	γ Capricorni	36	−17	.018	.26	1539	γ Tucanæ	13	−59	.044	.38
418	λ Octantis	39	−83	.065	.51	1540	γ Piscium	13	+3	.013	.16
424	ε Pegasi	40	+10	.012	.18	1542	γ Sculptoris	15	−33	.053	.46
426	11 Cephei	41	+71	.028	.26	1544	ο Cephei	15	+68	.025	.25
428	δ Capricorni	21 43	−16	.017	.21	1546	τ Pegasi	23 17	+23	.020	.25
431	π^2 Cygni	44	+49	.022	.24	1548	b^1 Aquarii	19	−21	.024	.32
433	μ Capricorni	49	−14	.016	.23	1550	4 Cassiop.	21	+62	.022	.23
434	γ Gruis	49	−38	.064	.52	1549	υ Pegasi	21	+23	.020	.24
435	16 Pegasi	49	+26	.018	.22	1552	κ Piscium	23	+1	.014	.19
439	79 Draconis	21 52	+73	.023	.25	1553	θ Piscium	23 24	+6	.019	.26
444	20 Pegasi	57	+13	.022	.25	1555	70 Pegasi	25	+12	.022	.26
1442	ε Indi	21 57	−57	.058	.80	1559	39 H. Cephei	28	+87	.018	.21
1449	α Aquarii	22 2	−1	.010	.13	1558	β Sculptoris	29	−38	.046	.47
1450	ι Aquarii	2	−14	.020	.22	1561	72 Pegasi	30	+31	.026	.30
1452	20 Cephei	22 3	+62	.029	.29	1567	λ Androm.	23 34	+46	.016	.20
1451	α Gruis	3	−47	....	...	1568	ι Androm.	34	+43	.021	.21
1453	ι Pegasi	3	+25	.019	.21	1569	ι Piscium	36	+5	.013	.19
1456	θ Pegasi	6	+6	.017	.22	1570	γ Cephei	36	+77	.014	.14
1457	π Pegasi	6	+33	.022	.25	1572	κ Androm.	36	+44	.020	.23
1459	ζ Cephei	22 8	+58	.018	.18	1574	ω^2 Aquarii	23 39	−15	.023	.37
1460	24 Cephei	8	+72	.021	.22	1576	i^1 Aquarii	40	−19	.022	.27
1466	θ Aquarii	13	−8	.013	.21	1577	ψ Androm.	42	+46	.023	.39
1467	α Tucanæ	13	−61	.041	.32	1580	41 H. Cephei	44	+67	.024	.27
1469	υ Octantis	17	−86	.026	.22	1581	δ Sculptoris	45	−29	.024	.33
1473	γ Aquarii	22 18	−2	.013	.18	1582	γ^1 Octantis	23 47	−82	.032	.29
1474	31 Pegasi	18	+12	.024	.28	1583	φ Pegasi	48	+19	.023	.31
1477	3 Lacertæ	20	+52	.018	.20	1586	ρ Cassiop.	50	+57	.032	.28
1478	π Aquarii	21	+1	.018	.30	1587	Gr. 4163	51	+74	.032	.37
1483	σ Aquarii	26	−11	.016	.21	1592	ω Piscium	55	+6	.013	.16
1488	α Lacertæ	22 28	+50	.020	.19	1593	ε Tucanæ	23 56	−66	.071	.60
1489	υ Aquarii	30	−21	.026	.33	1595	30 Piscium	58	−6	.022	.28
1491	226 B. Cephei	31	+76	.026	.25	1596	2 Ceti	23 59	−18	.018	.23
1490	η Aquarii	22 31	−1	.013	.19						

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Oct.	12 45	−84 39	Oct.	14 13	−83 17	Oct.	18 5	−87 40	Oct.	19 25	−89 13	Oct.	22 16	−86 2
	s	″		s	″		s	″		s	″		s	″
1.0	42.74	64.05	1.1	5.38	14.71	1.2	32.03	17.43	1.3	99.26	60.76	1.4	19.14	58.7
2.0	42.73	63.77	2.1	5.31	14.46	2.2	31.57	17.41	2.3	97.90	60.84	2.4	18.99	58.9
3.0	42.71	63.48	3.1	5.24	14.21	3.2	31.10	17.40	3.3	96.50	60.93	3.4	18.84	59.2
3.9	42.69	63.18	4.1	5.16	13.96	4.2	30.61	17.38	4.3	95.03	61.02	4.4	18.67	59.51
4.9	42.68	62.86	5.1	5.09	13.68	5.2	30.09	17.35	5.3	93.48	61.10	5.4	18.50	59.79
5.9	42.68	62.54	6.1	5.01	13.38	6.2	29.54	17.31	6.3	91.84	61.18	6.4	18.30	60.06
6.9	42.69	62.20	7.1	4.95	13.06	7.2	28.98	17.23	7.3	90.12	61.22	7.4	18.06	60.33
7.9	42.72	61.85	8.0	4.90	12.72	8.2	28.44	17.14	8.3	88.36	61.25	8.4	17.80	60.58
8.9	42.77	61.51	9.0	4.87	12.39	9.2	27.92	17.01	9.3	86.63	61.23	9.4	17.52	60.80
9.9	42.84	61.18	10.0	4.85	12.05	10.2	27.43	16.86	10.3	84.96	61.20	10.4	17.24	61.00
10.9	42.92	60.88	11.0	4.84	11.74	11.2	26.97	16.71	11.3	83.42	61.14	11.4	16.97	61.17
11.9	43.00	60.61	12.0	4.84	11.45	12.2	26.56	16.56	12.3	81.98	61.10	12.4	16.71	61.33
12.9	43.07	60.36	13.0	4.85	11.18	13.2	26.18	16.42	13.3	80.65	61.05	13.4	16.47	61.49
13.9	43.14	60.11	14.0	4.84	10.92	14.2	25.80	16.31	14.2	79.35	61.03	14.4	16.26	61.64
14.9	43.19	59.86	15.0	4.82	10.67	15.2	25.41	16.22	15.2	78.03	61.02	15.4	16.06	61.82
15.9	43.23	59.60	16.0	4.79	10.41	16.2	24.98	16.13	16.2	76.66	61.02	16.4	15.85	62.02
16.9	43.26	59.32	17.0	4.76	10.14	17.2	24.52	16.05	17.2	75.19	61.06	17.4	15.64	62.24
17.9	43.30	59.02	18.0	4.72	9.84	18.2	24.04	15.96	18.2	73.60	61.06	18.4	15.40	62.46
18.9	43.35	58.70	19.0	4.69	9.52	19.2	23.53	15.83	19.2	71.92	61.05	19.4	15.14	62.69
19.9	43.42	58.37	20.0	4.68	9.18	20.2	23.01	15.68	20.2	70.18	61.00	20.3	14.84	62.91
20.9	43.51	58.03	21.0	4.67	8.84	21.2	22.50	15.50	21.2	68.42	60.95	21.3	14.52	63.11
21.9	43.62	57.70	22.0	4.69	8.48	22.2	22.02	15.30	22.2	66.68	60.86	22.3	14.20	63.27
22.9	43.75	57.39	23.0	4.71	8.13	23.2	21.56	15.09	23.2	65.02	60.76	23.3	13.86	63.43
23.9	43.87	57.09	24.0	4.74	7.81	24.2	21.14	14.88	24.2	63.42	60.65	24.3	13.54	63.56
24.9	44.00	56.82	25.0	4.78	7.49	25.2	20.75	14.66	25.2	61.91	60.53	25.3	13.22	63.67
25.9	44.13	56.55	25.9	4.82	7.19	26.2	20.37	14.45	26.2	60.49	60.41	26.3	12.92	63.78
26.9	44.25	56.31	26.9	4.86	6.90	27.2	20.01	14.26	27.2	59.11	60.31	27.3	12.63	63.90
27.9	44.37	56.08	27.9	4.90	6.63	28.2	19.66	14.07	28.2	57.77	60.20	28.3	12.36	64.00
28.9	44.48	55.84	28.9	4.93	6.36	29.2	19.32	13.89	29.2	56.45	60.11	29.3	12.09	64.13
29.9	44.59	55.60	29.9	4.95	6.09	30.1	18.96	13.72	30.2	55.10	60.03	30.3	11.82	64.20
30.9	44.69	55.35	30.9	4.98	5.81	31.1	18.58	13.55	31.2	53.71	59.95	31.3	11.55	64.39
31.9	44.79	55.08	31.9	4.99	5.52	32.1	18.18	13.37	32.2	52.26	59.86	32.3	11.27	64.53
	10.76	−10.71		8.55	−8.50		24.61	−24.59		74.76	−74.76		15.93	−15.90
	$12^h\ 45^m$	$55^s.22$		$14^h\ 13^m$	$9^s.28$		$18^h\ 5^m$	$0^s.43$		$19^h\ 24^m$	$31^s.66$		$22^h\ 15^m$	$43^s.98$
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.31

[Eph 15]

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			δ Octantis. Mag. 4.1			χ Octantis. Mag. 5.2			σ Octantis. Mag. 5.5			υ Octantis. Mag. 5.7		
ean lar ate.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	° ′
ov.	12 45	−84 39	Nov.	14 13	−83 16	Nov.	18 5	−87 40	Nov.	19 25	−89 13	Nov.	22 16	−86 24
	s	″		s	″		s	″		s	″		s	″
0.9	44.79	55.08	0.9	4.99	65.52	1.1	18.18	13.37	1.2	52.26	59.86	1.3	11.27	4.53
1.9	44.90	54.80	1.9	5.02	65.22	2.1	17.77	13.18	2.2	50.73	59.77	2.3	10.96	4.67
2.9	45.02	54.52	2.9	5.05	64.90	3.1	17.35	12.97	3.2	49.13	59.66	3.3	10.63	4.81
3.9	45.17	54.23	3.9	5.10	64.56	4.1	16.93	12.73	4.2	47.52	59.52	4.3	10.28	4.93
4.9	45.33	53.95	4.9	5.16	64.23	5.1	16.54	12.47	5.2	45.92	59.35	5.3	9.91	5.03
5.9	45.51	53.68	5.9	5.23	63.90	6.1	16.18	12.18	6.2	44.38	59.16	6.3	9.54	5.10
6.9	45.71	53.44	6.9	5.33	63.59	7.1	15.86	11.89	7.2	42.98	58.94	7.3	9.18	5.14
7.9	45.90	53.22	7.9	5.43	63.29	8.1	15.59	11.60	8.2	41.70	58.72	8.3	8.83	5.16
8.9	46.10	53.03	8.9	5.53	63.02	9.1	15.36	11.32	9.2	40.53	58.50	9.3	8.50	5.16
9.9	46.29	52.86	9.9	5.62	62.77	10.1	15.13	11.06	10.2	39.44	58.31	10.3	8.19	5.17
10.9	46.46	52.70	10.9	5.71	62.55	11.1	14.92	10.82	11.2	38.41	58.12	11.3	7.91	5.18
11.9	46.61	52.53	11.9	5.79	62.32	12.1	14.69	10.60	12.2	37.34	57.97	12.3	7.64	5.22
12.9	46.75	52.35	12.9	5.86	62.08	13.1	14.44	10.39	13.2	36.18	57.82	13.3	7.36	5.28
13.9	46.90	52.15	13.9	5.92	61.82	14.1	14.15	10.16	14.2	34.93	57.68	14.3	7.07	5.34
14.9	47.05	51.92	14.9	5.98	61.54	15.1	13.83	9.92	15.2	33.60	57.51	15.3	6.74	5.42
15.9	47.22	51.68	15.9	6.06	61.25	16.1	13.51	9.66	16.2	32.21	57.32	16.3	6.39	5.48
16.9	47.41	51.45	16.9	6.15	60.94	17.1	13.20	9.37	17.2	30.79	57.11	17.3	6.03	5.52
17.9	47.62	51.22	17.9	6.26	60.63	18.1	12.90	9.05	18.2	29.39	56.87	18.3	5.65	5.54
18.9	47.84	51.01	18.9	6.38	60.33	19.1	12.64	8.72	19.1	28.08	56.62	19.3	5.26	5.53
19.9	48.07	50.81	19.9	6.51	60.04	20.1	12.41	8.39	20.1	26.86	56.35	20.3	4.88	5.52
20.9	48.30	50.64	20.9	6.64	59.77	21.1	12.23	8.05	21.1	25.72	56.08	21.3	4.51	5.47
21.9	48.53	50.49	21.9	6.78	59.52	22.1	12.07	7.72	22.1	24.69	55.80	22.3	4.16	5.42
22.9	48.76	50.35	22.9	6.92	59.29	23.1	11.93	7.41	23.1	23.74	55.54	23.3	3.82	5.36
23.9	48.97	50.22	23.9	7.05	59.07	24.1	11.80	7.11	24.1	22.85	55.28	24.3	3.50	5.29
24.9	49.18	50.10	24.9	7.18	58.86	25.1	11.67	6.82	25.1	21.97	55.03	25.3	3.19	5.24
25.9	49.39	49.98	25.9	7.31	58.65	26.1	11.55	6.55	26.1	21.11	54.80	26.2	2.90	5.19
26.9	49.58	49.86	26.9	7.42	58.45	27.1	11.42	6.28	27.1	20.23	54.58	27.2	2.61	5.15
27.8	49.78	49.73	27.9	7.54	58.24	28.1	11.26	6.01	28.1	19.30	54.35	28.2	2.31	5.12
28.8	49.98	49.59	28.9	7.65	58.02	29.1	11.10	5.73	29.1	18.32	54.12	29.2	2.00	5.09
29.8	50.19	49.44	29.9	7.77	57.78	30.1	10.92	5.43	30.1	17.28	53.88	30.2	1.66	5.07
30.8	50.41	49.29	30.9	7.91	57.54	31.1	10.75	5.11	31.1	16.21	53.61	31.2	1.31	5.02
31.8	50.65	49.14	31.9	8.05	57.29	32.1	10.60	4.77	32.1	15.16	53.33	32.2	0.94	4.96
	10.75	−10.71		8.55	−8.49		24.59	−24.57		74.67	−74.66		15.93	−15.90
	$12^h\ 45^m$	$55^s.22$		$14^h\ 13^m$	$9^s.28$		$18^h\ 5^m$	$0^s.43$		$19^h\ 24^m$	$31^s.66$		$22^h\ 15^m$	$43^s.98$
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.31

APPARENT PLACES OF CIRCUMPOLAR STARS

FOR THE UPPER TRANSIT AT WASHINGTON.

ι Octantis. Mag. 5.4			**δ Octantis.** Mag. 4.1			**χ Octantis.** Mag. 5.2			**σ Octantis.** Mag. 5.5			**υ Octantis.** Mag. 5.7		
Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*	Mean Solar Date.	Right Ascension.	Declination *South.*
	h m	° ′		h m	° ′		h m	° ′		h m	° ′		h m	°
Dec.	12 45	−84 39	Dec.	14 13	−83 16	Dec.	18 5	−87 39	Dec.	19 25	−89 13	Dec.	22 15	−86 2
	s	″		s	″		s	″		s	″		s	″
0.8	50.41	49.29	0.9	7.91	57.54	1.1	10.75	65.11	1.1	16.21	53.61	1.2	61.31	65.0
1.8	50.65	49.14	1.9	8.05	57.29	2.1	10.60	64.77	2.1	15.16	53.33	2.2	60.94	64.9
2.8	50.91	49.00	2.9	8.21	57.04	3.1	10.48	64.41	3.1	14.18	53.00	3.2	60.56	64.87
3.8	51.18	48.89	3.9	8.39	56.81	4.1	10.40	64.03	4.1	13.30	52.66	4.2	60.19	64.75
4.8	51.46	48.80	4.9	8.58	56.59	5.0	10.37	63.66	5.1	12.56	52.30	5.2	59.83	64.59
5.8	51.73	48.75	5.9	8.77	56.41	6.0	10.39	63.29	6.1	11.97	51.97	6.2	59.50	64.43
6.8	51.99	48.72	6.9	8.96	56.26	7.0	10.44	62.95	7.1	11.50	51.63	7.2	59.20	64.25
7.8	52.23	48.71	7.9	9.14	56.13	8.0	10.50	62.63	8.1	11.10	51.32	8.2	58.92	64.0
8.8	52.47	48.69	8.9	9.31	56.00	9.0	10.55	62.34	9.1	10.71	51.03	9.2	58.66	63.93
9.8	52.69	48.66	9.9	9.46	55.88	10.0	10.58	62.06	10.1	10.27	50.76	10.2	58.41	63.80
10.8	52.90	48.62	10.9	9.61	55.74	11.0	10.57	61.78	11.1	9.74	50.48	11.2	58.14	63.69
11.8	53.12	48.56	11.9	9.75	55.59	12.0	10.54	61.49	12.1	9.13	50.21	12.2	57.85	63.59
12.8	53.35	48.49	12.9	9.91	55.41	13.0	10.51	61.18	13.1	8.45	49.93	13.2	57.55	63.48
13.8	53.59	48.42	13.9	10.07	55.22	14.0	10.46	60.85	14.1	7.73	49.62	14.2	57.22	63.36
14.8	53.85	48.35	14.9	10.25	55.03	15.0	10.44	60.49	15.1	7.04	49.28	15.2	56.88	63.22
15.8	54.13	48.29	15.9	10.45	54.85	16.0	10.45	60.11	16.1	6.41	48.92	16.2	56.53	63.04
16.8	54.41	48.25	16.9	10.65	54.67	17.0	10.50	59.72	17.1	5.87	48.56	17.2	56.19	62.85
17.8	54.70	48.23	17.9	10.86	54.52	18.0	10.58	59.34	18.1	5.44	48.19	18.2	55.86	62.65
18.8	54.99	48.24	18.9	11.07	54.39	19.0	10.70	58.97	19.1	5.12	47.81	19.2	55.55	62.43
19.8	55.27	48.26	19.9	11.28	54.28	20.0	10.84	58.62	20.1	4.89	47.44	20.2	55.26	62.20
20.8	55.53	48.30	20.8	11.48	54.19	21.0	11.00	58.29	21.1	4.73	47.10	21.2	55.00	61.97
21.8	55.79	48.35	21.8	11.68	54.11	22.0	11.16	57.96	22.1	4.62	46.75	22.2	54.75	61.70
22.8	56.04	48.40	22.8	11.88	54.04	23.0	11.32	57.65	23.1	4.53	46.44	23.2	54.51	61.54
23.8	56.28	48.45	23.8	12.07	53.97	23.9	11.48	57.36	24.1	4.45	46.13	24.2	54.28	61.33
24.8	56.51	48.48	24.8	12.25	53.90	24.9	11.62	57.07	25.1	4.33	45.82	25.2	54.04	61.14
25.8	56.74	48.51	25.8	12.42	53.83	25.9	11.75	56.78	26.0	4.16	45.51	26.2	53.80	60.95
26.8	56.98	48.54	26.8	12.60	53.74	26.9	11.87	56.48	27.0	3.95	45.20	27.2	53.55	60.70
27.8	57.22	48.55	27.8	12.79	53.64	27.9	11.98	56.16	28.0	3.69	44.87	28.2	53.28	60.50
28.8	57.49	48.57	28.8	12.99	53.53	28.9	12.11	55.81	29.0	3.44	44.52	29.2	52.99	60.34
29.8	57.77	48.60	29.8	13.20	53.43	29.9	12.26	55.45	30.0	3.23	44.15	30.2	52.70	60.10
30.8	58.06	48.64	30.8	13.42	53.33	30.9	12.45	55.07	31.0	3.12	43.76	31.2	52.41	59.85
31.8	58.35	48.72	31.8	13.66	53.26	31.9	12.68	54.70	32.0	3.15	43.37	32.1	52.13	59.54
	10.75	−10.70		8.55	−8.49		24.56	−24.54		74.45	−74.44		15.93	−15.00
	$12^h\ 45^m$	$55^s.22$		$14^h\ 13^m$	$9^s.28$		$18^h\ 5^m$	$0^s.43$		$19^h\ 24^m$	$31^s.66$		$22^h\ 15^m$	$43^s.98$
	−84° 39′	43″.10		−83° 16′	47″.50		−87° 39′	52″.55		−89° 13′	43″.28		−86° 24′	3″.31

AN ERRORS OF NEWCOMB'S PLACES FOR 1920 OF STARS OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

t.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.	
					α	δ						α	δ
		h	m	°	s	"			h	m	°	s	"
1	33 Piscium	0	1	− 6	.018	.25	109	ε Sculpt.	1	42	−25	.037	.46
3	α Androm.		4	+29	.010	.13	116	ζ Ceti		48	−11	.020	.24
4	β Cassiop.		5	+59	.017	.17	118	α Trianguli		49	+29	.022	.22
5	ε Phœnicis		5	−46	.051	.41	117	ε Cassiop.		49	+63	.017	.17
6	22 Androm.		6	+46	.024	.28	120	ξ Piscium		49	+ 3	.018	.23
0	γ Pegasi	0	9	+15	.011	.14	121	β Arietis	1	50	+20	.013	.20
4	σ Androm.		14	+36	.029	.33	122	ψ Phœnicis		50	−47	.080	.81
5	ι Ceti		15	− 9	.014	.20	127	υ Ceti		56	−21	.025	.32
6	ζ Tucanæ		16	−65	.047	.38	129	α Hydri		56	−62	.049	.34
9	44 Piscium		21	+ 1	.018	.22	126	50 Cassiop.		57	+72	.016	.17
0	β Hydri	0	22	−78	....	...	131	γ Andr. *pr.*	1	59	+42	.016	.16
1	α Phœnicis		22	−43	.047	.31	133	α Arietis	2	3	+23	.010	.14
3	12 Ceti		26	− 4	.017	.21	134	β Trianguli		5	+35	.018	.21
0	13 Ceti		31	− 4	.023	.30	136	55 Cassiop.		8	+66	.025	.24
1	ζ Cassiop.		33	+53	.021	.20	137	6 Persei		8	+51	.025	.27
32	π Androm.	0	33	+33	.021	.21	138	ξ¹ Ceti	2	9	+ 8	.018	.23
35	ε Androm.		34	+29	.016	.19	139	μ Fornacis		9	−31	.076	.83
36	δ Androm.		35	+30	.018	.22	141	γ Trianguli		13	+33	.024	.31
37	α Cassiop.		36	+56	.012	.14	142	67 Ceti		13	− 7	.021	.25
38	μ Phœnicis		38	−47	....	.53	144	φ Eridani		14	−52	.049	.42
39	β Ceti	0	40	−18	.013	.17	145	ο Ceti	2	15	− 3	.018	.23
42	ο Cassiop.		40	+48	.034	.26	146	κ Fornacis		19	−24	.049	.47
41	21 Cassiop.		40	+75	.017	.24	148	δ Hydri		20	−69	....	...
45	ζ Androm.		43	+24	.019	.24	149	ι Cassiop.		22	+67	.025	.25
46	η Cassiop.		44	+57	.017	.24	153	ξ² Ceti		24	+ 8	.014	.19
49	δ Piscium	0	45	+ 7	.014	.20	156	σ Ceti	2	28	−16	.028	.37
52	λ Hydri		46	−75	....	.70	157	36 H. Cassiop.		30	+72	.021	.22
53	20 Ceti		49	− 2	.018	.26	160	ν Ceti		32	+ 5	.020	.26
54	γ Cassiop.		52	+60	.018	.22	163	μ Hydri		33	−79	.056	.70
55	μ Androm.		52	+38	.017	.21	161	ν Arietis		34	+22	.020	.26
58	α Sculptoris	0	55	−30	.025	.23	165	δ Ceti	2	35	− 0	.014	.20
59	43 H. Cephei		58	+86	.010	.17	172	ε Hydri		38	−69	....	...
61	ε Piscium	0	59	+ 7	.012	.26	170	6 Persei		39	+49	.021	.19
66	β Phœnicis	1	3	−47	.050	.47	173	γ Ceti *seq.*		39	+ 3	.016	.20
65	μ Cassiop.		3	+55	.022	.27	174	π Ceti		40	−14	.025	.25
69	η Ceti	1	5	−11	.025	.22	175	μ Ceti	2	41	+10	.020	.21
71	β Androm.		5	+35	.013	.17	177	η Persei		45	+56	.010	.25
74	τ Piscium		7	+30	.019	.33	178	41 Arietis		45	+27	.020	.22
76	ζ Piscium		10	+ 7	.019	.24	179	β Fornacis		46	−33	.050	.47
78	κ Tucanæ		13	−69	....	...	180	σ Arietis		47	+15	.018	.24
79	*f* Piscium	1	14	+ 3	.022	.29	181	τ² Eridani	2	47	−21	.022	.32
80	υ Piscium		15	+27	.022	.25	182	τ Persei		49	+52	.020	.19
85	θ Ceti		20	− 9	.013	.19	183	η Eridani		53	− 9	.016	.21
86	δ Cassiop.		21	+60	.018	.19	185	ε Arietis		55	+21	.016	.23
91	γ Phœnicis		25	−44	.044	.35	187	θ Eridani		55	−41	.056	.42
90	38 Cassiop.	1	25	+70	.026	.28	184	47 H. Cephei	2	55	+79	.035	.32
94	η Piscium		27	+15	.020	.19	189	α Ceti		58	+ 4	.010	.13
89	α Urs. Min.		32	+89	....	...	191	τ³ Eridani		59	−24	.029	.32
96	40 Cassiop.		32	+73	.028	.25	190	γ Persei	2	59	+53	.029	.20
97	υ Androm.		32	+41	.024	.26	192	ρ Persei	3	0	+39	.019	.24
98	π Piscium	1	33	+12	.022	.25	194	μ Horologii	3	2	−60	.060	.49
99	υ Persei		33	+48	.018	.19	197	θ Hydri		2	−72	.046	.47
101	α Eridani		35	−58	....	...	195	β Persei		3	+41	.016	.20
103	ω Cassiop.		36	+68	.025	.25	199	δ Arietis		7	+19	.014	.17
104	ν Piscium		37	+ 5	.014	.20	202	12 Eridani		9	−29	.022	.30
105	φ Persei	1	39	+50	.022	.20	200	48 H. Cephei	3	10	+77	.032	.32
107	τ Ceti		40	−16	.020	.25	203	ζ Arietis		10	+21	.018	.29
108	ο Piscium		41	+ 9	.013	.19	204	38 Horologii(G.)		11	−58	....	...
112	4 Octantis(G.)	1	42	−85	.039	.40	206	ζ Eridani	3	12	− 9	.022	.31

MEAN ERRORS OF NEWCOMB'S PLACES FOR 1920 OF STARS OF THE AMERICA EPHEMERIS AND NAUTICAL ALMANAC.

Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Err 192	
					α	δ						α	
		h	m	°	s	″			h	m	°	s	
209	τ Arietis	3	17	+21	.027	.32	319	η Aurigæ	5	1	+41	.021	
210	e Eridani		17	−43	.056	.49	320	ε Leporis		2	−22	.021	
212	ι Hydri		18	−78	....	...	322	β Eridani		4	− 5	.016	
211	α Persei		19	+50	.013	.14	327	μ Aurigæ		8	+38	.028	
213	ο Tauri		21	+ 9	.014	.21	328	μ Leporis		9	−16	.032	
214	2 H. Camel.	3	23	+60	.028	.37	326	19 H.Camel.	5	9	+79	.025	
215	ξ Tauri		23	+ 9	.023	.22	330	β Orionis		11	− 8	.009	
219	f Tauri		26	+13	.016	.22	329	α Aurigæ		11	+46	.012	
221	ε Eridani		29	−10	.014	.17	332	λ Aurigæ		14	+40	.027	
222	τ^5 Eridani		30	−22	.031	.40	333	τ Orionis		14	− 7	.014	
230	δ Persei	3	37	+48	.016	.16	335	ο Columbæ	5	15	−35	.068	
235	δ Eridani		39	−10	.020	.24	342	γ Orionis		21	+ 6	.017	
234	ν Persei		40	+42	.024	.25	343	β Tauri		21	+29	.010	
237	5 H. Camel.		42	+71	.025	.29	344	17 Camelop.		23	+63	.029	
238	η Tauri		43	+24	.014	.17	347	β Leporis		25	−21	.025	
239	τ^6 Eridani	3	43	−23	.023	.30	348	χ Aurigæ	5	28	+32	.022	
243	g Eridani		46	−36	.073	.63	350	δ Orionis		28	− 0	.012	
246	γ Hydri		48	−74	.031	.29	349	Gr. 966		29	+75	.022	
244	ζ Persei		49	+32	.019	.22	354	α Leporis		29	−18	.018	
245	9 H. Camel.		50	+61	.031	.33	355	ϕ^1 Orionis		30	+ 9	.021	
248	ε Persei	3	52	+40	.019	.22	359	ι Orionis	5	32	− 6	.022	
250	ξ Persei		54	+36	.019	.22	361	ε Orionis		32	− 1	.013	
251	γ Eridani		54	−14	.017	.19	362	ζ Tauri		33	+21	.019	
252	λ Tauri		56	+12	.018	.22	356	Gr. 944		36	+85	.030	
254	δ Reticuli		57	−62	.044	.36	366	ζ Orionis		37	− 2	.016	
255	ν Tauri	3	59	+ 6	.018	.22	368	α Columbæ	5	37	−34	.024	
256	A Tauri	4	0	+22	.020	.23	369	ο Aurigæ		40	+50	.028	
260	c Persei		3	+47	.020	.22	372	ζ Leporis		43	−15	.023	
263	p Tauri		6	+26	.030	.37	373	κ Orionis		44	−10	.013	
265	o^1 Eridani		8	− 7	.016	.23	375	δ Doradus		45	−66	....	..
264	Gr. 750	4	11	+85	.017	.24	381	31 Mensæ (G.)	5	46	−85	.042	
268	μ Tauri		11	+ 9	.027	.47	374	ν Aurigæ		46	+39	.021	
270	α Horologii		11	−42	.073	.69	378	δ Leporis		48	−21	.036	
271	α Reticuli		13	−63	.061	.54	382	α Orionis		51	+ 7	.008	
274	γ Tauri		15	+15	.013	.21	385	η Leporis		53	−14	.022	
277	δ Tauri	4	18	+17	.017	.23	383	δ Aurigæ	5	53	+54	.026	
279	υ^5 Eridani		21	−34	.046	.42	387	β Aurigæ		54	+45	.016	
284	δ Mensæ		23	−80	.058	.52	388	θ Aurigæ		54	+37	.020	
281	ε Tauri		24	+19	.013	.20	393	1 Gemin.	5	59	+23	.021	
285	m Persei		28	+43	.031	.34	395	1 Puppis (G.)	6	2	−45	.057	
288	α Tauri	4	31	+16	.009	.13	396	ν Orionis	6	3	+15	.016	
291	α Doradus		32	−55	.054	.40	402	22 H.Camel.		10	+69	.022	
289	ν Eridani		32	− 4	.018	.24	405	η Gemin.		10	+23	.014	
292	53 Eridani		35	−14	.023	.28	406	2 Lyncis		13	+59	.023	
296	τ Tauri		37	+23	.014	.23	411	ζ Can. Maj.		17	−30	.055	
297	α Cœli	4	38	−42	.050	.46	412	μ Gemin.	6	18	+23	.013	
294	Gr. 848		38	+76	.024	.30	413	ψ^1 Aurigæ		19	+49	.025	
298	4 Camelop.		41	+57	.027	.25	414	β Can. Maj.		19	−18	.019	
299	μ Eridani		42	− 3	.016	.21	415	8 Monoc.		20	+ 5	.022	
303	π^3 Orionis		45	+ 7	.021	.22	416	α Argûs		22	−53	....	..
302	9 Camelop.	4	46	+66	.021	.19	418	10 Monoc.	6	24	− 5	.017	
304	i Tauri		47	+19	.023	.31	419	ν Gemin.		24	+20	.027	
307	π^5 Orionis		50	+ 2	.016	.22	423	8 Lyncis		30	+62	.022	
309	ι Aurigæ		52	+33	.014	.17	425	ξ^2 Can. Maj.		32	−23	.034	
313	ε Aurigæ		56	+44	.021	.19	424	23 H.Camel.		33	+80	.024	
312	β Camelop.	4	56	+60	.023	.19	427	γ Gemin.	6	33	+16	.013	
314	ζ Aurigæ		57	+41	.017	.22	426	51 Aurigæ		33	+39	.025	
316	ι Tauri	4	58	+21	.019	.26	429	ν Argûs		35	−43	.058	
318	11 Orionis	5	0	+15	.020	.35	430	S Monoc.	6	37	+10	.016	

EAN ERRORS OF NEWCOMB'S PLACES FOR 1920 OF STARS OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

t. o.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.		Decl. 1920.	Mean Error 1920.	
					a	δ						a	δ
		h	m	°	s	″			h	m	°	s	″
1	ε Gemin.	6	39	+25	.014	.19	536	30 Monoc.	8	22	− 4	.017	.23
3	ξ Gemin.		41	+13	.013	.21	539	θ Chamæl.		23	−77	.050	.40
2	ψ^5 Aurigæ		41	+44	.029	.24	537	ο Urs. Maj.		24	+61	.014	.15
4	α Can. Maj.		42	−17	....	.16	543	Gr. 1450		28	+38	.047	.43
5	18 Monoc.		44	+ 3	.020	.25	544	η Cancri		28	+21	.019	.20
6	43 Camelop.	6	45	+69	.027	.24	545	Gr. 1446	8	31	+74	.032	.38
3	ζ Mensæ		47	−81	.048	.47	547	δ Hydræ		33	+ 6	.019	.26
1	α Pictoris		47	−62	.061	.63	548	σ Hydræ		35	+ 4	.023	.27
0	θ Gemin.		48	+34	.020	.22	554	γ Cancri		39	+22	.016	.21
2	τ Argûs		48	−51	.069	.64	556	δ Cancri		40	+18	.017	.21
4	15 Lyncis	6	50	+59	.023	.21	557	α Pyxidis	8	40	−33	.053	.42
6	θ Can. Maj.		50	−12	.021	.31	558	ι Cancri		42	+29	.025	.26
1	ε Can. Maj.		55	−29	.017	.23	560	δ Argûs		42	−54	.053	.41
4	ζ Gemin.	6	59	+21	.016	.19	559	ε Hydræ		43	+ 7	.014	.19
5	o^2 Can. Maj.	7	0	−24	.025	.29	566	σ^2 Cancri		49	+31	.022	.31
6	γ Can. Maj.	7	0	−16	.021	.28	567	ζ Hydræ	8	51	+ 6	.018	.24
9	51 H. Cephei		4	+87	....	...	569	ι Urs. Maj.		54	+48	.016	.17
0	δ Can. Maj.		5	−26	.020	.24	571	α Cancri		54	+12	.015	.20
1	63 Aurigæ		6	+39	.021	.26	574	b^1 Carinæ		55	−59	.044	.43
4	51 Gemin.		9	+16	.023	.37	576	κ Urs. Maj.	8	58	+47	.018	.19
5	γ^2 Volantis	7	9	−70	.071	.64	582	σ^2 Urs. Maj.	9	3	+67	.020	.28
9	λ Gemin.		13	+17	.013	.22	583	κ Cancri		3	+11	.016	.22
70	π Argûs		14	−37	.046	.34	585	λ Argûs		5	−43	.039	.32
7	25 H. Camel.		14	+83	.025	.24	590	ζ Octantis		9	−85	.041	.38
80	7 Octant. (G.)		15	−87	.053	.46	589	θ Hydræ		10	+ 3	.014	.19
71	δ Gemin.	7	15	+22	.014	.17	591	β Argûs	9	12	−69	.035	.28
74	δ Volantis		17	−68	.061	.64	593	83 Cancri		15	+18	.018	.24
76	ι Gemin.		21	+28	.014	.22	594	ι Argûs		15	−59	....	...
77	η Can. Maj.		21	−29	.021	.25	595	40 Lyncis		16	+35	.018	.21
78	Gr. 1308		23	+69	.028	.26	596	θ Pyxidis		18	−26	.046	.61
79	β Can. Min.	7	23	+ 8	.014	.19	599	α Hydræ	9	24	− 8	.010	.15
81	ρ Gemin.		24	+32	.021	.27	601	h Urs. Maj.		25	+63	.019	.19
83	σ Argûs		27	−43	.060	.46	600	1 H. Draco.		26	+82	.016	.20
84	α^2 Gemin		29	+32	.019	.14	603	d Urs. Maj.		27	+70	.025	.24
88	25 Monoc.		33	− 4	.040	.42	604	θ Urs. Maj.		28	+52	.017	.17
92	α Can. Min.	7	35	+ 5	....	.15	606	ψ Argûs	9	28	−40	.056	.51
93	24 Lyncis		36	+59	.033	.29	605	ξ Leonis		28	+12	.024	.30
95	κ Gemin.		40	+25	.018	.22	607	10 Leo. Min.		29	+37	.020	.27
96	β Gemin.		40	+28	.010	.12	620	ζ Chamæl.		36	−81	.047	.48
99	4 Puppis		42	−14	.028	.36	619	ο Leonis		37	+10	.014	.16
02	ξ Argûs	7	46	−25	.021	.27	622	θ Antliæ	9	41	−27	.057	.49
05	φ Gemin.		49	+27	.018	.28	623	ε Leonis		41	+24	.014	.17
06	26 Lyncis		49	+48	.022	.30	627	υ Argûs		45	−65	.049	.38
07	Gr. 1374		51	+74	.029	.32	626	υ Urs. Maj.		45	+59	.013	.17
14	χ Argûs		55	−53	.052	.40	629	6 Sextantis		47	− 4	.030	.35
15	ω Cancri	7	56	+26	.022	.30	630	μ Leonis	9	48	+26	.014	.19
17	χ Gemin.	7	59	+28	.018	.24	632	Gr. 1586		51	+73	.026	.32
20	27 Lyncis	8	2	+52	.022	.23	634	19 Leo. Min.		53	+41	.022	.24
23	ρ Argûs		4	−24	.018	.24	636	φ Argûs		54	−54	.045	.37
22	3 H. Ur. Maj.		5	+69	.025	.29	638	π Leonis	9	56	+ 8	.012	.20
25	γ Argûs	8	7	−47	.051	.44	641	η Leonis	10	3	+17	.022	.22
26	ζ Cancri		8	+18	.022	.25	642	α Leonis		4	+12	.015	.13
27	Br. 1147		10	+76	.026	.31	644	λ Hydræ		7	−12	.019	.24
28	20 Puppis		10	−16	.023	.32	645	q Velorum		11	−42	.088	.76
29	β Cancri		12	+ 9	.013	.24	646	32 Urs. Maj.		12	+66	.024	.25
33	31 Lyncis	8	17	+43	.027	.22	648	ζ Leonis	10	12	+24	.018	.22
18	Gr. 1119		19	+89	.025	...	647	λ Urs. Maj.		12	+43	.017	.16
34	d^1 Cancri		19	+19	.022	.29	653	γ Leonis *pr.*		16	+20	.019	.15
35	ε Argûs	8	21	−59	.038	.33	657	μ Urs. Maj.	10	18	+42	.016	.19

MEAN ERRORS OF NEWCOMB'S PLACES FOR 1920 OF STARS OF THE AMERICA EPHEMERIS AND NAUTICAL ALMANAC.

Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920. α	Mean Error 1920. δ	Cat. No.	Name	R. A. 1920.	Decl. 1920.	Mean Err α	Mean Err δ
		h m	°	s	″			h m	°	s	′
658	30 H. Ur. Maj.	10 18	+66	.031	.27	770	β Chamæl.	12 14	−79	.037	.3
659	30 H. Camel.	21	+83	.026	.30	772	Br. 1672	14	+88	.016	[illegible]
661	μ Hydræ	22	−16	.018	.22	773	η Virginis	16	− 0	.013	.1
662	31 Leo. Min.	23	+37	.019	.24	780	α¹ Crucis	22	−63	....	..
664	α Antliæ	23	−31	.044	.35	787	20 Comæ	26	+21	.034	.3
666	36 Urs. Maj.	10 26	+56	.022	.25	786	δ Corvi	12 26	−16	.018	[illegible]
668	9 H. Draco.	28	+76	.019	.21	789	γ Crucis	27	−57	.084	.3
669	ρ Leonis	29	+10	.016	.21	791	8 Can. Ven.	30	+42	.022	[illegible]
679	33 Sextantis	37	− 1	.024	.31	793	κ Draconis	30	+70	.018	.1
683	41 Leo. Min.	39	+24	.022	.26	792	β Corvi	30	−23	.019	.2
684	θ Argûs	10 40	−64	.052	.41	795	24 Comæ *seq.*	12 31	+19	.025	.3
685	42 Leo. Min.	41	+31	.019	.28	796	α Muscæ	32	−69	.063	.5
687	η Argûs	42	−59	....	...	799	χ Virginis	35	− 8	.024	.3
688	μ Argûs	43	−49	.049	.37	800	γ Centauri	37	−49	.041	.3
691	δ² Chamæl.	45	−80	.047	.39	801	γ Virginis	38	− 1	.018	[illegible]
689	l Leonis	10 45	+11	.015	.20	802	ρ Virginis	12 38	+11	.023	.2
690	ν Hydræ	46	−16	.022	.24	803	76 Urs. Maj.	38	+63	.034	.2
692	46 Leo. Min.	49	+35	.019	.21	808	β Crucis	43	−59	.034	.2
694	54 Leonis	51	+25	.027	.35	810	ι Octantis	46	−85	.046	.37
696	ι Antliæ	53	−37	.072	.95	812	31 Comæ	48	+28	.024	.27
695	Gr. 1706	10 54	+78	.034	.40	814	32 H. Camel.	12 49	+84	.021	.23
698	α Crateris	56	−18	.020	.25	813	n Centauri	49	−40	.068	.6
699	d Leonis	56	+ 4	.018	.24	816	ε Urs. Maj.	51	+56	.017	.1
701	β Urs. Maj.	57	+57	.017	.16	817	δ Virginis	52	+ 4	.013	.17
702	α Urs. Maj.	10 59	+62	.016	.15	818	α Can. Ven.	52	+39	.014	.17
704	η Octantis	11 0	−84	.044	.42	820	δ Muscæ	12 57	−71	.017	.33
703	χ Leonis	1	+ 8	.013	.19	821	ε Virginis	12 58	+11	.013	.17
706	p⁴ Leonis	3	+ 2	.022	.25	827	θ Virginis	13 6	− 5	.014	.17
708	ψ Urs. Maj.	5	+45	.016	.17	830	43 Comæ	8	+28	.019	.25
710	β Crateris	8	−22	.021	.33	836	20 Can.Ven.	14	+41	.024	.24
712	δ Leonis	11 10	+21	.014	.16	838	γ Hydræ	13 15	−23	.022	.35
713	θ Leonis	10	+16	.019	.21	839	ι Centauri	16	−36	.056	.43
718	ν Urs. Maj.	14	+34	.021	.21	842	ζ¹ Urs. Maj.	21	+55	.020	.1
719	δ Crateris	15	−14	.017	.19	843	α Virginis	21	−11	.008	.14
720	σ Leonis	17	+ 6	.014	.19	846	Gr. 2001	24	+73	.026	.31
721	π Centauri	11 17	−54	....	...	845	70 Virginis	13 25	+14	.025	.31
723	ι Leonis	20	+11	.018	.21	847	κ Octantis	28	−85	.039	.35
727	τ Leonis	24	+ 3	.016	.21	852	ζ Virginis	31	− 0	.010	.17
730	λ Draconis	27	+70	.016	.16	854	17 H.Can.Ven.	31	+38	.041	.42
731	ξ Hydræ	29	−31	.050	.39	857	ε Centauri	35	−53	.039	.34
733	λ Centauri	11 32	−63	.053	.48	859	m Virginis	13 37	− 8	.015	.22
734	υ Leonis	33	− 0	.016	.18	863	τ Boötis	43	+18	.018	.19
735	π Chamæl.	34	−75	.079	.80	866	η Urs. Maj.	44	+50	.012	.14
737	3 Draconis	38	+67	.025	.25	867	89 Virginis	46	−18	.027	.35
738	ζ Crateris	41	−18	.019	.29	871	ζ Centauri	51	−47	.042	.33
740	χ Urs. Maj.	11 42	+48	.016	.17	872	η Boötis	13 51	+19	.012	.17
744	β Leonis	45	+15	.010	.14	878	θ Apodis	57	−76	....	...
745	β Virginis	47	+ 2	.012	.14	880	11 Boötis	58	+28	.023	.26
747	Gr. 1830	48	+38	.037	.32	879	τ Virginis	58	+ 2	.013	.18
748	γ Urs. Maj.	50	+54	.012	.14	881	β Centauri	13 58	−60	....	...
753	π Virginis	11 57	+ 7	.016	.21	882	π Hydræ	14 2	−26	.021	.36
758	o Virginis	12 1	+ 9	.016	.15	883	θ Centauri	2	−36	.044	.33
760	δ Centauri	4	−50	.067	.46	885	α Draconis	2	+65	.016	.17
762	ε Corvi	6	−22	.020	.23	888	d Boötis	7	+25	.023	.38
763	4 H. Draco.	8	+78	.017	.19	889	κ Virginis	9	−10	.013	.21
765	δ Crucis	12 11	−58	.058	.45	890	4 Urs. Min.	14 9	+78	.018	.24
766	δ Urs. Maj.	11	+57	.020	.17	891	ι Virginis	12	− 6	.017	.21
767	γ Corvi	12	−17	.019	.20	893	α Boötis	12	+20	.008	.13
68	ι Can. Ven.	12 12	+41	.032	.32	894	λ Boötis	14 13	+46	.019	.21

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at. o.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.	
				α	δ					α	δ
		h m	°	s	″			h m	°	s	″
92	δ Octantis	14 14	−83	.035	.30	1011	ε Cor. Bor.	15 54	+27	.023	.24
98	λ Virginis	15	−13	.017	.24	1012	δ Scorpii	15 56	−22	.020	.26
901	2 Libræ	19	−11	.025	.33	1019	θ Draconis	16 0	+59	.018	.17
904	θ Boötis	22	+52	.018	.17	1017	β Scorpii	1	−20	.014	.17
905	*f* Boötis	23	+20	.021	.26	1021	κ Herculis	4	+17	.028	.33
907	φ Virginis	14 24	− 2	.018	.25	1027	Gr. 2320	16 6	+68	.032	.35
911	5 Urs. Min.	28	+76	.019	.21	1026	φ Herculis	6	+45	.025	.22
910	ρ Boötis	28	+31	.016	.19	1023	δ^1 Apodis	8	−78	.053	.49
912	γ Boötis	29	+39	.017	.21	1030	δ Ophiuchi	10	− 3	.012	.17
914	η Centauri	30	−42	.045	.37	1031	σ Cor. Bor. *seq.*	12	+34	.037	.42
915	σ Boötis	14 31	+30	.025	.32	1034	19 Urs. Min.	16 13	+76	.029	.23
917	α^2 Centauri	34	−61	....	...	1032	γ^2 Normæ	14	−50	.049	.38
919	33 Boötis	36	+45	.034	.33	1033	ε Ophiuchi	14	− 4	.014	.22
921	α Apodis	38	−79	.044	.47	1035	σ Scorpii	16	−25	.019	.28
926	μ Virginis	39	− 5	.014	.21	1036	τ Herculis	17	+47	.022	.20
930	ε Boötis	14 41	+27	.016	.16	1039	γ Herculis	16 18	+19	.016	.21
932	109 Virginis	42	+ 2	.018	.22	1045	η Urs. Min.	20	+76	.022	.22
934	8 Libræ	46	−16	.018	.20	1041	γ Apodis	21	−79	.033	.38
936	α Libræ	46	−16	.010	.14	1046	ω Herculis	22	+14	.030	.37
941	Gr. 2164	49	+60	.033	.35	1050	η Draconis	23	+62	.018	.17
944	β Urs. Min.	14 51	+74	.016	.16	1051	α Scorpii	16 24	−26	.013	.21
945	ξ^2 Libræ	52	−11	.018	.23	1056	β Herculis	27	+22	.018	.21
946	Piazzi 221	52	+15	.025	.29	1055	λ Ophiuchi	27	+ 2	.017	.22
948	β Lupi	53	−43	.054	.45	1059	A Draconis	28	+69	.022	.19
950	δ Libræ	57	− 8	.026	.25	1061	τ Scorpii	31	−28	.021	.25
952	β Boötis	14 59	+41	.020	.22	1062	σ Herculis	16 32	+43	.017	.18
953	γ Scorpii	14 59	−25	.024	.29	1063	ζ Ophiuchi	33	−10	.014	.20
955	ψ Boötis	15 1	+27	.018	.22	1065	24 Scorpii	37	−18	.022	.30
962	Gr. 2283	3	+88	.023	.29	1067	ζ Herculis	38	+32	.016	.17
957	*c* Boötis	4	+25	.030	.33	1069	η Herculis	40	+39	.015	.17
959	ζ Lupi	15 7	−52	.059	.51	1068	α Tri. Aust.	16 40	−69	.036	.29
960	ι Libræ	8	−19	.021	.24	1071	Gr. 2377	44	+57	.038	.45
965	3 Serpentis	11	+ 5	.029	.31	1073	ε Scorpii	45	−34	.040	.33
963	γ Tri. Aust.	11	−68	.044	.36	1078	49 Herculis	48	+15	.024	.29
966	δ Boötis	12	+34	.018	.23	1083	ε^1 Aræ	53	−53	.056	.50
967	β Libræ	15 13	− 9	.013	.17	1084	κ Ophiuchi	16 54	+ 9	.014	.17
976	γ Urs. Min.	21	+72	.018	.16	1087	ε Urs. Min.	54	+82	.018	.16
975	μ Boötis *pr.*	21	+38	.019	.22	1086	30 Ophiuchi	57	− 4	.035	.39
977	τ^1 Serpentis	22	+16	.026	.36	1088	ε Herculis	57	+31	.016	.21
979	ι Draconis	23	+59	.025	.21	1089	*d* Herculis	16 59	+34	.026	.30
978	32 Libræ	15 24	−16	.018	.28	1092	η Ophiuchi	17 6	−16	.016	.17
980	β Cor. Bor.	25	+29	.025	.22	1093	η Scorpii	6	−43	.044	.34
973	ρ Octantis	25	−84	.037	.38	1094	ζ Draconis	9	+66	.020	.19
981	ν^1 Boötis	28	+41	.023	.31	1096	α Herculis	11	+14	.010	.14
984	γ Lupi (*mean*)	30	−41	.043	.35	1098	δ Herculis	12	+25	.020	.24
986	γ Libræ	15 31	−15	.021	.24	1100	π Herculis	17 12	+37	.018	.22
987	α Cor. Bor.	31	+27	.010	.13	1101	59 Apodis (G.)	16	−81	.073	.74
993	ζ Cor. Bor. *seq.*	36	+37	.027	.36	1105	θ Ophiuchi	17	−25	.019	.21
997	α Serpentis	40	+ 7	.010	.13	1106	*w* Herculis	18	+33	.027	.30
998	β Serpentis	42	+16	.018	.21	1107	β Aræ	19	−55	.069	.49
999	κ Serpentis	15 45	+18	.024	.25	1109	*b* Ophiuchi	17 21	−24	.018	.29
1000	μ Serpentis	45	− 3	.019	.35	1111	σ Ophiuchi	23	+ 4	.017	.22
1002	12 H. Draco.	45	+63	.028	.32	1112	δ Aræ	24	−61	....	...
1003	ε Serpentis	47	+ 5	.014	.19	1115	α Aræ	26	−50	.056	.46
1006	ζ Urs. Min.	47	+78	.016	.15	1117	λ Herculis	28	+26	.031	.37
1004	β Tri. Aust.	15 48	−63	.059	.45	1118	λ Scorpii	17 28	−37	.058	.47
1005	λ Libræ	49	−20	.026	.36	1119	β Draconis	29	+52	.014	.15
1009	γ Serpentis	53	+16	.016	.23	1123	α Ophiuchi	31	+13	.010	.14
1010	π Scorpii	15 54	−26	.023	.29	1125	ξ Serpentis	17 33	−15	.024	.24

MEAN ERRORS OF NEWCOMB'S PLACES FOR 1920 OF STARS OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920. α	Mean Error 1920. δ	Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920. α	Mean Error 1920. δ
		h m	°	s	″			h m	°	s	″
1131	ι Herculis	17 37	+46	.018	.17	1240	δ Draconis	19 13	+68	.016	.16
1132	ω Draconis	37	+69	.021	.21	1239	d Sagittarii	13	−19	.014	.29
1129	η Pavonis	38	−65	.067	.58	1241	θ Lyræ	14	+38	.025	.34
1134	β Ophiuchi	40	+ 5	.013	.17	1242	ω Aquilæ	14	+11	.019	.21
1135	ι^1 Scorpii	42	−40	.066	.54	1243	κ Cygni	15	+53	.019	.19
1137	μ Herculis	17 43	+28	.014	.19	1248	τ Draconis	19 17	+73	.019	.20
1140	ψ Draconis	43	+72	.021	.20	1251	δ Aquilæ	21	+ 3	.012	.17
1138	γ Ophiuchi	44	+ 3	.017	.21	1259	β Cygni	27	+28	.014	.22
1146	ξ Draconis	52	+57	.021	.21	1260	ι Cygni	28	+52	.020	.19
1145	89 Herculis	52	+26	.025	.33	1264	μ Aquilæ	30	+ 7	.024	.28
1150	35 Draconis	17 53	+77	.022	.23	1265	h Sagittarii	19 32	−25	.019	.26
1147	θ Herculis	54	+37	.017	.21	1224	σ Octantis	32	−89	.025	.22
1148	ν Ophiuchi	55	−10	.016	.22	1266	κ Aquilæ	33	− 7	.018	.28
1149	ξ Herculis	55	+29	.034	.30	1269	θ Cygni	34	+50	.019	.21
1151	γ Draconis	55	+51	.013	.16	1271	54 Sagittarii	36	−16	.022	.30
1152	67 Ophiuchi	17 57	+ 3	.031	.26	1273	β Sagittæ	19 37	+17	.016	.26
1164	δ Urs. Min.	17 58	+87	....	...	1281	15 Cygni	41	+37	.029	.29
1156	θ Aræ	18 0	−50	.056	.50	1280	f Sagittarii	42	−20	.020	.38
1158	γ Sagittarii	1	−30	.021	.39	1282	γ Aquilæ	42	+10	.009	.15
1159	70 Ophiuchi	1	+ 3	.022	.26	1283	δ Cygni	42	+45	.021	.18
1160	72 Ophiuchi	18 4	+10	.016	.19	1284	δ Sagittæ	19 44	+18	.017	.23
1161	o Herculis	4	+29	.019	.22	1286	α Aquilæ	47	+ 9	.010	.14
1153	χ Octantis	8	−88	.034	.30	1288	η Aquilæ	48	+ 1	.022	.20
1166	μ Sagittarii	9	−21	.016	.19	1290	ε Draconis	48	+70	.024	.19
1169	η Sagittarii	12	−37	.057	.50	1289	ι Sagittarii	50	−42	.073	.60
1170	Gr. 2533	18 13	+42	.035	.40	1291	ε Pavonis	19 51	−73	....	...
1171	36 Draconis	13	+64	.020	.21	1292	β Aquilæ	51	+ 6	.008	.14
1173	δ Sagittarii	15	−30	.020	.25	1297	γ Sagittæ	55	+19	.017	.22
1174	η Serpentis	17	− 3	.016	.17	1299	c Sagittarii	19 58	−28	.017	.24
1175	ε Sagittarii	19	−34	.055	.46	1304	τ Aquilæ	20 0	+ 7	.022	.33
1178	109 Herculis	18 20	+22	.018	.21	1308	θ Aquilæ	20 7	− 1	.013	.18
1179	α Telescopii	21	−46	.049	.41	1314	o Cygni *seq.*	11	+46	.019	.21
1185	χ Draconis	23	+73	.020	.20	1318	κ Cephei	12	+77	.018	.19
1182	λ Sagittarii	23	−25	.017	.22	1319	24 Vulpeculæ	13	+24	.025	.30
1187	c Serpentis	26	− 2	.027	.38	1320	α^2 Capricorni	14	−13	.012	.17
1189	1 Aquilæ	18 31	− 8	.013	.25	1321	β Capricorni	20 17	−15	.022	.21
1190	ζ Pavonis	34	−71	.016	.40	1324	α Pavonis	19	−57	....	...
1193	α Lyræ	34	+39	.009	.15	1325	γ Cygni	19	+40	.013	.17
1196	2 Aquilæ	38	− 9	.029	.30	1328	π Capricorni	23	−18	.019	.27
1199	φ Sagittarii	41	−27	.022	.26	1329	ρ Capricorni	24	−18	.018	.21
1202	110 Herculis	18 42	+20	.020	.22	1332	41 Cygni	20 26	+30	.029	.35
1204	6 Aquilæ	43	− 5	.020	.32	1336	θ Cephei	28	+63	.018	.17
1206	λ Pavonis	45	−62	.059	.52	1337	ε Delphini	29	+11	.013	.19
1209	β Lyræ	47	+33	.013	.16	1340	Gr. 3241	30	+72	.034	.40
1212	50 Draconis	49	+75	.031	.25	1341	α Indi	32	−48	.046	.37
1213	o Draconis	18 50	+59	.028	.21	1344	β Delphini	20 34	+14	.016	.22
1211	σ Sagittarii	50	−26	.018	.27	1348	υ Capricorni	35	−18	.023	.33
1215	θ Serp. *pr.*	52	+ 4	.017	.25	1349	α Delphini	36	+16	.014	.22
1218	R Lyræ	53	+44	.025	.31	1350	β Pavonis	38	−66	....	...
1220	γ Lyræ	56	+33	.018	.22	1352	α Cygni	39	+45	.010	.12
1219	ε Aquilæ	18 56	+15	.017	.19	1353	δ Delphini	20 40	+15	.019	.24
1222	ζ Sagittarii	58	−30	.042	.37	1354	ψ Capricorni	41	−26	.028	.32
1255	λ Urs. Min.	18 59	+89	....	...	1356	γ Delph. *seq.*	43	+16	.024	.30
1226	ζ Aquilæ	19 2	+14	.014	.15	1357	ε Cygni	43	+34	.014	.21
1227	λ Aquilæ	2	− 5	.014	.23	1358	ε Aquarii	43	−10	.014	.19
1228	α Cor. Aust.	19 4	−38	.050	.42	1361	η Cephei	20 44	+62	.018	.16
1230	ι Lyræ	4	+36	.025	.29	1366	μ Aquarii	48	− 9	.016	.22
1231	π Sagittarii	5	−21	.019	.23	1368	76 Draconis	48	+82	.022	.21
1237	ψ Sagittarii	19 11	−25	.021	.31	1364	β Indi	20 49	−59	.067	.58

EAN ERRORS OF NEWCOMB'S PLACES FOR 1920 OF STARS OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

t.).	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.	
				α	δ					α	δ
		h m	°	s	"			h m	°	s	"
69	32 Vulpeculæ	20 51	+28	.018	.22	1495	10 Lacertæ	22 36	+39	.027	.30
71	220 Draco.(H^1.)	51	+80	.021	.25	1497	ε Pisc. Aust.	36	−27	.028	.38
73	ν Cygni	54	+41	.022	.22	1499	ζ Pegasi	37	+10	.013	.17
72	α Octantis	55	−77	.055	.46	1500	β Gruis	38	−47	.060	.46
74	γ Microscop.	20 56	−33	.037	.49	1498	β Octantis	38	−82	.036	.30
78	θ Capricorni	21 1	−18	.017	.22	1501	η Pegasi	22 39	+30	.017	.21
80	ξ Cygni	2	+44	.018	.20	1504	λ Pegasi	43	+23	.016	.21
81	61 Cygni *pr.*	3	+38	.020	.19	1505	ε Gruis	44	−52	.052	.48
84	ν Aquarii	5	−12	.019	.28	1506	τ Aquarii	45	−14	.018	.24
87	Br. 2777	7	+78	.023	.21	1507	μ Pegasi	46	+24	.016	.19
86	3 Pisc. Aust.	21 9	−28	.032	.46	1510	ι Cephei	22 47	+66	.014	.17
89	ζ Cygni	10	+30	.015	.18	1512	λ Aquarii	48	− 8	.013	.19
91	τ Cygni	12	+38	.022	.22	1513	ρ Indi	49	−71	.051	.62
92	α Equulei	12	+ 5	.015	.20	1514	δ Aquarii	50	−16	.019	.25
94	σ Cygni	14	+39	.021	.28	1516	α Pisc. Aust.	53	−30	.032	.28
96	θ^1 Microscop.	21 16	−41	.074	.80	1520	ο Androm.	22 58	+42	.017	.22
97	α Cephei	17	+62	.016	.14	1523	β Pegasi	23 0	+28	.020	.21
98	ι Capricorni	18	−17	.021	.25	1525	α Pegasi	1	+15	.010	.14
99	1 Pegasi	18	+19	.020	.27	1528	55 Pegasi	3	+ 9	.029	.40
00	γ Pavonis	20	−66	.061	.43	1531	c^2 Aquarii	5	−22	.023	.32
03	ζ Capricorni	21 22	−23	.024	.31	1533	π Cephei	23 5	+75	.019	.21
06	*g* Cygni	27	+46	.028	.29	1532	ι Gruis	6	−46	.064	.56
07	β Aquarii	27	− 6	.018	.18	1534	59 Pegasi	8	+ 8	.028	.41
09	β Cephei	28	+70	.014	.14	1535	5 Cassiop.(H^1.)	9	+57	.030	.31
415	ξ Aquarii	33	− 8	.016	.22	1536	φ Aquarii	10	− 6	.016	.22
416	74 Cygni	21 34	+40	.029	.31	1537	ψ Aquarii	23 12	−10	.020	.29
417	γ Capricorni	36	−17	.018	.26	1539	γ Tucanæ	13	−59	.044	.38
418	λ Octantis	39	−83	.065	.51	1540	γ Piscium	13	+ 3	.013	.16
424	ε Pegasi	40	+10	.012	.18	1542	γ Sculptoris	15	−33	.053	.46
426	11 Cephei	41	+71	.028	.26	1544	ο Cephei	15	+68	.025	.25
428	δ Capricorni	21 43	−16	.017	.21	1546	τ Pegasi	23 17	+23	.020	.25
431	π^2 Cygni	44	+49	.022	.24	1548	b^1 Aquarii	19	−21	.024	.32
433	μ Capricorni	49	−14	.016	.23	1550	4 Cassiop.	21	+62	.022	.23
434	γ Gruis	49	−38	.064	.52	1549	υ Pegasi	21	+23	.020	.24
435	16 Pegasi	49	+26	.018	.22	1552	κ Piscium	23	+ 1	.014	.19
439	79 Draconis	21 52	+73	.023	.25	1553	θ Piscium	23 24	+ 6	.019	.26
444	20 Pegasi	57	+13	.022	.25	1555	70 Pegasi	25	+12	.022	.26
442	ε Indi	21 57	−57	.058	.80	1559	39 H. Cephei	28	+87	.018	.21
449	α Aquarii	22 2	− 1	.010	.13	1558	β Sculptoris	29	−38	.046	.47
450	ι Aquarii	2	−14	.020	.22	1561	72 Pegasi	30	+31	.026	.30
452	20 Cephei	22 3	+62	.029	.29	1567	λ Androm.	23 34	+46	.016	.20
451	α Gruis	3	−47	. . . .	. . .	1568	ι Androm.	34	+43	.021	.21
453	ι Pegasi	3	+25	.019	.21	1569	ι Piscium	36	+ 5	.013	.19
456	θ Pegasi	6	+ 6	.017	.22	1570	γ Cephei	36	+77	.014	.14
457	π Pegasi	6	+33	.022	.25	1572	κ Androm.	36	+44	.020	.23
459	ζ Cephei	22 8	+58	.018	.18	1574	ω^2 Aquarii	23 39	−15	.023	.37
460	24 Cephei	8	+72	.021	.22	1576	i^1 Aquarii	40	−19	.022	.27
1466	θ Aquarii	13	− 8	.013	.21	1577	ψ Androm.	42	+46	.023	.39
1467	α Tucanæ	13	−61	.041	.32	1580	41 H. Cephei	44	+67	.024	.27
1469	υ Octantis	17	−86	.026	.22	1581	δ Sculptoris	45	−29	.024	.33
1473	γ Aquarii	22 18	− 2	.013	.18	1582	γ^1 Octantis	23 47	−82	.032	.29
1474	31 Pegasi	18	+12	.024	.28	1583	φ Pegasi	48	+19	.023	.31
1477	3 Lacertæ	20	+52	.018	.20	1586	ρ Cassiop.	50	+57	.032	.28
1478	π Aquarii	21	+ 1	.018	.30	1587	Gr. 4163	51	+74	.032	.37
1483	σ Aquarii	26	−11	.016	.21	1592	ω Piscium	55	+ 6	.013	.16
1488	α Lacertæ	22 28	+50	.020	.19	1593	ε Tucanæ	23 56	−66	.071	.60
1489	υ Aquarii	30	−21	.026	.33	1595	30 Piscium	58	− 6	.022	.28
1491	226 B. Cephei	31	+76	.026	.25	1596	2 Ceti	23 59	−18	.018	.23
1490	η Aquarii	22 31	− 1	.013	.19						

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Jan. 1	18 44 28.76	29.40	−23 3 30.2	29.5	11.042	+11.71	+ 3 24.99	16 17.90	1 11.07	18 41 3.85
2	18 48 53.62	54.34	22 58 34.9	34.0	11.029	12.87	3 53.29	16 17.90	1 11.03	18 45 0.41
3	18 53 18.15	18.95	22 53 12.2	11.1	11.015	14.02	4 21.26	16 17.90	1 10.98	18 48 56.97
4	18 57 42.32	43.21	22 47 22.2	20.9	10.999	15.15	4 48.88	16 17.89	1 10.93	18 52 53.53
5	19 2 6.10	7.07	22 41 5.0	3.7	10.983	16.28	5 16.11	16 17.88	1 10.87	18 56 50.09
6	19 6 29.48	30.52	−22 34 20.8	19.3	10.965	+17.40	+ 5 42.94	16 17.86	1 10.81	19 0 46.65
7	19 10 52.43	53.54	22 27 9.8	7.9	10.947	18.51	6 9.33	16 17.83	1 10.75	19 4 43.21
8	19 15 14.92	16.11	22 19 32.3	30.1	10.927	19.62	6 35.25	16 17.80	1 10.68	19 8 39.77
9	19 19 36.92	38.19	22 11 28.3	25.9	10.905	20.71	7 0.71	16 17.76	1 10.61	19 12 36.32
10	19 23 58.40	59.75	22 2 58.2	55.4	10.884	21.80	7 25.64	16 17.72	1 10.54	19 16 32.88
11	19 28 19.35	20.77	−21 53 62.1	59.1	10.861	+22.87	+ 7 50.04	16 17.68	1 10.46	19 20 29.44
12	19 32 39.74	41.23	21 44 40.4	37.1	10.837	23.94	8 13.88	16 17.63	1 10.38	19 24 26.00
13	19 36 59.55	61.09	21 34 53.2	49.6	10.812	24.99	8 37.12	16 17.57	1 10.30	19 28 22.56
14	19 41 18.73	20.34	21 24 41.0	37.0	10.786	26.03	8 59.75	16 17.51	1 10.21	19 32 19.12
15	19 45 37.28	38.95	21 13 63.9	59.6	10.759	27.06	9 21.74	16 17.45	1 10.12	19 36 15.67
16	19 49 55.15	56.89	−21 2 62.4	57.8	10.731	+28.07	+ 9 43.06	16 17.37	1 10.03	19 40 12.23
17	19 54 12.34	14.14	20 51 36.7	31.8	10.702	29.07	10 3.69	16 17.30	1 9.93	19 44 8.79
18	19 58 28.82	30.67	20 39 47.2	42.0	10.672	30.05	10 23.61	16 17.23	1 9.83	19 48 5.35
19	20 2 44.57	46.47	20 27 34.2	28.7	10.641	31.02	10 42.80	16 17.16	1 9.73	19 52 1.91
20	20 6 59.57	61.52	20 14 58.2	52.3	10.609	31.98	11 1.24	16 17.08	1 9.63	19 55 58.46
21	20 11 13.81	15.80	−20 1 59.3	53.2	10.577	+32.92	+11 18.92	16 17.00	1 9.53	19 59 55.02
22	20 15 27.28	29.31	19 48 38.1	31.6	10.545	33.84	11 35.83	16 16.91	1 9.43	20 3 51.58
23	20 19 39.95	42.03	19 34 54.8	48.0	10.512	34.75	11 51.94	16 16.82	1 9.33	20 7 48.14
24	20 23 51.83	53.95	19 20 49.9	42.7	10.478	35.65	12 7.27	16 16.72	1 9.22	20 11 44.70
25	20 28 2.91	5.06	19 6 23.7	16.2	10.445	36.53	12 21.78	16 16.61	1 9.11	20 15 41.25
26	20 32 13.18	15.36	−18 51 36.6	28.7	10.411	+37.39	+12 35.47	16 16.50	1 9.00	20 19 37.81
27	20 36 22.63	24.84	18 36 28.8	20.7	10.377	38.24	12 48.38	16 16.38	1 8.89	20 23 34.37
28	20 40 31.26	33.50	18 20 61.0	52.5	10.343	39.07	13 0.45	16 16.26	1 8.78	20 27 30.93
29	20 44 39.07	41.34	18 5 13.4	4.6	10.308	39.89	13 11.69	16 16.14	1 8.66	20 31 27.48
30	20 48 46.06	48.35	17 48 66.4	57.4	10.274	40.69	13 22.12	16 16.01	1 8.54	20 35 24.04
31	20 52 52.22	54.53	−17 32 40.4	31.0	10.240	+41.48	+13 31.72	16 15.87	1 8.42	20 39 20.59
Feb. 1	20 56 57.57	59.90	17 15 55.6	46.0	10.206	42.25	13 40.50	16 15.73	1 8.30	20 43 17.15
2	21 1 2.11	4.45	16 58 52.6	42.7	10.172	43.00	13 48.48	16 15.58	1 8.19	20 47 13.70
3	21 5 5.84	8.19	16 41 31.7	21.5	10.139	43.74	13 55.64	16 15.43	1 8.07	20 51 10.26
4	21 9 8.76	11.13	16 23 53.3	42.9	10.105	44.46	14 2.00	16 15.27	1 7.96	20 55 6.82
5	21 13 10.88	13.26	−16 5 57.8	47.2	10.072	+45.16	+14 7.56	16 15.10	1 7.84	20 59 3.38
6	21 17 12.21	14.59	15 47 45.5	34.6	10.039	45.85	14 12.33	16 14.93	1 7.72	21 2 59.93
7	21 21 12.76	15.14	15 29 16.8	5.7	10.006	46.53	14 16.30	16 14.76	1 7.61	21 6 56.49
8	21 25 12.51	14.90	15 10 32.3	21.0	9.974	47.18	14 19.50	16 14.58	1 7.50	21 10 53.04
9	21 29 11.49	13.87	14 51 32.2	20.8	9.941	47.82	14 21.91	16 14.40	1 7.39	21 14 40.60
10	21 33 9.70	12.07	−14 32 17.0	5.5	9.909	+48.44	+14 23.55	16 14.22	1 7.28	21 18 46.16
11	21 37 7.13	9.50	14 12 47.2	35.5	9.877	49.04	14 24.43	16 14.03	1 7.17	21 22 42.71
12	21 41 3.80	6.17	13 52 63.2	51.3	9.845	49.63	14 24.53	16 13.84	1 7.06	21 26 30.27
13	21 44 59.71	62.07	13 32 65.3	53.3	9.814	50.19	14 23.88	16 13.65	1 6.95	21 30 35.82
14	21 48 54.87	57.21	13 12 54.2	42.0	9.783	50.73	14 22.48	16 13.46	1 6.84	21 34 32.38
15	21 52 49.28	51.61	−12 52 30.2	17.9	9.752	+51.26	+14 20.32	16 13.27	1 6.74	21 38 28.93
16	21 56 42.95	45.27	−12 31 53.7	41.4	9.721	+51.77	+14 17.43	16 13.08	1 6.63	21 42 25.40

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

ate.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
b.16	21 56 42.95	45.27	−12 31 53.7	41.4	9.721	+51.77	+14 17.43	16 13.08	1 6.63	21 42 25.49
17	22 0 35.89	38.19	12 10 65.3	52.9	9.691	52.26	14 13.81	16 12.88	1 6.53	21 46 22.04
18	22 4 28.11	30.39	11 49 65.2	52.8	9.661	52.74	14 9.47	16 12.67	1 6.43	21 50 18.60
19	22 8 19.62	21.88	11 28 54.1	41.6	9.632	53.19	14 4.42	16 12.46	1 6.33	21 54 15.15
20	22 12 10.44	12.67	11 7 32.2	19.7	9.603	53.63	13 58.67	16 12.25	1 6.23	21 58 11.71
21	22 16 0.57	2.78	−10 45 60.1	47.6	9.575	+54.05	+13 52.24	16 12.04	1 6.13	22 2 8.26
22	22 19 50.03	52.22	10 24 18.1	5.6	9.547	54.45	13 45.14	16 11.83	1 6.04	22 6 4.82
23	22 23 38.84	41.00	10 2 26.6	14.2	9.520	54.84	13 37.39	16 11.61	1 5.95	22 10 1.37
24	22 27 27.01	29.15	9 40 26.1	13.7	9.494	55.21	13 29.01	16 11.39	1 5.86	22 13 57.93
25	22 31 14.56	16.67	9 18 17.0	4.6	9.469	55.56	13 20.00	16 11.16	1 5.77	22 17 54.48
26	22 35 1.51	3.58	− 8 55 59.6	47.3	9.444	+55.89	+13 10.39	16 10.94	1 5.69	22 21 51.04
27	22 38 47.88	49.92	8 33 34.3	22.1	9.420	56.21	13 0.20	16 10.71	1 5.61	22 25 47.59
28	22 42 33.68	35.69	8 10 61.5	49.4	9.397	56.52	12 49.44	16 10.48	1 5.53	22 29 44.14
r. 1	22 46 18.94	20.92	7 48 21.5	9.6	9.375	56.81	12 38.14	16 10.24	1 5.46	22 33 40.70
2	22 50 3.68	5.62	7 25 34.8	23.0	9.354	57.08	12 26.33	16 10.00	1 5.39	22 37 37.25
3	22 53 47.93	49.83	− 7 2 41.8	30.0	9.334	+57.34	+12 14.01	16 9.75	1 5.32	22 41 33.81
4	22 57 31.70	33.56	6 39 42.7	31.1	9.314	57.58	12 1.22	16 9.50	1 5.25	22 45 30.36
5	23 1 15.02	16.84	6 16 37.9	26.5	9.295	57.81	11 47.99	16 9.25	1 5.18	22 49 26.92
6	23 4 57.90	59.69	5 53 27.8	16.6	9.278	58.02	11 34.32	16 8.99	1 5.12	22 53 23.47
7	23 8 40.38	42.12	5 30 12.7	1.7	9.262	58.23	11 20.24	16 8.73	1 5.06	22 57 20.02
8	23 12 22.47	24.17	− 5 6 53.0	42.3	9.246	+58.41	+11 5.78	16 8.47	1 5.00	23 1 16.58
9	23 16 4.19	5.86	4 43 29.3	18.7	9.231	58.57	10 50.95	16 8.21	1 4.94	23 5 13.13
10	23 19 45.56	47.19	4 19 61.7	51.4	9.217	58.72	10 35.77	16 7.95	1 4.88	23 9 9.68
11	23 23 26.60	28.19	3 56 30.7	20.6	9.203	58.86	10 20.25	16 7.68	1 4.83	23 13 6.24
12	23 27 7.32	8.87	3 32 56.8	46.8	9.190	58.97	10 4.42	16 7.41	1 4.78	23 17 2.79
13	23 30 47.75	49.25	− 3 9 20.2	10.5	9.178	+59.07	+ 9 48.30	16 7.13	1 4.73	23 20 59.34
14	23 34 27.90	29.36	2 45 41.4	32.0	9.167	59.16	9 31.90	16 6.87	1 4.69	23 24 55.90
15	23 38 7.79	9.20	2 21 60.9	51.8	9.157	59.22	9 15.23	16 6.60	1 4.65	23 28 52.45
16	23 41 47.43	48.80	1 58 19.1	10.2	9.147	59.27	8 58.32	16 6.34	1 4.62	23 32 49.01
17	23 45 26.84	28.17	1 34 36.2	27.6	9.138	59.30	8 41.18	16 6.07	1 4.59	23 36 45.56
18	23 49 6.04	7.32	− 1 10 52.7	44.4	9.129	+59.32	+ 8 23.83	16 5.80	1 4.56	23 40 42.11
19	23 52 45.04	46.28	0 47 9.1	1.1	9.121	59.32	8 6.28	16 5.54	1 4.54	23 44 38.67
20	23 56 23.88	25.06	− 0 23 25.6	17.9	9.114	59.30	7 48.56	16 5.27	1 4.52	23 48 35.22
21	0 0 2.55	3.69	+ 0 0 17.3	24.7	9.108	59.27	7 30.69	16 5.00	1 4.50	23 52 31.77
22	0 3 41.09	42.18	0 23 59.2	66.4	9.103	59.22	7 12.67	16 4.73	1 4.48	23 56 28.33
23	0 7 19.51	20.56	+ 0 47 39.9	46.8	9.099	+59.16	+ 6 54.54	16 4.46	1 4.47	0 0 24.88
24	0 10 57.83	58.83	1 11 18.9	25.5	9.095	59.09	6 36.31	16 4.19	1 4.46	0 4 21.44
25	0 14 36.07	37.02	1 34 56.0	62.2	9.092	59.00	6 18.00	16 3.92	1 4.45	0 8 17.99
26	0 18 14.25	15.15	1 58 30.7	36.6	9.090	58.89	5 59.63	16 3.65	1 4.44	0 12 14.54
27	0 21 52.40	53.25	2 22 2.6	8.2	9.089	58.77	5 41.23	16 3.37	1 4.44	0 16 11.10
28	0 25 30.53	31.34	+ 2 45 31.5	36.8	9.089	+58.64	+ 5 22.80	16 3.10	1 4.44	0 20 7.65
29	0 29 8.66	9.43	3 8 57.0	62.0	9.090	58.49	5 4.39	16 2.83	1 4.44	0 24 4.20
30	0 32 46.83	47.55	3 32 18.9	23.5	9.091	58.33	4 46.01	16 2.55	1 4.45	0 28 0.76
31	0 36 25.05	25.73	3 55 36.7	41.0	9.094	58.16	4 27.69	16 2.27	1 4.46	0 31 57.31
pr. 1	0 40 3.35	3.98	4 18 50.2	54.2	9.098	57.97	4 9.43	16 1.99	1 4.47	0 35 53.86
2	0 43 41.76	42.34	+ 4 41 59.1	62.8	9.103	+57.77	+ 3 51.29	16 1.71	1 4.49	0 39 50.42
3	0 47 20.29	20.82	+ 5 5 3.1	6.5	9.108	+57.56	+ 3 33.27	16 1.43	1 4.51	0 43 46.97

Note.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Apr. 1	0 40 3.35	3.98	+ 4 18 50.2	54.2	9.098	+57.97	+4 9.43	16 1.99	1 4.47	0 35 53.86
2	0 43 41.76	42.34	4 41 59.1	62.8	9.103	57.77	3 51.29	16 1.71	1 4.49	0 39 50.42
3	0 47 20.29	20.82	5 5 3.1	6.5	9.108	57.56	3 33.27	16 1.43	1 4.51	0 43 46.97
4	0 50 58.97	59.46	5 28 1.7	4.9	9.114	57.33	3 15.40	16 1.15	1 4.53	0 47 43.53
5	0 54 37.81	38.26	5 50 54.8	57.6	9.122	57.09	2 57.69	16 0.87	1 4.55	0 51 40.08
6	0 58 16.85	17.25	+ 6 13 41.9	44.4	9.131	+56.83	+ 2 40.19	16 0.59	1 4.58	0 55 36.63
7	1 1 56.10	56.46	6 36 22.7	24.9	9.140	56.56	2 22.88	16 0.30	1 4.61	0 59 33.19
8	1 5 35.57	35.89	6 58 56.9	58.8	9.150	56.28	2 5.80	16 0.02	1 4.64	1 3 29.74
9	1 9 15.28	15.56	7 21 24.0	25.7	9.160	55.98	1 48.96	15 59.74	1 4.68	1 7 26.29
10	1 12 55.26	55.49	7 43 43.8	45.2	9.171	55.66	1 32.39	15 59.46	1 4.72	1 11 22.85
11	1 16 35.50	35.70	+ 8 5 55.9	57.0	9.183	+55.33	+1 16.09	15 59.18	1 4.76	1 15 19.40
12	1 20 16.04	16.19	8 27 59.8	60.7	9.195	54.99	1 0.07	15 58.91	1 4.80	1 19 15.96
13	1 23 56.88	56.99	8 49 55.3	56.0	9.208	54.63	0 44.36	15 58.64	1 4.84	1 23 12.51
14	1 27 38.03	38.11	9 11 42.0	42.4	9.222	54.25	0 28.96	15 58.37	1 4.89	1 27 9.06
15	1 31 19.51	19.55	9 33 19.4	19.6	9.236	53.86	+0 13.89	15 58.10	1 4.94	1 31 5.62
16	1 35 1.33	1.33	+ 9 54 47.3	47.3	9.250	+53.46	−0 0.84	15 57.83	1 4.99	1 35 2.17
17	1 38 43.51	43.47	10 16 5.2	5.1	9.265	53.04	0 15.22	15 57.56	1 5.04	1 38 58.73
18	1 42 26.05	25.97	10 37 13.0	12.7	9.280	52.61	0 29.23	15 57.30	1 5.10	1 42 55.28
19	1 46 8.96	8.85	10 58 10.2	9.7	9.296	52.16	0 42.87	15 57.04	1 5.16	1 46 51.84
20	1 49 52.26	52.12	11 18 56.5	55.7	9.312	51.70	0 56.12	15 56.79	1 5.22	1 50 48.39
21	1 53 35.96	35.79	+11 39 31.5	30.5	9.329	+51.22	−1 8.98	15 56.54	1 5.28	1 54 44.95
22	1 57 20.08	19.87	11 59 54.9	53.7	9.347	50.73	1 21.41	15 56.29	1 5.34	1 58 41.50
23	2 1 4.62	4.38	12 20 6.3	5.0	9.365	50.23	1 33.42	15 56.04	1 5.40	2 2 38.06
24	2 4 49.60	49.33	12 40 5.5	4.0	9.383	49.71	1 45.00	15 55.79	1 5.47	2 6 34.61
25	2 8 35.02	34.72	12 59 52.1	50.5	9.402	49.18	1 56.13	15 55.54	1 5.54	2 10 31.17
26	2 12 20.91	20.58	+13 19 25.9	24.2	9.422	+48.64	−2 6.80	15 55.29	1 5.61	2 14 27.72
27	2 16 7.27	6.91	13 38 46.6	44.7	9.442	48.08	2 16.99	15 55.04	1 5.68	2 18 24.28
28	2 19 54.12	53.73	13 57 53.7	51.7	9.462	47.51	2 26.70	15 54.80	1 5.75	2 22 20.83
29	2 23 41.47	41.06	14 16 47.1	45.0	9.483	46.93	2 35.90	15 54.55	1 5.83	2 26 17.39
30	2 27 29.34	28.90	14 35 26.4	24.3	9.505	46.34	2 44.59	15 54.31	1 5.91	2 30 13.94
May 1	2 31 17.73	17.27	+14 53 51.4	49.2	9.528	+45.74	−2 52.75	15 54.07	1 5.99	2 34 10.50
2	2 35 6.67	6.19	15 11 61.7	59.4	9.551	45.12	3 0.37	15 53.82	1 6.07	2 38 7.05
3	2 38 56.17	55.67	15 29 57.1	54.7	9.574	44.49	3 7.43	15 53.58	1 6.15	2 42 3.61
4	2 42 46.22	45.71	15 47 37.3	34.8	9.597	43.85	3 13.93	15 53.34	1 6.23	2 46 0.17
5	2 46 36.85	36.32	16 4 61.8	59.4	9.621	43.20	3 19.86	15 53.10	1 6.31	2 49 56.72
6	2 50 28.06	27.51	+16 22 10.5	8.1	9.646	+42.53	−3 25.21	15 52.86	1 6.39	2 53 53.28
7	2 54 19.85	19.28	16 39 3.0	0.6	9.670	41.85	3 29.98	15 52.63	1 6.47	2 57 49.83
8	2 58 12.22	11.64	16 55 38.9	36.5	9.694	41.15	3 34.16	15 52.41	1 6.55	3 1 46.39
9	3 2 5.18	4.59	17 11 58.0	55.6	9.719	40.44	3 37.76	15 52.19	1 6.63	3 5 42.95
10	3 5 58.72	58.13	17 27 60.0	57.5	9.743	39.72	3 40.77	15 51.97	1 6.72	3 9 39.50
11	3 9 52.85	52.25	+17 43 44.4	42.0	9.768	+38.99	−3 43.20	15 51.75	1 6.80	3 13 36.06
12	3 13 47.57	46.95	17 59 11.1	8.7	9.792	38.24	3 45.05	15 51.54	1 6.88	3 17 32.61
13	3 17 42.86	42.24	18 14 19.6	17.3	9.816	37.48	3 46.31	15 51.33	1 6.96	3 21 29.17
14	3 21 38.73	38.10	18 29 9.8	7.5	9.840	36.70	3 47.01	15 51.12	1 7.04	3 25 25.72
15	3 25 35.16	34.54	18 43 41.1	38.9	9.863	35.91	3 47.12	15 50.91	1 7.12	3 29 22.28
16	3 29 32.17	31.54	+18 57 53.6	51.4	9.887	+35.12	−3 46.67	15 50.71	1 7.20	3 33 18.84
17	3 33 29.73	29.11	+19 11 46.7	44.6	9.910	+34.31	−3 45.66	15 50.52	1 7.29	3 37 15.40

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

ate.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
ay 17	3 33 29.73	29.11	+19 11 46.7	44.6	9.910	+34.31	−3 45.66	15 50.52	1 7.29	3 37 15.40
18	3 37 27.86	27.24	19 25 20.3	18.3	9.933	33.49	3 44.10	15 50.33	1 7.37	3 41 11.96
19	3 41 26.52	25.91	19 38 34.1	32.2	9.956	32.66	3 42.00	15 50.15	1 7.45	3 45 8.51
20	3 45 25.72	25.11	19 51 27.8	26.0	9.978	31.82	3 39.36	15 49.97	1 7.53	3 49 5.07
21	3 49 25.45	24.85	20 3 61.2	59.4	10.000	30.97	3 36.18	15 49.79	1 7.60	3 53 1.63
22	3 53 25.70	25.11	+20 16 13.9	12.2	10.021	+30.10	−3 32.49	15 49.62	1 7.67	3 56 58.18
23	3 57 26.47	25.89	20 28 5.8	4.2	10.042	29.22	3 28.29	15 49.45	1 7.75	4 0 54.74
24	4 1 27.74	27.17	20 39 36.7	35.1	10.063	28.34	3 23.58	15 49.28	1 7.82	4 4 51.30
25	4 5 29.49	28.94	20 50 46.2	44.7	10.084	27.45	3 18.37	15 49.12	1 7.90	4 8 47.86
26	4 9 31.74	31.20	21 1 34.3	32.9	10.104	26.56	3 12.68	15 48.96	1 7.97	4 12 44.42
27	4 13 34.47	33.95	+21 11 60.8	59.4	10.124	+25.65	−3 6.51	15 48.80	1 8.04	4 16 40.97
28	4 17 37.67	37.17	21 22 5.3	3.9	10.143	24.73	2 59.87	15 48.64	1 8.11	4 20 37.53
29	4 21 41.34	40.85	21 31 47.7	46.4	10.162	23.80	2 52.76	15 48.49	1 8.17	4 24 34.09
30	4 25 45.47	45.00	21 41 7.7	6.6	10.181	22.87	2 45.19	15 48.34	1 8.23	4 28 30.65
31	4 29 50.05	49.60	21 50 5.3	4.3	10.200	21.93	2 37.18	15 48.19	1 8.29	4 32 27.20
une 1	4 33 55.06	54.64	+21 58 40.2	39.3	10.218	+20.98	−2 28.72	15 48.04	1 8.34	4 36 23.76
2	4 38 0.51	0.11	22 6 52.3	51.5	10.236	20.02	2 19.83	15 47.89	1 8.40	4 40 20.32
3	4 42 6.37	6.00	22 14 41.2	40.6	10.253	19.06	2 10.53	15 47.75	1 8.46	4 44 16.88
4	4 46 12.63	12.28	22 22 7.0	6.4	10.269	18.09	2 0.83	15 47.61	1 8.51	4 48 13.44
5	4 50 19.26	18.95	22 29 9.3	8.8	10.284	17.11	1 50.75	15 47.47	1 8.56	4 52 9.99
6	4 54 26.26	25.97	+22 35 48.1	47.6	10.299	+16.12	−1 40.31	15 47.34	1 8.61	4 56 6.55
7	4 58 33.60	33.34	22 42 3.2	2.7	10.313	15.13	1 29.52	15 47.22	1 8.65	5 0 3.11
8	5 2 41.26	41.03	22 47 54.4	54.0	10.325	14.13	1 18.42	15 47.11	1 8.69	5 3 59.67
9	5 6 49.21	49.02	22 53 21.5	21.3	10.337	13.13	1 7.02	15 47.00	1 8.73	5 7 56.23
10	5 10 57.44	57.28	22 58 24.5	24.3	10.348	12.12	0 55.35	15 46.89	1 8.77	5 11 52.78
11	5 15 5.92	5.79	+23 3 3.3	3.1	10.358	+11.11	−0 43.43	15 46.78	1 8.80	5 15 49.34
12	5 19 14.62	14.53	23 7 17.7	17.5	10.367	10.09	0 31.29	15 46.68	1 8.83	5 19 45.90
13	5 23 23.53	23.47	23 11 7.6	7.5	10.375	9.07	0 18.94	15 46.59	1 8.85	5 23 42.46
14	5 27 32.60	32.58	23 14 32.9	32.9	10.382	8.05	−0 6.42	15 46.50	1 8.87	5 27 39.02
15	5 31 41.82	41.84	23 17 33.7	33.7	10.387	7.02	+0 6.25	15 46.41	1 8.89	5 31 35.58
16	5 35 51.17	51.22	+23 20 9.8	9.8	10.391	+ 5.99	+0 19.03	15 46.33	1 8.91	5 35 32.14
17	5 40 0.61	0.70	23 22 21.2	21.2	10.395	4.96	0 31.92	15 46.27	1 8.92	5 39 28.69
18	5 44 10.12	10.24	23 24 7.8	7.8	10.397	3.93	0 44.87	15 46.20	1 8.93	5 43 25.25
19	5 48 19.67	19.83	23 25 29.7	29.7	10.398	2.90	0 57.86	15 46.14	1 8.94	5 47 21.81
20	5 52 29.23	29.44	23 26 26.8	26.8	10.399	1.87	1 10.87	15 46.08	1 8.95	5 51 18.37
21	5 56 38.79	39.03	+23 26 59.1	59.1	10.398	+ 0.83	+1 23.88	15 46.03	1 8.95	5 55 14.93
22	6 0 48.32	48.60	23 27 6.6	6.6	10.396	− 0.20	1 36.85	15 45.98	1 8.95	5 59 11.49
23	6 4 57.80	58.11	23 26 49.4	49.4	10.393	1.23	1 49.77	15 45.93	1 8.94	6 3 8.04
24	6 9 7.20	7.55	23 26 7.5	7.4	10.390	2.26	2 2.61	15 45.89	1 8.93	6 7 4.60
25	6 13 16.51	16.89	23 25 0.8	0.7	10.386	3.29	2 15.36	15 45.85	1 8.92	6 11 1.16
26	6 17 25.70	26.12	+23 23 29.4	29.3	10.381	− 4.32	+2 28.00	15 45.82	1 8.91	6 14 57.72
27	6 21 34.76	35.22	23 21 33.4	33.2	10.375	5.35	2 40.51	15 45.79	1 8.89	6 18 54.28
28	6 25 43.68	44.18	23 19 12.9	12.6	10.369	6.37	2 52.87	15 45.76	1 8.86	6 22 50.84
29	6 29 52.44	52.97	23 16 27.8	27.4	10.362	7.39	3 5.07	15 45.73	1 8.83	6 26 47.40
30	6 34 1.01	1.58	23 13 18.2	17.7	10.353	8.41	3 17.08	15 45.71	1 8.80	6 30 43.95
July 1	6 38 9.38	9.98	+23 9 44.2	43.6	10.344	− 9.43	+3 28.89	15 45.69	1 8.77	6 34 40.51
2	6 42 17.53	18.16	+23 5 45.8	45.2	10.335	−10.44	+3 40.49	15 45.67	1 8.74	6 38 37.07

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
July 1	6 38 9.38	9.98	+23 9 44.2	43.6	10.344	− 9.43	+3 28.89	15 45.69	1 8.77	6 34 40.51
2	6 42 17.53	18.16	23 5 45.8	45.2	10.335	10.44	3 40.49	15 45.67	1 8.74	6 38 37.07
3	6 46 25.43	26.10	23 1 23.3	22.5	10.324	11.45	3 51.84	15 45.66	1 8.70	6 42 33.62
4	6 50 33.08	33.78	22 56 36.6	35.7	10.313	12.45	4 2.93	15 45.65	1 8.66	6 46 30.18
5	6 54 40.44	41.17	22 51 25.8	24.8	10.301	13.45	4 13.73	15 45.64	1 8.62	6 50 26.74
6	6 58 47.50	48.25	+22 45 51.1	50.1	10.287	−14.44	+ 4 24.22	15 45.64	1 8.57	6 54 23.30
7	7 2 54.22	55.00	22 39 52.7	51.6	10.273	15.43	4 34.39	15 45.65	1 8.52	6 58 19.86
8	7 7 0.59	1.40	22 33 30.6	29.4	10.258	16.41	4 44.21	15 45.66	1 8.47	7 2 16.42
9	7 11 6.61	7.44	22 26 45.0	43.7	10.242	17.38	4 53.66	15 45.68	1 8.41	7 6 12.98
10	7 15 12.23	13.09	22 19 36.2	34.7	10.226	18.35	5 2.72	15 45.70	1 8.35	7 10 9.54
11	7 19 17.44	18.32	+22 12 4.2	2.5	10.208	−19.31	+5 11.37	15 45.73	1 8.29	7 14 6.09
12	7 23 22.22	23.12	22 4 9.2	7.4	10.190	20.27	5 19.59	15 45.76	1 8.23	7 18 2.65
13	7 27 26.55	27.47	21 55 51.4	49.5	10.171	21.22	5 27.36	15 45.80	1 8.17	7 21 59.21
14	7 31 30.40	31.35	21 47 11.1	9.0	10.151	22.15	5 34.66	15 45.85	1 8.10	7 25 55.77
15	7 35 33.78	34.74	21 38 8.4	6.2	10.130	23.07	5 41.48	15 45.90	1 8.03	7 29 52.33
16	7 39 36.64	37.62	+21 28 43.6	41.3	10.109	−23.99	+5 47.79	15 45.95	1 7.96	7 33 48.88
17	7 43 38.99	39.98	21 18 57.0	54.5	10.087	24.90	5 53.57	15 46.01	1 7.89	7 37 45.44
18	7 47 40.80	41.80	21 8 48.7	46.1	10.065	25.79	5 58.82	15 46.08	1 7.82	7 41 42.00
19	7 51 42.06	43.07	20 58 19.0	16.2	10.041	26.68	6 3.52	15 46.15	1 7.75	7 45 38.56
20	7 55 42.75	43.78	20 47 28.0	25.2	10.017	27.56	6 7.66	15 46.23	1 7.67	7 49 35.11
21	7 59 42.88	43.92	+20 36 16.2	13.3	9.993	−28.43	+6 11.23	15 46.31	1 7.59	7 53 31.67
22	8 3 42.44	43.48	20 24 43.7	40.7	9.969	29.28	6 14.23	15 46.39	1 7.51	7 57 28.23
23	8 7 41.41	42.45	20 12 50.7	47.6	9.945	30.13	6 16.64	15 46.48	1 7.43	8 1 24.78
24	8 11 39.79	40.83	20 0 37.5	34.3	9.920	30.97	6 18.46	15 46.57	1 7.35	8 5 21.34
25	8 15 37.58	38.63	19 48 4.3	1.0	9.896	31.79	6 19.69	15 46.66	1 7.26	8 9 17.90
26	8 19 34.79	35.84	+19 35 11.5	8.0	9.871	−32.61	+6 20.33	15 46.75	1 7.18	8 13 14.46
27	8 23 31.40	32.45	19 21 59.1	55.6	9.847	33.42	6 20.38	15 46.85	1 7.09	8 17 11.01
28	8 27 27.42	28.46	19 8 27.5	23.9	9.822	34.21	6 19.84	15 46.95	1 7.01	8 21 7.57
29	8 31 22.85	23.88	18 54 36.9	33.2	9.797	35.00	6 18.72	15 47.05	1 6.92	8 25 4.13
30	8 35 17.70	18.72	18 40 27.5	23.8	9.773	35.78	6 17.00	15 47.16	1 6.83	8 29 0.68
31	8 39 11.95	12.96	+18 25 59.6	55.9	9.748	−36.54	+6 14.70	15 47.27	1 6.74	8 32 57.24
Aug. 1	8 43 5.62	6.62	18 11 13.5	9.7	9.724	37.30	6 11.81	15 47.39	1 6.66	8 36 53.80
2	8 46 58.70	59.69	17 56 9.5	5.6	9.699	38.04	6 8.33	15 47.51	1 6.57	8 40 50.35
3	8 50 51.19	52.17	17 40 47.9	43.9	9.675	38.77	6 4.26	15 47.63	1 6.49	8 44 46.91
4	8 54 43.10	44.06	17 25 8.8	4.9	9.651	39.48	5 59.61	15 47.75	1 6.40	8 48 43.47
5	8 58 34.41	35.36	+17 9 12.8	8.8	9.626	−40.19	+5 54.37	15 47.88	1 6.31	8 52 40.02
6	9 2 25.14	26.07	16 52 59.9	55.9	9.602	40.88	5 48.54	15 48.02	1 6.22	8 56 36.58
7	9 6 15.29	16.20	16 36 30.6	26.6	9.577	41.56	5 42.13	15 48.16	1 6.13	9 0 33.14
8	9 10 4.86	5.74	16 19 45.0	41.1	9.553	42.23	5 35.14	15 48.30	1 6.05	9 4 29.69
9	9 13 53.84	54.71	16 2 43.7	39.8	9.529	42.88	5 27.57	15 48.45	1 5.96	9 8 26.35
10	9 17 42.25	43.09	+15 45 26.8	23.0	9.505	−43.52	+5 19.41	15 48.60	1 5.88	9 12 22.80
11	9 21 30.08	30.89	15 27 54.8	51.0	9.481	44.15	5 10.69	15 48.75	1 5.79	9 16 19.36
12	9 25 17.33	18.13	15 10 7.9	4.2	9.457	44.76	5 1.39	15 48.92	1 5.71	9 20 15.92
13	9 29 4.02	4.79	14 52 6.4	2.8	9.434	45.36	4 51.52	15 49.09	1 5.63	9 24 12.47
14	9 32 50.15	50.89	14 33 50.9	47.3	9.410	45.94	4 41.09	15 49.27	1 5.55	9 28 9.03
15	9 36 35.71	36.42	+14 15 21.4	17.9	9.387	−46.51	+4 30.10	15 49.45	1 5.47	9 32 5.58
16	9 40 20.72	21.40	+13 56 38.5	35.0	9.364	−47.07	+4 18.55	15 49.63	1 5.40	9 36 2.14

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.19$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

ate.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
ug.16	9 40 20.72	21.40	+13 56 38.5	35.0	9.364	−47.07	+ 4 18.55	15 49.63	1 5.40	9 36 2.14
17	9 44 5.19	5.83	13 37 42.3	39.0	9.341	47.61	4 6.46	15 49.82	1 5.33	9 39 58.69
18	9 47 49.12	49.72	13 18 33.3	30.2	9.319	48.14	3 53.84	15 50.01	1 5.26	9 43 55.25
19	9 51 32.52	33.09	12 59 11.8	8.8	9.298	48.65	3 40.69	15 50.20	1 5.18	9 47 51.80
20	9 55 15.42	15.95	12 39 38.0	35.2	9.277	49.15	3 27.03	15 50.39	1 5.11	9 51 48.36
21	9 58 57.81	58.31	+12 19 52.3	49.6	9.256	−49.65	+ 3 12.86	15 50.59	1 5.04	9 55 44.91
22	10 2 39.72	40.18	11 59 55.0	52.4	9.236	50.13	2 58.22	15 50.79	1 4.98	9 59 41.47
23	10 6 21.17	21.58	11 39 46.3	43.9	9.217	50.60	2 43.12	15 50.99	1 4.91	10 3 38.02
24	10 10 2.17	2.54	11 19 26.5	24.4	9.199	51.05	2 27.56	15 51.19	1 4.85	10 7 34.58
25	10 13 42.73	43.06	10 58 56.0	54.2	9.181	51.49	2 11.57	15 51.40	1 4.78	10 11 31.13
26	10 17 22.88	23.17	+10 38 15.1	13.5	9.164	−51.92	+ 1 55.17	15 51.61	1 4.72	10 15 27.69
27	10 21 2.63	2.88	10 17 24.0	22.6	9.148	52.34	1 38.37	15 51.82	1 4.66	10 19 24.24
28	10 24 42.01	42.21	9 56 23.0	21.7	9.133	52.75	1 21.19	15 52.03	1 4.60	10 23 20.80
29	10 28 21.03	21.19	9 35 12.4	11.4	9.119	53.14	1 3.66	15 52.24	1 4.54	10 27 17.35
30	10 31 59.71	59.83	9 13 52.4	51.7	9.105	53.52	0 45.79	15 52.46	1 4.49	10 31 13.90
31	10 35 38.06	38.13	+ 8 52 23.6	23.1	9.091	−53.88	+ 0 27.60	15 52.68	1 4.44	10 35 10.46
pt. 1	10 39 16.10	16.12	8 30 46.0	45.9	9.079	54.24	+ 0 9.09	15 52.90	1 4.39	10 39 7.01
2	10 42 53.85	53.82	8 9 0.2	0.4	9.067	54.58	− 0 9.72	15 53.12	1 4.35	10 43 3.57
3	10 46 31.33	31.25	7 47 6.4	6.8	9.056	54.90	0 28.79	15 53.34	1 4.31	10 47 0.12
4	10 50 8.54	8.42	7 25 4.9	5.6	9.045	55.21	0 48.13	15 53.57	1 4.27	10 50 56.67
5	10 53 45.51	45.34	+ 7 2 56.1	57.1	9.035	−55.51	− 1 7.71	15 53.80	1 4.23	10 54 53.23
6	10 57 22.26	22.04	6 40 40.2	41.6	9.026	55.80	1 27.51	15 54.04	1 4.20	10 58 49.78
7	11 0 58.79	58.52	6 18 17.8	19.4	9.018	56.07	1 47.52	15 54.28	1 4.17	11 2 46.34
8	11 4 35.13	34.81	5 55 49.0	50.9	9.010	56.32	2 7.73	15 54.52	1 4.14	11 6 42.89
9	11 8 11.29	10.92	5 33 14.3	16.6	9.003	56.56	2 28.12	15 54.76	1 4.11	11 10 39.44
10	11 11 47.28	46.86	+ 5 10 34.0	36.7	8.996	−56.79	− 2 48.68	15 55.01	1 4.09	11 14 36.00
11	11 15 23.12	22.65	4 47 48.5	51.5	8.990	57.00	3 9.39	15 55.27	1 4.07	11 18 32.55
12	11 18 58.83	58.30	4 24 58.1	61.4	8.985	57.20	3 30.23	15 55.53	1 4.05	11 22 29.11
13	11 22 34.42	33.84	4 2 3.1	6.9	8.980	57.38	3 51.19	15 55.79	1 4.04	11 26 25.66
14	11 26 9.90	9.27	3 39 4.1	8.2	8.976	57.54	4 12.25	15 56.05	1 4.03	11 30 22.21
15	11 29 45.30	44.61	+ 3 16 1.3	5.7	8.973	−57.69	− 4 33.40	15 56.31	1 4.02	11 34 18.77
16	11 33 20.63	19.89	2 52 54.9	59.7	8.971	57.83	4 54.62	15 56.57	1 4.01	11 38 15.32
17	11 36 55.91	55.12	2 29 45.4	50.5	8.970	57.96	5 15.89	15 56.84	1 4.01	11 42 11.87
18	11 40 31.16	30.32	2 6 33.1	38.6	8.969	58.07	5 37.18	15 57.11	1 4.01	11 46 8.43
19	11 44 6.41	5.52	1 43 18.3	24.1	8.969	58.16	5 58.48	15 57.37	1 4.01	11 50 4.98
20	11 47 41.68	40.73	+ 1 20 1.3	7.4	8.970	−58.25	− 6 19.76	15 57.64	1 4.02	11 54 1.53
21	11 51 16.99	15.99	0 56 42.4	48.9	8.972	58.32	6 41.00	15 57.91	1 4.03	11 57 58.09
22	11 54 52.37	51.32	0 33 21.9	28.8	8.976	58.38	7 2.17	15 58.18	1 4.04	12 1 54.64
23	11 58 27.83	26.73	+ 0 10 0.2	7.4	8.980	58.43	7 23.25	15 58.46	1 4.06	12 5 51.19
24	12 2 3.41	2.25	− 0 13 22.5	15.0	8.985	58.46	7 44.22	15 58.73	1 4.08	12 9 47.75
25	12 5 39.12	37.91	− 0 36 45.9	38.0	8.991	−58.48	− 8 5.06	15 59.00	1 4.10	12 13 44.30
26	12 9 15.00	13.73	1 0 9.6	1.4	8.998	58.49	8 25.73	15 59.27	1 4.12	12 17 40.85
27	12 12 51.06	49.74	1 23 33.3	24.8	9.007	58.48	8 46.22	15 59.53	1 4.15	12 21 37.41
28	12 16 27.32	25.96	1 46 56.7	47.8	9.016	58.46	9 6.51	15 59.80	1 4.18	12 25 33.96
29	12 20 3.82	2.40	2 10 19.4	10.1	9.026	58.43	9 26.57	16 0.07	1 4.21	12 29 30.51
30	12 23 40.56	39.09	− 2 33 41.1	31.5	9.037	−58.38	− 9 46.38	16 0.34	1 4.24	12 33 27.07
ct. 1	12 27 17.57	16.05	− 2 56 61.4	51.5	9.048	−58.31	−10 5.91	16 0.61	1 4.28	12 37 23.62

Note.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Oct. 1	12 27 17.57	16.05	− 2 56 61.4	51.5	9.048	−58.31	−10 5.91	16 0.61	1 4.28	12 37 23.6
2	12 30 54.88	53.30	3 20 19.9	9.8	9.061	58.23	10 25.15	16 0.88	1 4.32	12 41 20.1
3	12 34 32.50	30.87	3 43 36.4	26.0	9.074	58.14	10 44.08	16 1.15	1 4.37	12 45 16.7
4	12 38 10.45	8.78	4 6 50.5	39.8	9.089	58.03	11 2.68	16 1.42	1 4.42	12 49 13.2
5	12 41 48.76	47.04	4 29 61.7	50.7	9.104	57.90	11 20.93	16 1.69	1 4.47	12 53 9.8
6	12 45 27.43	25.66	− 4 52 69.7	58.5	9.119	−57.76	−11 38.81	16 1.96	1 4.52	12 57 6.3
7	12 49 6.49	4.67	5 16 14.1	2.7	9.136	57.61	11 56.30	16 2.24	1 4.58	13 1 2.0
8	12 52 45.96	44.09	5 39 14.6	2.9	9.153	57.43	12 13.39	16 2.52	1 4.64	13 4 59.5
9	12 56 25.84	23.93	6 1 70.6	58.7	9.171	57.24	12 30.06	16 2.79	1 4.70	13 8 56.0
10	13 0 6.16	4.20	6 24 61.9	49.7	9.189	57.03	12 46.30	16 3.07	1 4.77	13 12 52.6
11	13 3 46.92	44.92	− 6 47 47.9	35.6	9.208	−56.80	−13 2.09	16 3.35	1 4.84	13 16 49.1
12	13 7 28.15	26.11	7 10 28.4	15.9	9.228	56.56	13 17.42	16 3.63	1 4.91	13 20 45.7
13	13 11 9.86	7.77	7 32 62.9	50.3	9.248	56.31	13 32.27	16 3.91	1 4.99	13 24 42.2
14	13 14 52.06	49.93	7 55 31.1	18.3	9.269	56.04	13 46.62	16 4.19	1 5.07	13 28 38.8
15	13 18 34.78	32.61	8 17 52.6	39.5	9.291	55.75	14 0.46	16 4.47	1 5.15	13 32 35.3
16	13 22 18.02	15.82	− 8 39 66.8	53.7	9.313	−55.44	−14 13.78	16 4.76	1 5.23	13 36 31.9
17	13 25 61.81	59.57	9 2 13.6	0.4	9.336	55.12	14 26.54	16 5.05	1 5.31	13 40 28.4
18	13 29 46.17	43.89	9 23 72.6	59.2	9.360	54.79	14 38.74	16 5.33	1 5.40	13 44 25.0
19	13 33 31.12	28.80	9 45 63.3	49.9	9.385	54.44	14 50.35	16 5.60	1 5.49	13 48 21.5
20	13 37 16.67	14.31	10 7 45.5	32.0	9.411	54.07	15 1.36	16 5.87	1 5.58	13 52 18.1
21	13 41 2.85	0.45	−10 29 18.8	5.2	9.437	−53.69	−15 11.74	16 6.14	1 5.67	13 56 14.7
22	13 44 49.67	47.24	10 50 42.8	29.1	9.465	53.30	15 21.48	16 6.41	1 5.77	14 0 11.2
23	13 48 37.16	34.69	11 11 57.0	43.4	9.493	52.89	15 30.56	16 6.68	1 5.87	14 4 7.8
24	13 52 25.32	22.83	11 32 61.2	47.6	9.522	52.46	15 38.95	16 6.94	1 5.97	14 8 4.3
25	13 56 14.20	11.68	11 53 55.1	41.4	9.551	52.02	15 46.64	16 7.20	1 6.07	14 12 0.9
26	14 0 3.78	1.24	−12 14 38.1	24.4	9.581	−51.56	−15 53.62	16 7.47	1 6.17	14 15 57.4
27	14 3 54.10	51.54	12 34 69.8	56.3	9.612	51.08	15 59.86	16 7.73	1 6.27	14 19 54.0
28	14 7 45.18	42.59	12 55 30.0	16.5	9.644	50.59	16 5.35	16 7.98	1 6.38	14 23 50.5
29	14 11 37.01	34.40	13 15 38.2	24.7	9.676	50.09	16 10.08	16 8.23	1 6.49	14 27 47.1
30	14 15 29.63	27.00	13 35 34.0	20.6	9.709	49.56	16 14.03	16 8.48	1 6.60	14 31 43.6
31	14 19 23.03	20.38	−13 55 17.0	3.7	9.742	−49.02	−16 17.19	16 8.72	1 6.71	14 35 40.2
Nov. 1	14 23 17.23	14.57	14 14 46.8	33.6	9.775	48.46	16 19.55	16 8.97	1 6.83	14 39 36.8
2	14 27 12.25	9.58	14 33 62.9	49.9	9.809	47.88	16 21.09	16 9.22	1 6.95	14 43 33.3
3	14 31 8.08	5.40	14 52 65.0	52.1	9.844	47.29	16 21.83	16 9.46	1 7.06	14 47 29.0
4	14 35 4.74	2.05	15 11 52.5	39.8	9.878	46.68	16 21.73	16 9.70	1 7.18	14 51 26.4
5	14 38 62.23	59.54	−15 30 25.2	12.6	9.913	−46.05	−16 20.80	16 9.94	1 7.29	14 55 23.0
6	14 42 60.56	57.86	15 48 42.6	30.2	9.948	45.40	16 19.04	16 10.18	1 7.41	14 59 19.5
7	14 46 59.73	57.02	16 6 44.2	32.0	9.983	44.73	16 16.44	16 10.42	1 7.53	15 3 16.1
8	14 50 59.73	57.02	16 24 29.5	17.6	10.017	44.04	16 13.00	16 10.66	1 7.65	15 7 12.6
9	14 54 60.57	57.86	16 41 58.2	46.5	10.052	43.34	16 8.73	16 10.89	1 7.77	15 11 9.2
10	14 58 62.24	59.54	−16 58 69.9	58.4	10.087	−42.62	−16 3.63	16 11.13	1 7.89	15 15 5.8
11	15 3 4.74	2.05	17 15 64.0	52.9	10.121	41.89	15 57.69	16 11.36	1 8.01	15 19 2.3
12	15 7 8.07	5.39	17 32 40.4	29.5	10.156	41.14	15 50.92	16 11.59	1 8.13	15 22 58.9
13	15 11 12.23	9.57	17 48 58.4	47.8	10.191	40.37	15 43.32	16 11.82	1 8.25	15 26 55.4
14	15 15 17.23	14.57	18 4 57.8	47.5	10.225	39.58	15 34.90	16 12.05	1 8.37	15 30 52.0
15	15 19 23.04	20.41	−18 20 38.2	28.2	10.260	−38.78	−15 25.65	16 12.27	1 8.49	15 34 48.50
16	15 23 29.69	27.07	−18 35 59.2	49.6	10.294	−37.96	−15 15.57	16 12.49	1 8.61	15 38 45.15

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
ov.16	15 23 29.69	27.07	−18 35 59.2	49.6	10.294	−37.96	−15 15.57	16 12.49	1 8.61	15 38 45.15
17	15 27 37.16	34.56	18 50 60.4	51.1	10.328	37.13	15 4.66	16 12.70	1 8.73	15 42 41.70
18	15 31 45.46	42.88	19 5 41.5	32.5	10.363	36.28	14 52.93	16 12.91	1 8.85	15 46 38.26
19	15 35 54.57	52.03	19 19 62.1	53.4	10.397	35.42	14 40.38	16 13.12	1 8.96	15 50 34.82
20	15 40 4.50	1.99	19 33 61.8	53.4	10.431	34.55	14 27.01	16 13.32	1 9.07	15 54 31.37
21	15 44 15.25	12.77	−19 47 40.3	32.3	10.465	−33.66	−14 12.82	16 13.52	1 9.18	15 58 27.93
22	15 48 26.80	24.36	20 0 57.2	49.6	10.498	32.75	13 57.83	16 13.71	1 9.29	16 2 24.49
23	15 52 39.16	36.76	20 13 52.2	44.9	10.531	31.83	13 42.04	16 13.90	1 9.40	16 6 21,05
24	15 56 52.31	49.95	20 26 24.9	18.0	10.564	30.89	13 25.45	16 14.08	1 9.50	16 10 17.60
25	16 1 6.24	3.92	20 38 35.0	28.4	10.597	29.94	13 8.08	16 14.26	1 9.61	16 14 14.16
26	16 5 20.95	18.68	−20 50 22.1	15.9	10.629	−28.98	−12 49.94	16 14.44	1 9.71	16 18 10.72
27	16 9 36.41	34.20	21 1 45.9	40.1	10.660	28.00	12 31.03	16 14.61	1 9.82	16 22 7.28
28	16 13 52.63	50.47	21 12 46.1	40.6	10.691	27.01	12 11.37	16 14.77	1 9.92	16 26 3.84
29	16 18 9.59	7.47	21 23 22.3	17.2	10.721	26.01	11 50.98	16 14.93	1 10.02	16 30 0.39
30	16 22 27.26	25.19	21 33 34.3	29.5	10.751	24.99	11 29.87	16 15.08	1 10.11	16 33 56.95
ec. 1	16 26 45.62	43.62	−21 43 21.7	17.2	10.779	−23.96	−11 8.06	16 15.23	1 10.20	16 37 53.51
2	16 31 4.66	2.73	21 52 44.1	39.8	10.807	22.91	10 45.57	16 15.38	1 10.28	16 41 50.07
3	16 35 24.36	22.49	22 1 41.4	37.4	10.834	21.86	10 22.43	16 15.53	1 10.37	16 45 46.62
4	16 39 44.69	42.88	22 10 13.1	9.6	10.860	20.79	9 58.66	16 15.67	1 10.45	16 49 43.18
5	16 44 5.62	3.88	22 18 19.1	16.0	10.884	19.71	9 34.29	16 15.81	1 10.53	16 53 39.74
6	16 48 27.12	25.45	−22 25 59.1	56.3	10.907	−18.62	− 9 9.34	16 15.95	1 10.60	16 57 36.30
7	16 52 49.16	47.57	22 33 12.9	10.4	10.929	17.52	8 43.85	16 16.08	1 10.67	17 1 32.86
8	16 57 11.71	10.20	22 39 60.1	57.9	10.950	16.41	8 17.86	16 16.21	1 10.74	17 5 29.42
9	17 1 34.74	33.30	22 46 20.7	18.6	10.969	15.29	7 51.38	16 16.34	1 10.81	17 9 25.98
10	17 5 58.21	56.85	22 52 14.2	12.5	10.987	14.17	7 24.46	16 16.46	1 10.87	17 13 22.53
11	17 10 22.09	20.82	−22 57 40.7	39.2	11.003	−13.04	− 6 57.13	16 16.57	1 10.93	17 17 19.09
12	17 14 46.35	45.16	23 2 40.0	38.7	11.018	11.90	6 29.43	16 16.68	1 10.98	17 21 15.65
13	17 19 10.96	9.85	23 7 11.8	10.7	11.032	10.76	6 1.37	16 16.79	1 11.03	17 25 12.21
14	17 23 35.88	34.86	23 11 16.0	15.2	11.045	9.60	5 33.00	16 16.90	1 11.07	17 29 8.77
15	17 28 1.09	0.16	23 14 52.6	51.9	11.056	8.44	5 4.34	16 17.01	1 11.11	17 33 5.33
16	17 32 26.56	25.71	−23 18 1.3	0.8	11.066	− 7.28	− 4 35.42	16 17.11	1 11.14	17 37 1.89
17	17 36 52.25	51.49	23 20 42.2	41.8	11.075	6.12	4 6.28	16 17.20	1 11.16	17 40 58.44
18	17 41 18.14	17.47	23 22 55.0	54.8	11.082	4.95	3 36.93	16 17.28	1 11.18	17 44 55.00
19	17 45 44.20	43.62	23 24 39.9	39.7	11.088	3.78	3 7.43	16 17.36	1 11.21	17 48 51.56
20	17 50 10.38	9.90	23 25 56.5	56.4	11.093	2.61	2 37.79	16 17.43	1 11.23	17 52 48.12
21	17 54 36.68	36.29	−23 26 45.0	45.0	11.097	− 1.43	− 2 8.04	16 17.49	1 11.25	17 56 44.68
22	17 59 3.05	2.75	23 27 5.3	5.3	11.100	− 0.26	1 38.22	16 17.55	1 11.26	18 0 41.24
23	18 3 29.46	29.25	23 26 57.3	57.3	11.101	+ 0.92	1 8.36	16 17.61	1 11.26	18 4 37.80
24	18 7 55.88	55.76	23 26 21.1	21.1	11.101	2.10	0 38.49	16 17.66	1 11.26	18 8 34.36
25	18 12 22.28	22.26	23 25 16.6	16.6	11.099	3.28	− 0 8.64	16 17.70	1 11.25	18 12 30.91
26	18 16 48.64	48.70	−23 23 43.8	43.8	11.097	+ 4.45	+ 0 21.16	16 17.74	1 11.24	18 16 27.47
27	18 21 14.90	15.06	23 21 42.9	42.8	11.093	5.63	0 50.89	16 17.77	1 11.23	18 20 24.03
28	18 25 41.06	41.31	23 19 13.7	13.6	11.087	6.80	1 20.50	16 17.79	1 11.21	18 24 20.59
29	18 30 7.08	7.42	23 16 16.4	16.2	11.080	7.97	1 49.96	16 17.81	1 11.18	18 28 17.15
30	18 34 32.92	33.35	23 12 51.1	50.8	11.072	9.14	2 19.25	16 17.82	1 11.15	18 32 13.71
31	18 38 58.54	59.06	−23 8 57.8	57.4	11.063	+10.30	+ 2 48.33	16 17.83	1 11.12	18 36 10.27
32	18 43 23.92	24.52	−23 4 36.7	36.1	11.052	+11.46	+ 3 17.16	16 17.84	1 11.08	18 40 6.83

Note.—For mean time interval of semidiameter passing meridian, subtract $0^s.19$ from the sidereal interval.

MEAN ERRORS OF NEWCOMB'S PLACES FOR 1920 OF STARS OF THE AMERIC EPHEMERIS AND NAUTICAL ALMANAC.

Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920.		Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean E	
				a	δ					a	
		h m	°	s	″			h m	°	s	
1131	ι Herculis	17 37	+46	.018	.17	1240	δ Draconis	19 13	+68	.016	
1132	ω Draconis	37	+69	.021	.21	1239	d Sagittarii	13	−19	.014	
1129	η Pavonis	38	−65	.067	.58	1241	θ Lyræ	14	+38	.025	
1134	β Ophiuchi	40	+ 5	.013	.17	1242	ω Aquilæ	14	+11	.019	
1135	ι^1 Scorpii	42	−40	.066	.54	1243	κ Cygni	15	+53	.019	
1137	μ Herculis	17 43	+28	.014	.19	1248	τ Draconis	19 17	+73	.019	
1140	ψ Draconis	43	+72	.021	.20	1251	δ Aquilæ	21	+ 3	.012	
1138	γ Ophiuchi	44	+ 3	.017	.21	1259	β Cygni	27	+28	.014	
1146	ξ Draconis	52	+57	.021	.21	1260	ι Cygni	28	+52	.020	
1145	89 Herculis	52	+26	.025	.33	1264	μ Aquilæ	30	+ 7	.024	
1150	35 Draconis	17 53	+77	.022	.23	1265	h Sagittarii	19 32	−25	.019	
1147	θ Herculis	54	+37	.017	.21	1224	σ Octantis	32	−89	.025	
1148	ν Ophiuchi	55	−10	.016	.22	1266	κ Aquilæ	33	− 7	.018	
1149	ξ Herculis	55	+29	.034	.30	1269	θ Cygni	34	+50	.019	
1151	γ Draconis	55	+51	.013	.16	1271	54 Sagittarii	36	−16	.022	
1152	67 Ophiuchi	17 57	+ 3	.031	.26	1273	β Sagittæ	19 37	+17	.016	
1164	δ Urs. Min.	17 58	+87	....	...	1281	15 Cygni	41	+37	.029	
1156	θ Aræ	18 0	−50	.056	.50	1280	f Sagittarii	42	−20	.020	
1158	γ Sagittarii	1	−30	.021	.39	1282	γ Aquilæ	42	+10	.009	
1159	70 Ophiuchi	1	+ 3	.022	.26	1283	δ Cygni	42	+45	.021	
1160	72 Ophiuchi	18 4	+10	.016	.19	1284	δ Sagittæ	19 44	+18	.017	
1161	o Herculis	4	+29	.019	.22	1286	α Aquilæ	47	+ 9	.010	
1153	χ Octantis	8	−88	.034	.30	1288	η Aquilæ	48	+ 1	.022	
1166	μ Sagittarii	9	−21	.016	.19	1290	ε Draconis	48	+70	.024	
1169	η Sagittarii	12	−37	.057	.50	1289	ι Sagittarii	50	−42	.073	
1170	Gr. 2533	18 13	+42	.035	.40	1291	ε Pavonis	19 51	−73	....	
1171	36 Draconis	13	+64	.020	.21	1292	β Aquilæ	51	+ 6	.008	
1173	δ Sagittarii	15	−30	.020	.25	1297	γ Sagittæ	55	+19	.017	
1174	η Serpentis	17	− 3	.016	.17	1299	c Sagittarii	19 58	−28	.017	
1175	ε Sagittarii	19	−34	.055	.46	1304	τ Aquilæ	20 0	+ 7	.022	
1178	109 Herculis	18 20	+22	.018	.21	1308	θ Aquilæ	20 7	− 1	.013	
1179	α Telescopii	21	−46	.049	.41	1314	o Cygni *seq.*	11	+46	.019	
1185	χ Draconis	23	+73	.020	.20	1318	κ Cephei	12	+77	.018	
1182	λ Sagittarii	23	−25	.017	.22	1319	24 Vulpeculæ	13	+24	.025	
1187	c Serpentis	26	− 2	.027	.38	1320	α^2 Capricorni	14	−13	.012	
1189	1 Aquilæ	18 31	− 8	.013	.25	1321	β Capricorni	20 17	−15	.022	
1190	ζ Pavonis	34	−71	.016	.40	1324	α Pavonis	19	−57	....	
1193	α Lyræ	34	+39	.009	.15	1325	γ Cygni	19	+40	.013	
1196	2 Aquilæ	38	− 9	.029	.30	1328	π Capricorni	23	−18	.019	
1199	φ Sagittarii	41	−27	.022	.26	1329	ρ Capricorni	24	−18	.018	
1202	110 Herculis	18 42	+20	.020	.22	1332	41 Cygni	20 26	+30	.029	
1204	6 Aquilæ	43	− 5	.020	.32	1336	θ Cephei	28	+63	.018	
1206	λ Pavonis	45	−62	.059	.52	1337	ε Delphini	29	+11	.013	
1209	β Lyræ	47	+33	.013	.16	1340	Gr. 3241	30	+72	.034	
1212	50 Draconis	49	+75	.031	.25	1341	α Indi	32	−48	.046	
1213	o Draconis	18 50	+59	.028	.21	1344	β Delphini	20 34	+14	.016	
1211	σ Sagittarii	50	−26	.018	.27	1348	υ Capricorni	35	−18	.023	
1215	θ Serp. *pr.*	52	+ 4	.017	.25	1349	α Delphini	36	+16	.014	
1218	R Lyræ	53	+44	.025	.31	1350	β Pavonis	38	−66	....	
1220	γ Lyræ	56	+33	.018	.22	1352	α Cygni	39	+45	.010	[illegible]
1219	ε Aquilæ	18 56	+15	.017	.19	1353	δ Delphini	20 40	+15	.019	.24
1222	ζ Sagittarii	58	−30	.042	.37	1354	ψ Capricorni	41	−26	.028	.32
1255	λ Urs. Min.	18 59	+89	....	...	1356	γ Delph. *seq.*	43	+16	.024	.30
1226	ζ Aquilæ	19 2	+14	.014	.15	1357	ε Cygni	43	+34	.014	.21
1227	λ Aquilæ	2	− 5	.014	.23	1358	ε Aquarii	43	−10	.014	.19
1228	α Cor. Aust.	19 4	−38	.050	.42	1361	η Cephei	20 44	+62	.018	.16
1230	ι Lyræ	4	+36	.025	.29	1366	μ Aquarii	48	− 9	.016	.22
1231	π Sagittarii	5	−21	.019	.23	1368	76 Draconis	48	+82	.022	.21
7	ψ Sagittarii	19 11	−25	.021	.31	1364	β Indi	20 49	[illegible]	[illegible]	[illegible]

N ERRORS OF NEWCOMB'S PLACES FOR 1920 OF STARS OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920. α	Mean Error 1920. δ	Cat. No.	Name.	R. A. 1920.	Decl. 1920.	Mean Error 1920. α	Mean Error 1920. δ
		h m	°	s	″			h m	°	s	″
	32 Vulpeculæ	20 51	+28	.018	.22	1495	10 Lacertæ	22 36	+39	.027	.30
	220 Draco.(H^1.)	51	+80	.021	.25	1497	ε Pisc. Aust.	36	−27	.028	.38
	ν Cygni	54	+41	.022	.22	1499	ζ Pegasi	37	+10	.013	.17
	α Octantis	55	−77	.055	.46	1500	β Gruis	38	−47	.060	.46
	γ Microscop.	20 56	−33	.037	.49	1498	β Octantis	38	−82	.036	.30
	θ Capricorni	21 1	−18	.017	.22	1501	η Pegasi	22 39	+30	.017	.21
	ξ Cygni	2	+44	.018	.20	1504	λ Pegasi	43	+23	.016	.21
	61 Cygni *pr.*	3	+38	.020	.19	1505	ε Gruis	44	−52	.052	.48
	ν Aquarii	5	−12	.019	.28	1506	τ Aquarii	45	−14	.018	.24
	Br. 2777	7	+78	.023	.21	1507	μ Pegasi	46	+24	.016	.19
	3 Pisc. Aust.	21 9	−28	.032	.46	1510	ι Cephei	22 47	+66	.014	.17
	ζ Cygni	10	+30	.015	.18	1512	λ Aquarii	48	− 8	.013	.19
	τ Cygni	12	+38	.022	.22	1513	ρ Indi	49	−71	.051	.62
	α Equulei	12	+ 5	.015	.20	1514	δ Aquarii	50	−16	.019	.25
	σ Cygni	14	+39	.021	.28	1516	α Pisc. Aust.	53	−30	.032	.28
	θ^1 Microscop.	21 16	−41	.074	.80	1520	ο Androm.	22 58	+42	.017	.22
	α Cephei	17	+62	.016	.14	1523	β Pegasi	23 0	+28	.020	.21
	ι Capricorni	18	−17	.021	.25	1525	α Pegasi	1	+15	.010	.14
	1 Pegasi	18	+19	.020	.27	1528	55 Pegasi	3	+ 9	.029	.40
	γ Pavonis	20	−66	.061	.43	1531	c^2 Aquarii	5	−22	.023	.32
1403	ζ Capricorni	21 22	−23	.024	.31	1533	π Cephei	23 5	+75	.019	.21
1406	g Cygni	27	+46	.028	.29	1532	ι Gruis	6	−46	.064	.56
1407	β Aquarii	27	− 6	.018	.18	1534	59 Pegasi	8	+ 8	.028	.41
1409	β Cephei	28	+70	.014	.14	1535	5 Cassiop.(H^1.)	9	+57	.030	.31
1415	ξ Aquarii	33	− 8	.016	.22	1536	φ Aquarii	10	− 6	.016	.22
1416	74 Cygni	21 34	+40	.029	.31	1537	ψ Aquarii	23 12	−10	.020	.29
1417	γ Capricorni	36	−17	.018	.26	1539	γ Tucanæ	13	−59	.044	.38
1418	λ Octantis	39	−83	.065	.51	1540	γ Piscium	13	+ 3	.013	.16
1424	ε Pegasi	40	+10	.012	.18	1542	γ Sculptoris	15	−33	.053	.46
1426	11 Cephei	41	+71	.028	.26	1544	ο Cephei	15	+68	.025	.25
1428	δ Capricorni	21 43	−16	.017	.21	1546	τ Pegasi	23 17	+23	.020	.25
1431	π^2 Cygni	44	+49	.022	.24	1548	b^1 Aquarii	19	−21	.024	.32
1433	μ Capricorni	49	−14	.016	.23	1550	4 Cassiop.	21	+62	.022	.23
1434	γ Gruis	49	−38	.064	.52	1549	υ Pegasi	21	+23	.020	.24
1435	16 Pegasi	49	+26	.018	.22	1552	κ Piscium	23	+ 1	.014	.19
1439	79 Draconis	21 52	+73	.023	.25	1553	θ Piscium	23 24	+ 6	.019	.26
1444	20 Pegasi	57	+13	.022	.25	1555	70 Pegasi	25	+12	.022	.26
1442	ε Indi	21 57	−57	.058	.80	1559	39 H. Cephei	28	+87	.018	.21
1449	α Aquarii	22 2	− 1	.010	.13	1558	β Sculptoris	29	−38	.046	.47
1450	ι Aquarii	2	−14	.020	.22	1561	72 Pegasi	30	+31	.026	.30
1452	20 Cephei	22 3	+62	.029	.29	1567	λ Androm.	23 34	+46	.016	.20
1451	α Gruis	3	−47	. . . .	. . .	1568	ι Androm.	34	+43	.021	.21
1453	ι Pegasi	3	+25	.019	.21	1569	ι Piscium	36	+ 5	.013	.19
1456	θ Pegasi	6	+ 6	.017	.22	1570	γ Cephei	36	+77	.014	.14
1457	π Pegasi	6	+33	.022	.25	1572	κ Androm.	36	+44	.020	.23
1459	ζ Cephei	22 8	+58	.018	.18	1574	ω^2 Aquarii	23 39	−15	.023	.37
1460	24 Cephei	8	+72	.021	.22	1576	i^1 Aquarii	40	−19	.022	.27
1466	θ Aquarii	13	− 8	.013	.21	1577	ψ Androm.	42	+46	.023	.39
1467	α Tucanæ	13	−61	.041	.32	1580	41 H. Cephei	44	+67	.024	.27
1469	υ Octantis	17	−86	.026	.22	1581	δ Sculptoris	45	−29	.024	.33
1473	γ Aquarii	22 18	− 2	.013	.18	1582	γ^1 Octantis	23 47	−82	.032	.29
1474	31 Pegasi	18	+12	.024	.28	1583	φ Pegasi	48	+19	.023	.31
1477	3 Lacertæ	20	+52	.018	.20	1586	ρ Cassiop.	50	+57	.032	.28
1478	π Aquarii	21	+ 1	.018	.30	1587	Gr. 4163	51	+74	.032	.37
1483	σ Aquarii	26	−11	.016	.21	1592	ω Piscium	55	+ 6	.013	.16
1488	α Lacertæ	22 28	+50	.020	.19	1593	ε Tucanæ	23 56	−66	.071	.60
1489	υ Aquarii	30	−21	.026	.33	1595	30 Piscium	58	− 6	.022	.28
1491	226 B. Cephei	31	+76	.026	.25	1596	2 Ceti	23 59	−18	.018	.22
1490	η Aquarii	22 31	− 1	.013	.19						

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Jan. 1	18 44 28.76	29.40	−23 3 30.2	29.5	11.042	+11.71	+ 3 24.99	16 17.90	1 11.07	18 41 3.8
2	18 48 53.62	54.34	22 58 34.9	34.0	11.029	12.87	3 53.29	16 17.90	1 11.03	18 45 0.4
3	18 53 18.15	18.95	22 53 12.2	11.1	11.015	14.02	4 21.26	16 17.90	1 10.98	18 48 56.9
4	18 57 42.32	43.21	22 47 22.2	20.9	10.999	15.15	4 48.88	16 17.89	1 10.93	18 52 53.5
5	19 2 6.10	7.07	22 41 5.0	3.7	10.983	16.28	5 16.11	16 17.88	1 10.87	18 56 50.0
6	19 6 29.48	30.52	−22 34 20.8	19.3	10.965	+17.40	+ 5 42.94	16 17.86	1 10.81	19 0 46.6
7	19 10 52.43	53.54	22 27 9.8	7.9	10.947	18.51	6 9.33	16 17.83	1 10.75	19 4 43.1
8	19 15 14.92	16.11	22 19 32.3	30.1	10.927	19.62	6 35.25	16 17.80	1 10.68	19 8 39.7
9	19 19 36.92	38.19	22 11 28.3	25.9	10.905	20.71	7 0.71	16 17.76	1 10.61	19 12 36.3
10	19 23 58.40	59.75	22 2 58.2	55.4	10.884	21.80	7 25.64	16 17.72	1 10.54	19 16 32.8
11	19 28 19.35	20.77	−21 53 62.1	59.1	10.861	+22.87	+ 7 50.04	16 17.68	1 10.46	19 20 29.4
12	19 32 39.74	41.23	21 44 40.4	37.1	10.837	23.94	8 13.88	16 17.63	1 10.38	19 24 26.0
13	19 36 59.55	61.09	21 34 53.2	49.6	10.812	24.99	8 37.12	16 17.57	1 10.30	19 28 22.5
14	19 41 18.73	20.34	21 24 41.0	37.0	10.786	26.03	8 59.75	16 17.51	1 10.21	19 32 19.1
15	19 45 37.28	38.95	21 13 63.9	59.6	10.759	27.06	9 21.74	16 17.45	1 10.12	19 36 15.6
16	19 49 55.15	56.89	−21 2 62.4	57.8	10.731	+28.07	+ 9 43.06	16 17.37	1 10.03	19 40 12.2
17	19 54 12.34	14.14	20 51 36.7	31.8	10.702	29.07	10 3.69	16 17.30	1 9.93	19 44 8.7
18	19 58 28.82	30.67	20 39 47.2	42.0	10.672	30.05	10 23.61	16 17.23	1 9.83	19 48 5.3
19	20 2 44.57	46.47	20 27 34.2	28.7	10.641	31.02	10 42.80	16 17.16	1 9.73	19 52 1.8
20	20 6 59.57	61.52	20 14 58.2	52.3	10.609	31.98	11 1.24	16 17.08	1 9.63	19 55 58.4
21	20 11 13.81	15.80	−20 1 59.3	53.2	10.577	+32.92	+11 18.92	16 17.00	1 9.53	19 59 55.0
22	20 15 27.28	29.31	19 48 38.1	31.6	10.545	33.84	11 35.83	16 16.91	1 9.43	20 3 51.5
23	20 19 39.95	42.03	19 34 54.8	48.0	10.512	34.75	11 51.94	16 16.82	1 9.33	20 7 48.14
24	20 23 51.83	53.95	19 20 49.9	42.7	10.478	35.65	12 7.27	16 16.72	1 9.22	20 11 44.7
25	20 28 2.91	5.06	19 6 23.7	16.2	10.445	36.53	12 21.78	16 16.61	1 9.11	20 15 41.25
26	20 32 13.18	15.36	−18 51 36.6	28.7	10.411	+37.39	+12 35.47	16 16.50	1 9.00	20 19 37.8
27	20 36 22.63	24.84	18 36 28.8	20.7	10.377	38.24	12 48.38	16 16.38	1 8.89	20 23 34.3
28	20 40 31.26	33.50	18 20 61.0	52.5	10.343	39.07	13 0.45	16 16.26	1 8.78	20 27 30.9
29	20 44 39.07	41.34	18 5 13.4	4.6	10.308	39.89	13 11.69	16 16.14	1 8.66	20 31 27.4
30	20 48 46.06	48.35	17 48 66.4	57.4	10.274	40.69	13 22.12	16 16.01	1 8.54	20 35 24.04
31	20 52 52.22	54.53	−17 32 40.4	31.0	10.240	+41.48	+13 31.72	16 15.87	1 8.42	20 39 20.59
Feb. 1	20 56 57.57	59.90	17 15 55.6	46.0	10.206	42.25	13 40.50	16 15.73	1 8.30	20 43 17.15
2	21 1 2.11	4.45	16 58 52.6	42.7	10.172	43.00	13 48.48	16 15.58	1 8.19	20 47 13.70
3	21 5 5.84	8.19	16 41 31.7	21.5	10.139	43.74	13 55.64	16 15.43	1 8.07	20 51 10.26
4	21 9 8.76	11.13	16 23 53.3	42.9	10.105	44.46	14 2.00	16 15.27	1 7.96	20 55 6.8
5	21 13 10.88	13.26	−16 5 57.8	47.2	10.072	+45.16	+14 7.56	16 15.10	1 7.84	20 59 3.38
6	21 17 12.21	14.59	15 47 45.5	34.6	10.039	45.85	14 12.33	16 14.93	1 7.72	21 2 59.93
7	21 21 12.76	15.14	15 29 16.8	5.7	10.006	46.53	14 16.30	16 14.76	1 7.61	21 6 56.49
8	21 25 12.51	14.90	15 10 32.3	21.0	9.974	47.18	14 19.50	16 14.58	1 7.50	21 10 53.04
9	21 29 11.49	13.87	14 51 32.2	20.8	9.941	47.82	14 21.91	16 14.40	1 7.39	21 14 49.60
10	21 33 9.70	12.07	−14 32 17.0	5.5	9.909	+48.44	+14 23.55	16 14.22	1 7.28	21 18 46.16
11	21 37 7.13	9.50	14 12 47.2	35.5	9.877	49.04	14 24.43	16 14.03	1 7.17	21 22 42.71
12	21 41 3.80	6.17	13 52 63.2	51.3	9.845	49.63	14 24.53	16 13.84	1 7.06	21 26 39.27
13	21 44 59.71	62.07	13 32 65.3	53.3	9.814	50.19	14 23.88	16 13.65	1 6.95	21 30 35.82
14	21 48 54.87	57.21	13 12 54.2	42.0	9.783	50.73	14 22.48	16 13.46	1 6.84	21 34 32.38
15	21 52 49.28	51.61	−12 52 30.2	17.9	9.752	+51.26	+14 20.32	16 13.27	1 6.74	21 38 28.93
16	21 56 42.95	45.27	−12 31 53.7	41.4	9.721	+51.77	+14 17.43	16 13.08	1 6.63	21 42 25.49

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0ˢ.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Decli-nation.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
	21 56 42.95	45.27	−12 31 53.7	41.4	9.721	+51.77	+14 17.43	16 13.08	1 6.63	21 42 25.49
	22 0 35.89	38.19	12 10 65.3	52.9	9.691	52.26	14 13.81	16 12.88	1 6.53	21 46 22.04
	22 4 28.11	30.39	11 49 65.2	52.8	9.661	52.74	14 9.47	16 12.67	1 6.43	21 50 18.60
	22 8 19.62	21.88	11 28 54.1	41.6	9.632	53.19	14 4.42	16 12.46	1 6.33	21 54 15.15
	22 12 10.44	12.67	11 7 32.2	19.7	9.603	53.63	13 58.67	16 12.25	1 6.23	21 58 11.71
1	22 16 0.57	2.78	−10 45 60.1	47.6	9.575	+54.05	+13 52.24	16 12.04	1 6.13	22 2 8.26
2	22 19 50.03	52.22	10 24 18.1	5.6	9.547	54.45	13 45.14	16 11.83	1 6.04	22 6 4.82
3	22 23 38.84	41.00	10 2 26.6	14.2	9.520	54.84	13 37.39	16 11.61	1 5.95	22 10 1.37
4	22 27 27.01	29.15	9 40 26.1	13.7	9.494	55.21	13 29.01	16 11.39	1 5.86	22 13 57.93
5	22 31 14.56	16.67	9 18 17.0	4.6	9.469	55.56	13 20.00	16 11.16	1 5.77	22 17 54.48
6	22 35 1.51	3.58	− 8 55 59.6	47.3	9.444	+55.89	+13 10.39	16 10.94	1 5.69	22 21 51.04
7	22 38 47.88	49.92	8 33 34.3	22.1	9.420	56.21	13 0.20	16 10.71	1 5.61	22 25 47.59
8	22 42 33.68	35.69	8 10 61.5	49.4	9.397	56.52	12 49.44	16 10.48	1 5.53	22 29 44.14
1	22 46 18.94	20.92	7 48 21.5	9.6	9.375	56.81	12 38.14	16 10.24	1 5.46	22 33 40.70
2	22 50 3.68	5.62	7 25 34.8	23.0	9.354	57.08	12 26.33	16 10.00	1 5.39	22 37 37.25
3	22 53 47.93	49.83	− 7 2 41.8	30.0	9.334	+57.34	+12 14.01	16 9.75	1 5.32	22 41 33.81
4	22 57 31.70	33.56	6 39 42.7	31.1	9.314	57.58	12 1.22	16 9.50	1 5.25	22 45 30.36
5	23 1 15.02	16.84	6 16 37.9	26.5	9.295	57.81	11 47.99	16 9.25	1 5.18	22 49 26.92
6	23 4 57.90	59.69	5 53 27.8	16.6	9.278	58.02	11 34.32	16 8.99	1 5.12	22 53 23.47
7	23 8 40.38	42.12	5 30 12.7	1.7	9.262	58.23	11 20.24	16 8.73	1 5.06	22 57 20.02
8	23 12 22.47	24.17	− 5 6 53.0	42.3	9.246	+58.41	+11 5.78	16 8.47	1 5.00	23 1 16.58
9	23 16 4.19	5.86	4 43 29.3	18.7	9.231	58.57	10 50.95	16 8.21	1 4.94	23 5 13.13
10	23 19 45.56	47.19	4 19 61.7	51.4	9.217	58.72	10 35.77	16 7.95	1 4.88	23 9 9.68
11	23 23 26.60	28.19	3 56 30.7	20.6	9.203	58.86	10 20.25	16 7.68	1 4.83	23 13 6.24
12	23 27 7.32	8.87	3 32 56.8	46.8	9.190	58.97	10 4.42	16 7.41	1 4.78	23 17 2.79
13	23 30 47.75	49.25	− 3 9 20.2	10.5	9.178	+59.07	+ 9 48.30	16 7.13	1 4.73	23 20 59.34
14	23 34 27.90	29.36	2 45 41.4	32.0	9.167	59.16	9 31.90	16 6.87	1 4.69	23 24 55.90
15	23 38 7.79	9.20	2 21 60.9	51.8	9.157	59.22	9 15.23	16 6.60	1 4.65	23 28 52.45
16	23 41 47.43	48.80	1 58 19.1	10.2	9.147	59.27	8 58.32	16 6.34	1 4.62	23 32 49.01
17	23 45 26.84	28.17	1 34 36.2	27.6	9.138	59.30	8 41.18	16 6.07	1 4.59	23 36 45.56
18	23 49 6.04	7.32	− 1 10 52.7	44.4	9.129	+59.32	+ 8 23.83	16 5.80	1 4.56	23 40 42.11
19	23 52 45.04	46.28	0 47 9.1	1.1	9.121	59.32	8 6.28	16 5.54	1 4.54	23 44 38.67
20	23 56 23.88	25.06	− 0 23 25.6	17.9	9.114	59.30	7 48.56	16 5.27	1 4.52	23 48 35.22
21	0 0 2.55	3.69	+ 0 0 17.3	24.7	9.108	59.27	7 30.69	16 5.00	1 4.50	23 52 31.77
22	0 3 41.09	42.18	0 23 59.2	66.4	9.103	59.22	7 12.67	16 4.73	1 4.48	23 56 28.33
23	0 7 19.51	20.56	+ 0 47 39.9	46.8	9.099	+59.16	+ 6 54.54	16 4.46	1 4.47	0 0 24.88
24	0 10 57.83	58.83	1 11 18.9	25.5	9.095	59.09	6 36.31	16 4.19	1 4.46	0 4 21.44
25	0 14 36.07	37.02	1 34 56.0	62.2	9.092	59.00	6 18.00	16 3.92	1 4.45	0 8 17.99
26	0 18 14.25	15.15	1 58 30.7	36.6	9.090	58.89	5 59.63	16 3.65	1 4.44	0 12 14.54
27	0 21 52.40	53.25	2 22 2.6	8.2	9.089	58.77	5 41.23	16 3.37	1 4.44	0 16 11.10
28	0 25 30.53	31.34	+ 2 45 31.5	36.8	9.089	+58.64	+ 5 22.80	16 3.10	1 4.44	0 20 7.65
29	0 29 8.66	9.43	3 8 57.0	62.0	9.090	58.49	5 4.39	16 2.83	1 4.44	0 24 4.20
30	0 32 46.83	47.55	3 32 18.9	23.5	9.091	58.33	4 46.01	16 2.55	1 4.45	0 28 0.76
31	0 36 25.05	25.73	3 55 36.7	41.0	9.094	58.16	4 27.69	16 2.27	1 4.46	0 31 57.31
1	0 40 3.35	3.98	4 18 50.2	54.2	9.098	57.97	4 9.43	16 1.99	1 4.47	0 35 53.86
2	0 43 41.76	42.34	+ 4 41 59.1	62.8	9.103	+57.77	+ 3 51.29	16 1.71	1 4.49	0 39 50.42
3	0 47 20.29	20.82	+ 5 5 3.1	6.5	9.108	+57.56	+ 3 33.27	16 1.43	1 4.51	0 43 46.97

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Apr. 1	0 40 3.35	3.98	+ 4 18 50.2	54.2	9.098	+57.97	+4 9.43	16 1.99	1 4.47	0 35 53.86
2	0 43 41.76	42.34	4 41 59.1	62.8	9.103	57.77	3 51.29	16 1.71	1 4.49	0 39 50.41
3	0 47 20.29	20.82	5 5 3.1	6.5	9.108	57.56	3 33.27	16 1.43	1 4.51	0 43 46.97
4	0 50 58.97	59.46	5 28 1.7	4.9	9.114	57.33	3 15.40	16 1.15	1 4.53	0 47 43.52
5	0 54 37.81	38.26	5 50 54.8	57.6	9.122	57.09	2 57.69	16 0.87	1 4.55	0 51 40.08
6	0 58 16.85	17.25	+ 6 13 41.9	44.4	9.131	+56.83	+ 2 40.19	16 0.59	1 4.58	0 55 36.63
7	1 1 56.10	56.46	6 36 22.7	24.9	9.140	56.56	2 22.88	16 0.30	1 4.61	0 59 33.19
8	1 5 35.57	35.89	6 58 56.9	58.8	9.150	56.28	2 5.80	16 0.02	1 4.64	1 3 29.74
9	1 9 15.28	15.56	7 21 24.0	25.7	9.160	55.98	1 48.96	15 59.74	1 4.68	1 7 26.30
10	1 12 55.26	55.49	7 43 43.8	45.2	9.171	55.66	1 32.39	15 59.46	1 4.72	1 11 22.85
11	1 16 35.50	35.70	+ 8 5 55.9	57.0	9.183	+55.33	+1 16.09	15 59.18	1 4.76	1 15 19.41
12	1 20 16.04	16.19	8 27 59.8	60.7	9.195	54.99	1 0.07	15 58.91	1 4.80	1 19 15.96
13	1 23 56.88	56.99	8 49 55.3	56.0	9.208	54.63	0 44.36	15 58.64	1 4.84	1 23 12.52
14	1 27 38.03	38.11	9 11 42.0	42.4	9.222	54.25	0 28.96	15 58.37	1 4.89	1 27 9.08
15	1 31 19.51	19.55	9 33 19.4	19.6	9.236	53.86	+0 13.89	15 58.10	1 4.94	1 31 5.63
16	1 35 1.33	1.33	+ 9 54 47.3	47.3	9.250	+53.46	−0 0.84	15 57.83	1 4.99	1 35 2.19
17	1 38 43.51	43.47	10 16 5.2	5.1	9.265	53.04	0 15.22	15 57.56	1 5.04	1 38 58.74
18	1 42 26.05	25.97	10 37 13.0	12.7	9.280	52.61	0 29.23	15 57.30	1 5.10	1 42 55.30
19	1 46 8.96	8.85	10 58 10.2	9.7	9.296	52.16	0 42.87	15 57.04	1 5.16	1 46 51.85
20	1 49 52.26	52.12	11 18 56.5	55.7	9.312	51.70	0 56.12	15 56.79	1 5.22	1 50 48.41
21	1 53 35.96	35.79	+11 39 31.5	30.5	9.329	+51.22	−1 8.98	15 56.54	1 5.28	1 54 44.96
22	1 57 20.08	19.87	11 59 54.9	53.7	9.347	50.73	1 21.41	15 56.29	1 5.34	1 58 41.52
23	2 1 4.62	4.38	12 20 6.3	5.0	9.365	50.23	1 33.42	15 56.04	1 5.40	2 2 38.07
24	2 4 49.60	49.33	12 40 5.5	4.0	9.383	49.71	1 45.00	15 55.79	1 5.47	2 6 34.63
25	2 8 35.02	34.72	12 59 52.1	50.5	9.402	49.18	1 56.13	15 55.54	1 5.54	2 10 31.18
26	2 12 20.91	20.58	+13 19 25.9	24.2	9.422	+48.64	−2 6.80	15 55.29	1 5.61	2 14 27.74
27	2 16 7.27	6.91	13 38 46.6	44.7	9.442	48.08	2 16.99	15 55.04	1 5.68	2 18 24.30
28	2 19 54.12	53.73	13 57 53.7	51.7	9.462	47.51	2 26.70	15 54.80	1 5.75	2 22 20.85
29	2 23 41.47	41.06	14 16 47.1	45.0	9.483	46.93	2 35.90	15 54.55	1 5.83	2 26 17.41
30	2 27 29.34	28.90	14 35 26.4	24.3	9.505	46.34	2 44.59	15 54.31	1 5.91	2 30 13.96
May 1	2 31 17.73	17.27	+14 53 51.4	49.2	9.528	+45.74	−2 52.75	15 54.07	1 5.99	2 34 10.52
2	2 35 6.67	6.19	15 11 61.7	59.4	9.551	45.12	3 0.37	15 53.82	1 6.07	2 38 7.07
3	2 38 56.17	55.67	15 29 57.1	54.7	9.574	44.49	3 7.43	15 53.58	1 6.15	2 42 3.61
4	2 42 46.22	45.71	15 47 37.3	34.8	9.597	43.85	3 13.93	15 53.34	1 6.23	2 46 0.17
5	2 46 36.85	36.32	16 4 61.8	59.4	9.621	43.20	3 19.86	15 53.10	1 6.31	2 49 56.72
6	2 50 28.06	27.51	+16 22 10.5	8.1	9.646	+42.53	−3 25.21	15 52.86	1 6.39	2 53 53.28
7	2 54 19.85	19.28	16 39 3.0	0.6	9.670	41.85	3 29.98	15 52.63	1 6.47	2 57 49.83
8	2 58 12.22	11.64	16 55 38.9	36.5	9.694	41.15	3 34.16	15 52.41	1 6.55	3 1 46.39
9	3 2 5.18	4.59	17 11 58.0	55.6	9.719	40.44	3 37.76	15 52.19	1 6.63	3 5 42.95
10	3 5 58.72	58.13	17 27 60.0	57.5	9.743	39.72	3 40.77	15 51.97	1 6.72	3 9 39.50
11	3 9 52.85	52.25	+17 43 44.4	42.0	9.768	+38.99	−3 43.20	15 51.75	1 6.80	3 13 36.06
12	3 13 47.57	46.95	17 59 11.1	8.7	9.792	38.24	3 45.05	15 51.54	1 6.88	3 17 32.62
13	3 17 42.86	42.24	18 14 19.6	17.3	9.816	37.48	3 46.31	15 51.33	1 6.96	3 21 29.17
14	3 21 38.73	38.10	18 29 9.8	7.5	9.840	36.70	3 47.01	15 51.12	1 7.04	3 25 25.73
15	3 25 35.16	34.54	18 43 41.1	38.9	9.863	35.91	3 47.12	15 50.91	1 7.12	3 29 22.29
16	3 29 32.17	31.54	+18 57 53.6	51.4	9.887	+35.12	−3 46.67	15 50.71	1 7.20	3 33 18.84
17	3 33 29.73	29.11	+19 11 46.7	44.6	9.910	+34.31	−3 45.66	15 50.52	1 7.29	3 37 15.40

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
7	3 33 29.73	29.11	+19 11 46.7	44.6	9.910	+34.31	−3 45.66	15 50.52	1 7.29	3 37 15.40
8	3 37 27.86	27.24	19 25 20.3	18.3	9.933	33.49	3 44.10	15 50.33	1 7.37	3 41 11.96
9	3 41 26.52	25.91	19 38 34.1	32.2	9.956	32.66	3 42.00	15 50.15	1 7.45	3 45 8.51
0	3 45 25.72	25.11	19 51 27.8	26.0	9.978	31.82	3 39.36	15 49.97	1 7.53	3 49 5.07
1	3 49 25.45	24.85	20 3 61.2	59.4	10.000	30.97	3 36.18	15 49.79	1 7.60	3 53 1.63
2	3 53 25.70	25.11	+20 16 13.9	12.2	10.021	+30.10	−3 32.49	15 49.62	1 7.67	3 56 58.18
3	3 57 26.47	25.89	20 28 5.8	4.2	10.042	29.22	3 28.29	15 49.45	1 7.75	4 0 54.74
4	4 1 27.74	27.17	20 39 36.7	35.1	10.063	28.34	3 23.58	15 49.28	1 7.82	4 4 51.30
5	4 5 29.49	28.94	20 50 46.2	44.7	10.084	27.45	3 18.37	15 49.12	1 7.90	4 8 47.86
26	4 9 31.74	31.20	21 1 34.3	32.9	10.104	26.56	3 12.68	15 48.96	1 7.97	4 12 44.42
27	4 13 34.47	33.95	+21 11 60.8	59.4	10.124	+25.65	−3 6.51	15 48.80	1 8.04	4 16 40.97
28	4 17 37.67	37.17	21 22 5.3	3.9	10.143	24.73	2 59.87	15 48.64	1 8.11	4 20 37.53
29	4 21 41.34	40.85	21 31 47.7	46.4	10.162	23.80	2 52.76	15 48.49	1 8.17	4 24 34.09
30	4 25 45.47	45.00	21 41 7.7	6.6	10.181	22.87	2 45.19	15 48.34	1 8.23	4 28 30.65
31	4 29 50.05	49.60	21 50 5.3	4.3	10.200	21.93	2 37.18	15 48.19	1 8.29	4 32 27.20
1	4 33 55.06	54.64	+21 58 40.2	39.3	10.218	+20.98	−2 28.72	15 48.04	1 8.34	4 36 23.76
2	4 38 0.51	0.11	22 6 52.3	51.5	10.236	20.02	2 19.83	15 47.89	1 8.40	4 40 20.32
3	4 42 6.37	6.00	22 14 41.2	40.6	10.253	19.06	2 10.53	15 47.75	1 8.46	4 44 16.88
4	4 46 12.63	12.28	22 22 7.0	6.4	10.269	18.09	2 0.83	15 47.61	1 8.51	4 48 13.44
5	4 50 19.26	18.95	22 29 9.3	8.8	10.284	17.11	1 50.75	15 47.47	1 8.56	4 52 9.99
6	4 54 26.26	25.97	+22 35 48.1	47.6	10.299	+16.12	−1 40.31	15 47.34	1 8.61	4 56 6.55
7	4 58 33.60	33.34	22 42 3.2	2.7	10.313	15.13	1 29.52	15 47.22	1 8.65	5 0 3.11
8	5 2 41.26	41.03	22 47 54.4	54.0	10.325	14.13	1 18.42	15 47.11	1 8.69	5 3 59.67
9	5 6 49.21	49.02	22 53 21.5	21.3	10.337	13.13	1 7.02	15 47.00	1 8.73	5 7 56.23
10	5 10 57.44	57.28	22 58 24.5	24.3	10.348	12.12	0 55.35	15 46.89	1 8.77	5 11 52.78
11	5 15 5.92	5.79	+23 3 3.3	3.1	10.358	+11.11	−0 43.43	15 46.78	1 8.80	5 15 49.34
12	5 19 14.62	14.53	23 7 17.7	17.5	10.367	10.09	0 31.29	15 46.68	1 8.83	5 19 45.90
13	5 23 23.53	23.47	23 11 7.6	7.5	10.375	9.07	0 18.94	15 46.59	1 8.85	5 23 42.46
14	5 27 32.60	32.58	23 14 32.9	32.9	10.382	8.05	−0 6.42	15 46.50	1 8.87	5 27 39.02
15	5 31 41.82	41.84	23 17 33.7	33.7	10.387	7.02	+0 6.25	15 46.41	1 8.89	5 31 35.58
16	5 35 51.17	51.22	+23 20 9.8	9.8	10.391	+ 5.99	+0 19.03	15 46.33	1 8.91	5 35 32.14
17	5 40 0.61	0.70	23 22 21.2	21.2	10.395	4.96	0 31.92	15 46.27	1 8.92	5 39 28.69
18	5 44 10.12	10.24	23 24 7.8	7.8	10.397	3.93	0 44.87	15 46.20	1 8.93	5 43 25.25
19	5 48 19.67	19.83	23 25 29.7	29.7	10.398	2.90	0 57.86	15 46.14	1 8.94	5 47 21.81
20	5 52 29.23	29.44	23 26 26.8	26.8	10.399	1.87	1 10.87	15 46.08	1 8.95	5 51 18.37
21	5 56 38.79	39.03	+23 26 59.1	59.1	10.398	+ 0.83	+1 23.88	15 46.03	1 8.95	5 55 14.93
22	6 0 48.32	48.60	23 27 6.6	6.6	10.396	− 0.20	1 36.85	15 45.98	1 8.95	5 59 11.49
23	6 4 57.80	58.11	23 26 49.4	49.4	10.393	1.23	1 49.77	15 45.93	1 8.94	6 3 8.04
24	6 9 7.20	7.55	23 26 7.5	7.4	10.390	2.26	2 2.61	15 45.89	1 8.93	6 7 4.60
25	6 13 16.51	16.89	23 25 0.8	0.7	10.386	3.29	2 15.36	15 45.85	1 8.92	6 11 1.16
26	6 17 25.70	26.12	+23 23 29.4	29.3	10.381	− 4.32	+2 28.00	15 45.82	1 8.91	6 14 57.72
27	6 21 34.76	35.22	23 21 33.4	33.2	10.375	5.35	2 40.51	15 45.79	1 8.89	6 18 54.28
28	6 25 43.68	44.18	23 19 12.9	12.6	10.369	6.37	2 52.87	15 45.76	1 8.86	6 22 50.84
29	6 29 52.44	52.97	23 16 27.8	27.4	10.362	7.39	3 5.07	15 45.73	1 8.83	6 26 47.40
30	6 34 1.01	1.58	23 13 18.2	17.7	10.353	8.41	3 17.08	15 45.71	1 8.80	6 30 43.95
uly 1	6 38 9.38	9.98	+23 9 44.2	43.6	10.344	− 9.43	+3 28.89	15 45.69	1 8.77	6 34 40.51
2	6 42 17.53	18.16	+23 5 45.8	45.2	10.335	−10.44	+3 40.49	15 45.67	1 8.74	6 38 37.07

Note.—For mean time interval of semidiameter passing meridian, subtract 0^s.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
July 1	6 38 9.38	9.98	+23 9 44.2	43.6	10.344	− 9.43	+3 28.89	15 45.69	1 8.77	6 34 40.5
2	6 42 17.53	18.16	23 5 45.8	45.2	10.335	10.44	3 40.49	15 45.67	1 8.74	6 38 37.07
3	6 46 25.43	26.10	23 1 23.3	22.5	10.324	11.45	3 51.84	15 45.66	1 8.70	6 42 33.6
4	6 50 33.08	33.78	22 56 36.6	35.7	10.313	12.45	4 2.93	15 45.65	1 8.66	6 46 30.19
5	6 54 40.44	41.17	22 51 25.8	24.8	10.301	13.45	4 13.73	15 45.64	1 8.62	6 50 26.74
6	6 58 47.50	48.25	+22 45 51.1	50.1	10.287	−14.44	+ 4 24.22	15 45.64	1 8.57	6 54 23.3
7	7 2 54.22	55.00	22 39 52.7	51.6	10.273	15.43	4 34.39	15 45.65	1 8.52	6 58 19.8
8	7 7 0.59	1.40	22 33 30.6	29.4	10.258	16.41	4 44.21	15 45.66	1 8.47	7 2 16.4
9	7 11 6.61	7.44	22 26 45.0	43.7	10.242	17.38	4 53.66	15 45.68	1 8.41	7 6 12.9
10	7 15 12.23	13.09	22 19 36.2	34.7	10.226	18.35	5 2.72	15 45.70	1 8.35	7 10 9.5
11	7 19 17.44	18.32	+22 12 4.2	2.5	10.208	−19.31	+5 11.37	15 45.73	1 8.29	7 14 6.0
12	7 23 22.22	23.12	22 4 9.2	7.4	10.190	20.27	5 19.59	15 45.76	1 8.23	7 18 2.6
13	7 27 26.55	27.47	21 55 51.4	49.5	10.171	21.22	5 27.36	15 45.80	1 8.17	7 21 59.2
14	7 31 30.40	31.35	21 47 11.1	9.0	10.151	22.15	5 34.66	15 45.85	1 8.10	7 25 55.7
15	7 35 33.78	34.74	21 38 8.4	6.2	10.130	23.07	5 41.48	15 45.90	1 8.03	7 29 52.3
16	7 39 36.64	37.62	+21 28 43.6	41.3	10.109	−23.99	+5 47.79	15 45.95	1 7.96	7 33 48.8
17	7 43 38.99	39.98	21 18 57.0	54.5	10.087	24.90	5 53.57	15 46.01	1 7.89	7 37 45.4
18	7 47 40.80	41.80	21 8 48.7	46.1	10.065	25.79	5 58.82	15 46.08	1 7.82	7 41 42.0
19	7 51 42.06	43.07	20 58 19.0	16.2	10.041	26.68	6 3.52	15 46.15	1 7.75	7 45 38.5
20	7 55 42.75	43.78	20 47 28.0	25.2	10.017	27.56	6 7.66	15 46.23	1 7.67	7 49 35.11
21	7 59 42.88	43.92	+20 36 16.2	13.3	9.993	−28.43	+6 11.23	15 46.31	1 7.59	7 53 31.6
22	8 3 42.44	43.48	20 24 43.7	40.7	9.969	29.28	6 14.23	15 46.39	1 7.51	7 57 28.2
23	8 7 41.41	42.45	20 12 50.7	47.6	9.945	30.13	6 16.64	15 46.48	1 7.43	8 1 24.7
24	8 11 39.79	40.83	20 0 37.5	34.3	9.920	30.97	6 18.46	15 46.57	1 7.35	8 5 21.3
25	8 15 37.58	38.63	19 48 4.3	1.0	9.896	31.79	6 19.69	15 46.66	1 7.26	8 9 17.9
26	8 19 34.79	35.84	+19 35 11.5	8.0	9.871	−32.61	+6 20.33	15 46.75	1 7.18	8 13 14.4
27	8 23 31.40	32.45	19 21 59.1	55.6	9.847	33.42	6 20.38	15 46.85	1 7.09	8 17 11.01
28	8 27 27.42	28.46	19 8 27.5	23.9	9.822	34.21	6 19.84	15 46.95	1 7.01	8 21 7.5
29	8 31 22.85	23.88	18 54 36.9	33.2	9.797	35.00	6 18.72	15 47.05	1 6.92	8 25 4.1
30	8 35 17.70	18.72	18 40 27.5	23.8	9.773	35.78	6 17.00	15 47.16	1 6.83	8 29 0.6
31	8 39 11.95	12.96	+18 25 59.6	55.9	9.748	−36.54	+6 14.70	15 47.27	1 6.74	8 32 57.2
Aug. 1	8 43 5.62	6.62	18 11 13.5	9.7	9.724	37.30	6 11.81	15 47.39	1 6.66	8 36 53.8
2	8 46 58.70	59.69	17 56 9.5	5.6	9.699	38.04	6 8.33	15 47.51	1 6.57	8 40 50.3
3	8 50 51.19	52.17	17 40 47.9	43.9	9.675	38.77	6 4.26	15 47.63	1 6.49	8 44 46.9
4	8 54 43.10	44.06	17 25 8.8	4.9	9.651	39.48	5 59.61	15 47.75	1 6.40	8 48 43.4
5	8 58 34.41	35.36	+17 9 12.8	8.8	9.626	−40.19	+5 54.37	15 47.88	1 6.31	8 52 40.0
6	9 2 25.14	26.07	16 52 59.9	55.9	9.602	40.88	5 48.54	15 48.02	1 6.22	8 56 36.5
7	9 6 15.29	16.20	16 36 30.6	26.6	9.577	41.56	5 42.13	15 48.16	1 6.13	9 0 33.1
8	9 10 4.86	5.74	16 19 45.0	41.1	9.553	42.23	5 35.14	15 48.30	1 6.05	9 4 29.6
9	9 13 53.84	54.71	16 2 43.7	39.8	9.529	42.88	5 27.57	15 48.45	1 5.96	9 8 26.2
10	9 17 42.25	43.09	+15 45 26.8	23.0	9.505	−43.52	+5 19.41	15 48.60	1 5.88	9 12 22.80
11	9 21 30.08	30.89	15 27 54.8	51.0	9.481	44.15	5 10.69	15 48.75	1 5.79	9 16 19.36
12	9 25 17.33	18.13	15 10 7.9	4.2	9.457	44.76	5 1.39	15 48.92	1 5.71	9 20 15.9
13	9 29 4.02	4.79	14 52 6.4	2.8	9.434	45.36	4 51.52	15 49.09	1 5.63	9 24 12.47
14	9 32 50.15	50.89	14 33 50.9	47.3	9.410	45.94	4 41.09	15 49.27	1 5.55	9 28 9.03
15	9 36 35.71	36.42	+14 15 21.4	17.9	9.387	−46.51	+4 30.10	15 49.45	1 5.47	9 32 5.58
16	9 40 20.72	21.40	+13 56 38.5	35.0	9.364	−47.07	+4 18.55	15 49.63	1 5.40	9 36 2.14

NOTE.—For mean time interval of semidiameter passing meridian, subtract 0s.19 from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
6	9 40 20.72	21.40	+13 56 38.5	35.0	9.364	−47.07	+ 4 18.55	15 49.63	1 5.40	9 36 2.14
7	9 44 5.19	5.83	13 37 42.3	39.0	9.341	47.61	4 6.46	15 49.82	1 5.33	9 39 58.69
8	9 47 49.12	49.72	13 18 33.3	30.2	9.319	48.14	3 53.84	15 50.01	1 5.26	9 43 55.25
9	9 51 32.52	33.09	12 59 11.8	8.8	9.298	48.65	3 40.69	15 50.20	1 5.18	9 47 51.80
0	9 55 15.42	15.95	12 39 38.0	35.2	9.277	49.15	3 27.03	15 50.39	1 5.11	9 51 48.36
1	9 58 57.81	58.31	+12 19 52.3	49.6	9.256	−49.65	+ 3 12.86	15 50.59	1 5.04	9 55 44.91
2	10 2 39.72	40.18	11 59 55.0	52.4	9.236	50.13	2 58.22	15 50.79	1 4.98	9 59 41.47
3	10 6 21.17	21.58	11 39 46.3	43.9	9.217	50.60	2 43.12	15 50.99	1 4.91	10 3 38.02
4	10 10 2.17	2.54	11 19 26.5	24.4	9.199	51.05	2 27.56	15 51.19	1 4.85	10 7 34.58
5	10 13 42.73	43.06	10 58 56.0	54.2	9.181	51.49	2 11.57	15 51.40	1 4.78	10 11 31.13
6	10 17 22.88	23.17	+10 38 15.1	13.5	9.164	−51.92	+ 1 55.17	15 51.61	1 4.72	10 15 27.69
7	10 21 2.63	2.88	10 17 24.0	22.6	9.148	52.34	1 38.37	15 51.82	1 4.66	10 19 24.24
8	10 24 42.01	42.21	9 56 23.0	21.7	9.133	52.75	1 21.19	15 52.03	1 4.60	10 23 20.80
9	10 28 21.03	21.19	9 35 12.4	11.4	9.119	53.14	1 3.66	15 52.24	1 4.54	10 27 17.35
0	10 31 59.71	59.83	9 13 52.4	51.7	9.105	53.52	0 45.79	15 52.46	1 4.49	10 31 13.90
31	10 35 38.06	38.13	+ 8 52 23.6	23.1	9.091	−53.88	+ 0 27.60	15 52.68	1 4.44	10 35 10.46
1	10 39 16.10	16.12	8 30 46.0	45.9	9.079	54.24	+ 0 9.09	15 52.90	1 4.39	10 39 7.01
2	10 42 53.85	53.82	8 9 0.2	0.4	9.067	54.58	− 0 9.72	15 53.12	1 4.35	10 43 3.57
3	10 46 31.33	31.25	7 47 6.4	6.8	9.056	54.90	0 28.79	15 53.34	1 4.31	10 47 0.12
4	10 50 8.54	8.42	7 25 4.9	5.6	9.045	55.21	0 48.13	15 53.57	1 4.27	10 50 56.67
5	10 53 45.51	45.34	+ 7 2 56.1	57.1	9.035	−55.51	− 1 7.71	15 53.80	1 4.23	10 54 53.23
6	10 57 22.26	22.04	6 40 40.2	41.6	9.026	55.80	1 27.51	15 54.04	1 4.20	10 58 49.78
7	11 0 58.79	58.52	6 18 17.8	19.4	9.018	56.07	1 47.52	15 54.28	1 4.17	11 2 46.34
8	11 4 35.13	34.81	5 55 49.0	50.9	9.010	56.32	2 7.73	15 54.52	1 4.14	11 6 42.89
9	11 8 11.29	10.92	5 33 14.3	16.6	9.003	56.56	2 28.12	15 54.76	1 4.11	11 10 39.44
10	11 11 47.28	46.86	+ 5 10 34.0	36.7	8.996	−56.79	− 2 48.68	15 55.01	1 4.09	11 14 36.00
11	11 15 23.12	22.65	4 47 48.5	51.5	8.990	57.00	3 9.39	15 55.27	1 4.07	11 18 32.55
12	11 18 58.83	58.30	4 24 58.1	61.4	8.985	57.20	3 30.23	15 55.53	1 4.05	11 22 29.11
13	11 22 34.42	33.84	4 2 3.1	6.9	8.980	57.38	3 51.19	15 55.79	1 4.04	11 26 25.66
14	11 26 9.90	9.27	3 39 4.1	8.2	8.976	57.54	4 12.25	15 56.05	1 4.03	11 30 22.21
15	11 29 45.30	44.61	+ 3 16 1.3	5.7	8.973	−57.69	− 4 33.40	15 56.31	1 4.02	11 34 18.77
16	11 33 20.63	19.89	2 52 54.9	59.7	8.971	57.83	4 54.62	15 56.57	1 4.01	11 38 15.32
17	11 36 55.91	55.12	2 29 45.4	50.5	8.970	57.96	5 15.89	15 56.84	1 4.01	11 42 11.87
18	11 40 31.16	30.32	2 6 33.1	38.6	8.969	58.07	5 37.18	15 57.11	1 4.01	11 46 8.43
19	11 44 6.41	5.52	1 43 18.3	24.1	8.969	58.16	5 58.48	15 57.37	1 4.01	11 50 4.98
20	11 47 41.68	40.73	+ 1 20 1.3	7.4	8.970	−58.25	− 6 19.76	15 57.64	1 4.02	11 54 1.53
21	11 51 16.99	15.99	0 56 42.4	48.9	8.972	58.32	6 41.00	15 57.91	1 4.03	11 57 58.09
22	11 54 52.37	51.32	0 33 21.9	28.8	8.976	58.38	7 2.17	15 58.18	1 4.04	12 1 54.64
23	11 58 27.83	26.73	+ 0 10 0.2	7.4	8.980	58.43	7 23.25	15 58.46	1 4.06	12 5 51.19
24	12 2 3.41	2.25	− 0 13 22.5	15.0	8.985	58.46	7 44.22	15 58.73	1 4.08	12 9 47.75
25	12 5 39.12	37.91	− 0 36 45.9	38.0	8.991	−58.48	− 8 5.06	15 59.00	1 4.10	12 13 44.30
26	12 9 15.00	13.73	1 0 9.6	1.4	8.998	58.49	8 25.73	15 59.27	1 4.12	12 17 40.85
27	12 12 51.06	49.74	1 23 33.3	24.8	9.007	58.48	8 46.22	15 59.53	1 4.15	12 21 37.41
28	12 16 27.32	25.96	1 46 56.7	47.8	9.016	58.46	9 6.51	15 59.80	1 4.18	12 25 33.96
29	12 20 3.82	2.40	2 10 19.4	10.1	9.026	58.43	9 26.57	16 0.07	1 4.21	12 29 30.51
30	12 23 40.56	39.09	− 2 33 41.1	31.5	9.037	−58.38	− 9 46.38	16 0.34	1 4.24	12 33 27.07
t. 1	12 27 17.57	16.05	− 2 56 61.4	51.5	9.048	−58.31	−10 5.91	16 0.61	1 4.28	12 37 23.62

Note.—For mean time interval of semidiameter passing meridian, subtract $0^{s}.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

Date.	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
Oct. 1	12 27 17.57	16.05	− 2 56 61.4	51.5	9.048	−58.31	−10 5.91	16 0.61	1 4.28	12 37 23.68
2	12 30 54.88	53.30	3 20 19.9	9.8	9.061	58.23	10 25.15	16 0.88	1 4.32	12 41 20.17
3	12 34 32.50	30.87	3 43 36.4	26.0	9.074	58.14	10 44.08	16 1.15	1 4.37	12 45 16.73
4	12 38 10.45	8.78	4 6 50.5	39.8	9.089	58.03	11 2.68	16 1.42	1 4.42	12 49 13.28
5	12 41 48.76	47.04	4 29 61.7	50.7	9.104	57.90	11 20.93	16 1.69	1 4.47	12 53 9.84
6	12 45 27.43	25.66	− 4 52 69.7	58.5	9.119	−57.76	−11 38.81	16 1.96	1 4.52	12 57 6.39
7	12 49 6.49	4.67	5 16 14.1	2.7	9.136	57.61	11 56.30	16 2.24	1 4.58	13 1 2.94
8	12 52 45.96	44.09	5 39 14.6	2.9	9.153	57.43	12 13.39	16 2.52	1 4.64	13 4 59.50
9	12 56 25.84	23.93	6 1 70.6	58.7	9.171	57.24	12 30.06	16 2.79	1 4.70	13 8 56.05
10	13 0 6.16	4.20	6 24 61.9	49.7	9.189	57.03	12 46.30	16 3.07	1 4.77	13 12 52.60
11	13 3 46.92	44.92	− 6 47 47.9	35.6	9.208	−56.80	−13 2.09	16 3.35	1 4.84	13 16 49.16
12	13 7 28.15	26.11	7 10 28.4	15.9	9.228	56.56	13 17.42	16 3.63	1 4.91	13 20 45.71
13	13 11 9.86	7.77	7 32 62.9	50.3	9.248	56.31	13 32.27	16 3.91	1 4.99	13 24 42.26
14	13 14 52.06	49.93	7 55 31.1	18.3	9.269	56.04	13 46.62	16 4.19	1 5.07	13 28 38.82
15	13 18 34.78	32.61	8 17 52.6	39.5	9.291	55.75	14 0.46	16 4.47	1 5.15	13 32 35.37
16	13 22 18.02	15.82	− 8 39 66.8	53.7	9.313	−55.44	−14 13.78	16 4.76	1 5.23	13 36 31.93
17	13 25 61.81	59.57	9 2 13.6	0.4	9.336	55.12	14 26.54	16 5.05	1 5.31	13 40 28.48
18	13 29 46.17	43.89	9 23 72.6	59.2	9.360	54.79	14 38.74	16 5.33	1 5.40	13 44 25.04
19	13 33 31.12	28.80	9 45 63.3	49.9	9.385	54.44	14 50.35	16 5.60	1 5.49	13 48 21.59
20	13 37 16.67	14.31	10 7 45.5	32.0	9.411	54.07	15 1.36	16 5.87	1 5.58	13 52 18.14
21	13 41 2.85	0.45	−10 29 18.8	5.2	9.437	−53.69	−15 11.74	16 6.14	1 5.67	13 56 14.70
22	13 44 49.67	47.24	10 50 42.8	29.1	9.465	53.30	15 21.48	16 6.41	1 5.77	14 0 11.25
23	13 48 37.16	34.69	11 11 57.0	43.4	9.493	52.89	15 30.56	16 6.68	1 5.87	14 4 7.81
24	13 52 25.32	22.83	11 32 61.2	47.6	9.522	52.46	15 38.95	16 6.94	1 5.97	14 8 4.36
25	13 56 14.20	11.68	11 53 55.1	41.4	9.551	52.02	15 46.64	16 7.20	1 6.07	14 12 0.92
26	14 0 3.78	1.24	−12 14 38.1	24.4	9.581	−51.56	−15 53.62	16 7.47	1 6.17	14 15 57.47
27	14 3 54.10	51.54	12 34 69.8	56.3	9.612	51.08	15 59.86	16 7.73	1 6.27	14 19 54.03
28	14 7 45.18	42.59	12 55 30.0	16.5	9.644	50.59	16 5.35	16 7.98	1 6.38	14 23 50.58
29	14 11 37.01	34.40	13 15 38.2	24.7	9.676	50.09	16 10.08	16 8.23	1 6.49	14 27 47.14
30	14 15 29.63	27.00	13 35 34.0	20.6	9.709	49.56	16 14.03	16 8.48	1 6.60	14 31 43.69
31	14 19 23.03	20.38	−13 55 17.0	3.7	9.742	−49.02	−16 17.19	16 8.72	1 6.71	14 35 40.25
Nov. 1	14 23 17.23	14.57	14 14 46.8	33.6	9.775	48.46	16 19.55	16 8.97	1 6.83	14 39 36.80
2	14 27 12.25	9.58	14 33 62.9	49.9	9.809	47.88	16 21.09	16 9.22	1 6.95	14 43 33.36
3	14 31 8.08	5.40	14 52 65.0	52.1	9.844	47.29	16 21.83	16 9.46	1 7.06	14 47 29.91
4	14 35 4.74	2.05	15 11 52.5	39.8	9.878	46.68	16 21.73	16 9.70	1 7.18	14 51 26.47
5	14 38 62.23	59.54	−15 30 25.2	12.6	9.913	−46.05	−16 20.80	16 9.94	1 7.29	14 55 23.02
6	14 42 60.56	57.86	15 48 42.6	30.2	9.948	45.40	16 19.04	16 10.18	1 7.41	14 59 19.58
7	14 46 59.73	57.02	16 6 44.2	32.0	9.983	44.73	16 16.44	16 10.42	1 7.53	15 3 16.14
8	14 50 59.73	57.02	16 24 29.5	17.6	10.017	44.04	16 13.00	16 10.66	1 7.65	15 7 12.69
9	14 54 60.57	57.86	16 41 58.2	46.5	10.052	43.34	16 8.73	16 10.89	1 7.77	15 11 9.25
10	14 58 62.24	59.54	−16 58 69.9	58.4	10.087	−42.62	−16 3.63	16 11.13	1 7.89	15 15 5.80
11	15 3 4.74	2.05	17 15 64.0	52.9	10.121	41.89	15 57.69	16 11.36	1 8.01	15 19 2.36
12	15 7 8.07	5.39	17 32 40.4	29.5	10.156	41.14	15 50.92	16 11.59	1 8.13	15 22 58.91
13	15 11 12.23	9.57	17 48 58.4	47.8	10.191	40.37	15 43.32	16 11.82	1 8.25	15 26 55.46
14	15 15 17.23	14.57	18 4 57.8	47.5	10.225	39.58	15 34.90	16 12.05	1 8.37	15 30 52.03
15	15 19 23.04	20.41	−18 20 38.2	28.2	10.260	−38.78	−15 25.65	16 12.27	1 8.49	15 34 48.59
16	15 23 29.69	27.07	−18 35 59.2	49.6	10.294	−37.96	−15 15.57	16 12.49	1 8.61	15 38 45.15

TE.—For mean time interval of semidiameter passing meridian, subtract $0^s.18$ from the sidereal interval.

FOR WASHINGTON MEAN AND APPARENT NOON.

	Apparent Right Ascension.		Apparent Declination.		Hourly Motion.		Equation of Time for Apparent Noon.	Semi-diameter at Apparent Noon.	Sidereal Time of Semid. Passing Merid.	Sidereal Time of Mean Noon.
	Mean Noon.	App. Noon.	Mean Noon.	App. Noon.	Right Ascen.	Declination.				
	h m s	s	° ′ ″	″	s	″	m s	′ ″	m s	h m s
6	15 23 29.69	27.07	−18 35 59.2	49.6	10.294	−37.96	−15 15.57	16 12.49	1 8.61	15 38 45.15
7	15 27 37.16	34.56	18 50 60.4	51.1	10.328	37.13	15 4.66	16 12.70	1 8.73	15 42 41.70
18	15 31 45.46	42.88	19 5 41.5	32.5	10.363	36.28	14 52.93	16 12.91	1 8.85	15 46 38.26
19	15 35 54.57	52.03	19 19 62.1	53.4	10.397	35.42	14 40.38	16 13.12	1 8.96	15 50 34.82
20	15 40 4.50	1.99	19 33 61.8	53.4	10.431	34.55	14 27.01	16 13.32	1 9.07	15 54 31.37
21	15 44 15.25	12.77	−19 47 40.3	32.3	10.465	−33.66	−14 12.82	16 13.52	1 9.18	15 58 27.93
22	15 48 26.80	24.36	20 0 57.2	49.6	10.498	32.75	13 57.83	16 13.71	1 9.29	16 2 24.49
23	15 52 39.16	36.76	20 13 52.2	44.9	10.531	31.83	13 42.04	16 13.90	1 9.40	16 6 21.05
24	15 56 52.31	49.95	20 26 24.9	18.0	10.564	30.89	13 25.45	16 14.08	1 9.50	16 10 17.60
25	16 1 6.24	3.92	20 38 35.0	28.4	10.597	29.94	13 8.08	16 14.26	1 9.61	16 14 14.16
26	16 5 20.95	18.68	−20 50 22.1	15.9	10.629	−28.98	−12 49.94	16 14.44	1 9.71	16 18 10.72
27	16 9 36.41	34.20	21 1 45.9	40.1	10.660	28.00	12 31.03	16 14.61	1 9.82	16 22 7.28
28	16 13 52.63	50.47	21 12 46.1	40.6	10.691	27.01	12 11.37	16 14.77	1 9.92	16 26 3.84
29	16 18 9.59	7.47	21 23 22.3	17.2	10.721	26.01	11 50.98	16 14.93	1 10.02	16 30 0.39
30	16 22 27.26	25.19	21 33 34.3	29.5	10.751	24.99	11 29.87	16 15.08	1 10.11	16 33 56.95
1	16 26 45.62	43.62	−21 43 21.7	17.2	10.779	−23.96	−11 8.06	16 15.23	1 10.20	16 37 53.51
2	16 31 4.66	2.73	21 52 44.1	39.8	10.807	22.91	10 45.57	16 15.38	1 10.28	16 41 50.07
3	16 35 24.36	22.49	22 1 41.4	37.4	10.834	21.86	10 22.43	16 15.53	1 10.37	16 45 46.62
4	16 39 44.69	42.88	22 10 13.1	9.6	10.860	20.79	9 58.66	16 15.67	1 10.45	16 49 43.18
5	16 44 5.62	3.88	22 18 19.1	16.0	10.884	19.71	9 34.29	16 15.81	1 10.53	16 53 39.74
6	16 48 27.12	25.45	−22 25 59.1	56.3	10.907	−18.62	− 9 9.34	16 15.95	1 10.60	16 57 36.30
7	16 52 49.16	47.57	22 33 12.9	10.4	10.929	17.52	8 43.85	16 16.08	1 10.67	17 1 32.86
8	16 57 11.71	10.20	22 39 60.1	57.9	10.950	16.41	8 17.86	16 16.21	1 10.74	17 5 29.42
9	17 1 34.74	33.30	22 46 20.7	18.6	10.969	15.29	7 51.38	16 16.34	1 10.81	17 9 25.98
10	17 5 58.21	56.85	22 52 14.2	12.5	10.987	14.17	7 24.46	16 16.46	1 10.87	17 13 22.53
11	17 10 22.09	20.82	−22 57 40.7	39.2	11.003	−13.04	− 6 57.13	16 16.57	1 10.93	17 17 19.09
12	17 14 46.35	45.16	23 2 40.0	38.7	11.018	11.90	6 29.43	16 16.68	1 10.98	17 21 15.65
13	17 19 10.96	9.85	23 7 11.8	10.7	11.032	10.76	6 1.37	16 16.79	1 11.03	17 25 12.21
14	17 23 35.88	34.86	23 11 16.0	15.2	11.045	9.60	5 33.00	16 16.90	1 11.07	17 29 8.77
15	17 28 1.09	0.16	23 14 52.6	51.9	11.056	8.44	5 4.34	16 17.01	1 11.11	17 33 5.33
16	17 32 26.56	25.71	−23 18 1.3	0.8	11.066	− 7.28	− 4 35.42	16 17.11	1 11.14	17 37 1.89
17	17 36 52.25	51.49	23 20 42.2	41.8	11.075	6.12	4 6.28	16 17.20	1 11.16	17 40 58.44
18	17 41 18.14	17.47	23 22 55.0	54.8	11.082	4.95	3 36.93	16 17.28	1 11.18	17 44 55.00
19	17 45 44.20	43.62	23 24 39.9	39.7	11.088	3.78	3 7.43	16 17.36	1 11.21	17 48 51.56
20	17 50 10.38	9.90	23 25 56.5	56.4	11.093	2.61	2 37.79	16 17.43	1 11.23	17 52 48.12
21	17 54 36.68	36.29	−23 26 45.0	45.0	11.097	− 1.43	− 2 8.04	16 17.49	1 11.25	17 56 44.68
22	17 59 3.05	2.75	23 27 5.3	5.3	11.100	− 0.26	1 38.22	16 17.55	1 11.26	18 0 41.24
23	18 3 29.46	29.25	23 26 57.3	57.3	11.101	+ 0.92	1 8.36	16 17.61	1 11.26	18 4 37.80
24	18 7 55.88	55.76	23 26 21.1	21.1	11.101	2.10	0 38.49	16 17.66	1 11.26	18 8 34.36
25	18 12 22.28	22.26	23 25 16.6	16.6	11.099	3.28	− 0 8.64	16 17.70	1 11.25	18 12 30.91
26	18 16 48.64	48.70	−23 23 43.8	43.8	11.097	+ 4.45	+ 0 21.16	16 17.74	1 11.24	18 16 27.47
27	18 21 14.90	15.06	23 21 42.9	42.8	11.093	5.63	0 50.89	16 17.77	1 11.23	18 20 24.03
28	18 25 41.06	41.31	23 19 13.7	13.6	11.087	6.80	1 20.50	16 17.79	1 11.21	18 24 20.59
29	18 30 7.08	7.42	23 16 16.4	16.2	11.080	7.97	1 49.96	16 17.81	1 11.18	18 28 17.15
30	18 34 32.92	33.35	23 12 51.1	50.8	11.072	9.14	2 19.25	16 17.82	1 11.15	18 32 13.71
31	18 38 58.54	59.06	−23 8 57.8	57.4	11.063	+10.30	+ 2 48.33	16 17.83	1 11.12	18 36 10.27
32	18 43 23.92	24.52	−23 4 36.7	36.1	11.052	+11.46	+ 3 17.16	16 17.84	1 11.08	18 40 6.83

NOTE.—For mean time interval of semidiameter passing meridian, subtract $0^s.19$ from the sidereal interval.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Jan. 0	U	11 48.65	2.240	6 27 42.73	144.60	+27 17 41.6	−201.0	70.71	15 6.2	55 20.1	I. N.
1	L	0 15.44	2.223	6 56 32.85	143.60	26 26 13.1	313.2	70.46	15 10.1	55 34.1	*I.* II. N.
1	U	12 41.95	2.193	7 25 5.78	141.77	25 12 41.8	421.1	70.00	15 14.0	55 48.5	II. N.
2	L	1 8.02	2.152	7 53 12.96	139.34	23 38 12.9	522.5	69.39	15 18.0	56 3.2	II. N.
2	U	13 33.57	2.106	8 20 48.54	136.55	+21 44 14.8	−615.7	68.69	15 22.1	56 18.1	II. N.
3	L	1 58.55	2.057	8 47 49.59	133.63	19 32 32.5	699.6	67.95	15 26.1	56 33.1	II.
3	U	14 22.95	2.010	9 14 16.04	130.81	17 5 3.0	773.5	67.23	15 30.2	56 48.2	II.
4	L	2 46.82	1.969	9 40 10.43	128.30	14 23 49.9	836.9	66.60	15 34.3	57 3.2	II.
4	U	15 10.24	1.935	10 5 37.38	126.27	+11 31 0.2	−889.6	66.08	15 38.4	57 18.2	II.
5	L	3 33.30	1.911	10 30 43.34	124.84	8 28 41.8	931.7	65.73	15 42.5	57 33.1	II.
5	U	15 56.15	1.899	10 55 36.10	124.10	5 19 2.4	963.1	65.56	15 46.5	57 48.0	II.
6	L	4 18.92	1.899	11 20 24.58	124.13	+ 2 4 11.6	983.6	65.60	15 50.6	58 2.8	II.
6	U	16 41.79	1.914	11 45 18.49	125.01	− 1 13 39.1	−992.9	65.86	15 54.6	58 17.4	II.
7	L	5 4.91	1.943	12 10 28.14	126.76	4 32 12.9	990.6	66.36	15 58.5	58 31.7	II.
7	U	17 28.48	1.987	12 36 4.22	129.42	7 49 5.4	975.9	67.08	16 2.3	58 45.7	II.
8	L	5 52.66	2.046	13 2 17.56	132.96	11 1 41.1	947.6	68.03	16 5.9	58 59.1	II.
8	U	18 17.64	2.119	13 29 18.64	137.35	−14 7 10.3	−904.6	69.18	16 9.3	59 11.7	II.
9	L	6 43.57	2.204	13 57 17.06	142.49	17 2 27.9	845.4	70.49	16 12.5	59 23.3	II.
9	U	19 10.59	2.299	14 26 20.65	148.18	19 44 12.2	768.8	71.92	16 15.3	59 33.6	II.
10	L	7 38.77	2.398	14 56 34.38	154.12	22 8 48.1	673.9	73.38	16 17.7	59 42.2	II.
10	U	20 8.13	2.494	15 27 58.98	159.91	−24 12 34.0	−560.6	74.77	16 19.4	59 48.7	II.
11	L	8 38.59	2.579	16 0 29.68	165.04	25 51 54.1	430.0	75.97	16 20.5	59 52.8	II.
11	U	21 9.96	2.645	16 33 55.33	168.98	27 3 35.6	284.8	76.88	16 20.9	59 54.2	II.
12	L	9 41.95	2.682	17 7 58.41	171.22	27 45 9.2	−129.5	77.38	16 20.5	59 52.5	II. N.
12	U	22 14.19	2.686	17 42 16.42	171.43	−27 55 8.5	+ 29.8	77.41	16 19.2	59 47.7	II. N.
13	L	10 46.26	2.654	18 16 24.42	169.55	27 33 23.2	186.7	76.93	16 17.0	59 39.6	II. N.
13	U	23 17.77	2.592	18 49 58.28	165.79	26 41 1.6	334.8	76.01	16 13.9	59 28.2	
14	L	11 48.37	2.505	19 22 37.63	160.56	25 20 21.9	469.0	74.73	16 9.9	59 13.8	
15	U	0 17.82	2.402	19 54 7.85	154.36	−23 34 33.8	+585.8	73.22	16 5.2	58 56.6	
15	L	12 45.99	2.292	20 24 20.80	147.76	21 27 17.9	683.5	71.58	15 59.9	58 37.0	
16	U	1 12.83	2.183	20 53 14.18	141.17	19 2 24.9	762.0	69.92	15 54.0	58 15.4	I.
16	L	13 38.40	2.079	21 20 50.47	134.96	16 23 40.4	822.3	68.33	15 47.7	57 52.4	I.
17	U	2 2.78	1.986	21 47 15.63	129.35	−13 34 33.7	+866.0	66.87	15 41.2	57 28.5	I.
17	L	14 26.11	1.905	22 12 37.77	124.47	10 38 12.7	895.0	65.59	15 34.6	57 4.2	I.
18	U	2 48.55	1.838	22 37 6.24	120.41	7 37 22.4	911.2	64.51	15 28.0	56 40.1	I.
18	L	15 10.27	1.784	23 0 50.97	117.19	4 34 25.1	916.5	63.64	15 21.6	56 16.6	I.
19	U	3 31.42	1.744	23 24 1.93	114.79	− 1 31 23.0	+912.3	63.00	15 15.5	55 54.3	I.
19	L	15 52.18	1.717	23 46 49.00	113.20	+ 1 29 57.4	899.8	62.59	15 9.9	55 33.5	I.
20	U	4 12.70	1.704	0 9 21.69	112.38	4 28 3.8	880.0	62.38	15 4.7	55 14.5	I.
20	L	16 33.13	1.703	0 31 49.21	112.32	7 21 32.9	853.6	62.39	15 0.1	54 57.7	I.
21	U	4 53.62	1.714	0 54 20.33	112.97	+10 9 7.4	+821.0	62.60	14 56.2	54 43.3	I.
21	L	17 14.31	1.736	1 17 3.37	114.30	12 49 33.0	782.2	62.99	14 53.0	54 31.5	I.
22	U	5 35.32	1.768	1 40 6.09	116.26	15 21 35.2	737.1	63.55	14 50.5	54 22.4	I.
22	L	17 56.79	1.810	2 3 35.68	118.77	17 43 57.1	685.5	64.26	14 48.8	54 16.1	I.
23	U	6 18.80	1.860	2 27 38.44	121.77	+19 55 18.0	+626.8	65.08	14 47.8	54 12.6	I.

Jan. 1, U Defective Illumination of *S.* 0″.28. Jan. 2, U Defective Illumination of *N.* 1″.20.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

ate.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
. 23	U	6 18.80	1.860	2 27 38.44	121.77	+19 55 18.0	+ 626.8	65.08	14 47.8	54 12.6	I. S.
23	L	18 41.45	1.916	2 52 19.55	125.14	21 54 11.2	560.7	65.99	14 47.6	54 11.9	I. S.
24	U	7 4.80	1.976	3 17 42.79	128.76	23 39 5.1	486.8	66.95	14 48.2	54 14.0	I. S.
24	L	19 28.89	2.038	3 43 50.10	132.46	25 8 23.6	404.8	67.91	14 49.5	54 18.7	I. S.
25	U	7 53.70	2.097	4 10 41.20	136.02	+26 20 28.8	+ 314.7	68.82	14 51.5	54 26.0	I. S.
25	L	20 19.20	2.151	4 38 13.33	139.25	27 13 44.8	216.7	69.63	14 54.1	54 35.6	I. S.
26	U	8 45.28	2.195	5 6 21.10	141.93	27 46 43.6	112.0	70.28	14 57.3	54 47.4	I. *N*. S.
26	L	21 11.83	2.227	5 34 56.66	143.86	27 58 11.3	+ 1.9	70.73	15 1.1	55 1.2	I. N. *S*.
27	U	9 38.68	2.245	6 3 50.19	144.91	+27 47 13.6	− 111.8	70.97	15 5.3	55 16.5	I. N.
27	L	22 5.64	2.247	6 32 50.75	145.03	27 13 21.9	226.7	70.96	15 9.8	55 33.2	I. N.
28	U	10 32.54	2.234	7 1 47.25	144.25	26 16 37.0	340.3	70.72	15 14.6	55 50.8	I. N.
28	L	22 59.20	2.208	7 30 29.55	142.69	24 57 29.9	450.0	70.29	15 19.6	56 9.1	I. N.
29	U	11 25.49	2.172	7 58 49.34	140.53	+23 17 0.1	− 553.7	69.72	15 24.6	56 27.7	I. N.
29	L	23 51.30	2.130	8 26 40.80	138.00	21 16 32.5	649.3	69.06	15 29.7	56 46.3	I. N.
30	U	12 16.60	2.085	8 54 0.81	135.33	18 57 53.2	735.5	68.37	15 34.7	57 4.5	*I*. II. N. *S*.
31	L	0 41.36	2.042	9 20 49.01	132.73	16 23 3.5	810.9	67.69	15 39.5	57 22.0	II. *N*. S.
31	U	13 5.63	2.004	9 47 7.54	130.41	+13 34 16.6	− 874.9	67.09	15 44.0	57 38.6	II. S.
eb. 1	L	1 29.48	1.972	10 13 0.66	128.52	10 33 52.9	926.9	66.60	15 48.2	57 54.0	II. S.
1	U	13 53.01	1.950	10 38 34.35	127.19	7 24 17.6	966.8	66.26	15 52.0	58 8.2	II. S.
2	L	2 16.33	1.939	11 3 55.95	126.52	4 7 59.6	994.1	66.11	15 55.5	58 20.9	II. S.
2	U	14 39.59	1.940	11 29 13.83	126.59	+ 0 47 29.9	−1008.7	66.16	15 58.6	58 32.2	II. S.
3	L	3 2.95	1.954	11 54 37.14	127.43	− 2 34 38.0	1010.4	66.42	16 1.3	58 42.0	II. S.
3	U	15 26.55	1.982	12 20 15.44	129.08	5 55 46.3	998.7	66.89	16 3.5	58 50.4	II. S.
4	L	3 50.56	2.023	12 46 18.55	131.55	9 13 13.3	973.4	67.59	16 5.4	58 57.4	II. S.
4	U	16 15.15	2.077	13 12 56.17	134.82	−12 24 10.7	− 933.8	68.48	16 7.0	59 3.1	II. S.
5	L	4 40.46	2.143	13 40 17.29	138.80	15 25 43.2	879.1	69.54	16 8.2	59 7.5	II. S.
5	U	17 6.63	2.219	14 8 29.78	143.36	18 14 48.1	809.0	70.74	16 9.1	59 10.7	II. S.
6	L	5 33.75	2.301	14 37 39.52	148.30	20 48 16.0	722.9	72.00	16 9.6	59 12.6	II. S.
6	U	18 1.86	2.385	15 7 49.36	153.32	−23 2 54.6	− 620.8	73.25	16 9.8	59 13.4	II. S.
7	L	6 30.96	2.463	15 38 58.18	158.05	24 55 35.4	503.5	74.42	16 9.7	59 13.0	II. S.
7	U	19 0.94	2.530	16 10 59.99	162.08	26 23 24.3	372.6	75.39	16 9.3	59 11.4	II. S.
8	L	7 31.61	2.577	16 43 43.61	164.95	27 23 54.1	230.9	76.06	16 8.5	59 8.4	II. S.
8	U	20 2.71	2.601	17 16 52.99	166.32	−27 55 20.0	− 82.6	76.36	16 7.3	59 4.1	II. S.
9	L	8 33.91	2.595	17 50 8.74	165.99	27 56 50.9	+ 67.4	76.24	16 5.7	58 58.2	II. N.
9	U	21 4.88	2.561	18 23 10.09	163.95	27 28 37.1	213.9	75.71	16 3.7	58 50.8	II. N.
10	L	9 35.28	2.502	18 55 37.53	160.39	26 31 50.5	352.1	74.81	16 1.2	58 41.8	II. N.
10	U	22 4.85	2.424	19 27 14.92	155.67	−25 8 36.3	+ 478.0	73.64	15 58.3	58 31.0	II. N.
11	L	10 33.40	2.333	19 57 50.82	150.21	23 21 40.1	588.7	72.24	15 54.9	58 18.6	II. N.
11	U	23 0.82	2.237	20 27 18.87	144.43	21 14 12.7	683.0	70.75	15 51.1	58 4.7	II. N.
12	L	11 27.09	2.141	20 55 37.45	138.69	18 49 35.3	760.4	69.26	15 46.9	57 49.3	
12	U	23 52.24	2.051	21 22 48.86	133.28	−16 11 8.2	+ 821.4	67.83	15 42.3	57 32.6	
13	L	12 16.36	1.970	21 48 58.18	128.38	13 22 2.8	867.0	66.53	15 37.5	57 14.9	
14	U	0 39.56	1.899	22 14 12.48	124.12	10 25 16.6	898.4	65.39	15 32.5	56 56.4	
14	L	13 1.98	1.840	22 38 39.87	120.57	7 23 30.7	917.1	64.43	15 27.3	56 37.5	
15	U	1 23.77	1.793	23 2 29.11	117.77	− 4 19 10.3	+ 924.4	63.67	15 22.1	56 18.4	I. S.

Jan. 26, U Defective Illumination of *N*. 0″.06.
Jan. 30, U Defective Illumination of *I*. 0″.00.
Jan. 30, U Defective Illumination of *S*. 0″.07.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limb.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Feb. 15	U	1 23.77	1.793	23 2 29.11	117.77	− 4 19 10.3	+ 924.4	63.67	15 22.1	56 18.4	I.
15	L	13 45.08	1.759	23 25 49.09	115.70	− 1 14 24.9	921.6	63.11	15 17.0	55 59.5	I.
16	U	2 6.04	1.737	23 48 48.67	114.36	+ 1 48 50.6	909.6	62.76	15 12.0	55 41.2	I.
16	L	14 26.81	1.726	0 11 36.45	113.72	4 48 51.5	889.3	62.62	15 7.3	55 23.9	I.
17	U	2 47.52	1.727	0 34 20.78	113.77	+ 7 44 3.4	+ 861.4	62.67	15 2.9	55 7.8	I.
17	L	15 8.31	1.739	0 57 9.60	114.48	10 32 57.9	826.4	62.89	14 58.9	54 53.3	I.
18	U	3 29.29	1.760	1 20 10.43	115.78	13 14 11.4	784.6	63.30	14 55.5	54 40.6	I.
18	L	15 50.59	1.791	1 43 30.29	117.63	15 46 22.7	736.0	63.86	14 52.6	54 30.0	I.
19	U	4 12.31	1.830	2 7 15.50	119.98	+18 8 10.4	+ 680.7	64.54	14 50.3	54 21.7	I.
19	L	16 34.55	1.876	2 31 31.53	122.75	20 18 12.2	618.4	65.33	14 48.8	54 16.0	I.
20	U	4 57.37	1.928	2 56 22.80	125.83	22 15 4.2	549.0	66.19	14 47.9	54 12.9	I.
20	L	17 20.83	1.982	3 21 52.30	129.10	23 57 19.5	472.3	67.09	14 47.8	54 12.5	I.
21	U	5 44.94	2.037	3 48 1.42	132.41	+25 23 30.3	+ 388.3	67.98	14 48.5	54 15.0	I.
21	L	18 9.70	2.089	4 14 49.51	135.57	26 32 9.5	297.1	68.82	14 50.0	54 20.4	I.
22	U	6 35.07	2.137	4 42 13.78	138.41	27 21 53.8	199.2	69.55	14 52.2	54 28.5	I.
22	L	19 0.95	2.176	5 10 9.27	140.75	27 51 27.1	+ 95.5	70.13	14 55.1	54 39.4	I.
23	U	7 27.24	2.204	5 38 29.02	142.43	+27 59 46.4	− 12.9	70.54	14 58.8	54 52.9	I. N.
23	L	19 53.79	2.219	6 7 4.54	143.36	27 46 5.4	124.3	70.76	15 3.2	55 8.8	I. N.
24	U	8 20.44	2.221	6 35 46.48	143.50	27 9 58.8	236.8	70.76	15 8.1	55 27.0	I. N.
24	L	20 47.05	2.211	7 4 25.58	142.89	26 11 25.4	348.4	70.57	15 13.6	55 47.0	I. N.
25	U	9 13.47	2.190	7 32 53.38	141.64	+24 50 48.9	− 457.0	70.20	15 19.4	56 8.6	I. N.
25	L	21 39.59	2.162	8 1 3.08	139.91	23 8 57.0	560.6	69.72	15 25.6	56 31.3	I. N.
26	U	10 5.33	2.128	8 28 49.98	137.88	21 7 0.8	657.4	69.16	15 32.0	56 54.8	I. N.
26	L	22 30.65	2.092	8 56 11.71	135.75	18 46 31.0	745.9	68.58	15 38.5	57 18.4	I. N.
27	U	10 55.55	2.059	9 23 8.37	133.72	+16 9 15.8	− 824.8	68.02	15 44.9	57 41.8	I. N.
27	L	23 20.08	2.030	9 49 42.19	131.97	13 17 18.8	892.8	67.53	15 51.0	58 4.4	I. N.
28	U	11 44.29	2.008	10 15 57.35	130.64	10 12 56.0	948.9	67.17	15 56.8	58 25.6	I. N.
Mar. 1	L	0 8.29	1.994	10 41 59.68	129.85	6 58 34.7	992.3	66.95	16 2.1	58 45.1	I. *II.* N.
1	U	12 32.20	1.992	11 7 56.23	129.70	+ 3 36 52.6	−1022.2	66.91	16 6.8	59 2.4	II.
2	L	0 56.14	2.001	11 33 55.09	130.24	+ 0 10 36.2	1037.9	67.06	16 10.8	59 17.2	II.
2	U	13 20.27	2.022	12 0 4.93	131.53	− 3 17 18.3	1038.6	67.42	16 14.1	59 29.2	II.
3	L	1 44.73	2.056	12 26 34.85	133.58	6 43 47.3	1023.6	67.99	16 16.6	59 38.2	II.
3	U	14 9.68	2.103	12 53 33.89	136.38	−10 5 39.3	− 992.3	68.75	16 18.2	59 44.2	II.
4	L	2 35.25	2.161	13 21 10.65	139.85	13 19 35.8	944.3	69.68	16 19.0	59 47.3	II.
4	U	15 1.57	2.228	13 49 32.63	143.89	16 22 13.4	879.1	70.75	16 19.1	59 47.6	II.
5	L	3 28.74	2.301	14 18 45.63	148.32	19 10 6.7	796.9	71.91	16 18.5	59 45.2	II.
5	U	15 56.81	2.377	14 48 52.75	152.86	−21 39 52.3	− 698.0	73.08	16 17.2	59 40.5	II. S
6	L	4 25.77	2.449	15 19 53.50	157.19	23 48 15.7	583.5	74.18	16 15.4	59 33.7	II. S
6	U	16 55.54	2.511	15 51 43.01	160.93	25 32 20.5	455.3	75.11	16 13.0	59 25.1	II. S
7	L	5 25.97	2.556	16 24 11.72	163.65	26 49 39.7	316.4	75.79	16 10.3	59 15.1	II. S
7	U	17 56.81	2.580	16 57 5.58	165.06	−27 38 26.9	− 170.7	76.13	16 7.3	59 4.0	II. S
8	L	6 27.78	2.577	17 30 7.05	164.91	27 57 46.5	− 22.6	76.09	16 3.9	58 51.8	II. S
8	U	18 58.56	2.549	18 2 57.22	163.18	27 47 40.0	+ 122.9	75.66	16 0.4	58 38.9	II. N.
9	L	7 28.85	2.496	18 35 17.74	160.01	27 9 3.7	261.5	74.87	15 56.8	58 25.5	II. N.
9	U	19 58.38	2.424	19 6 52.91	155.69	−26 3 44.0	+ 389.6	73.78	15 53.0	58 11.6	II. N.

Feb. 23, U Defective Illumination of *N.* 0″.02.

Feb. 28, U Defective Illumination of *S.* 0″.30.

MOON-CULMINATIONS, 1915.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASH

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″
ar. 9	U	19 58.38	2.424	19 6 52.91	155.69	−26 3 44.0	+ 389.6	73.78	15 53.0	58 11.6
10	L	8 26.97	2.339	19 37 31.11	150.58	24 34 4.3	504.6	72.48	15 49.1	57 57.5
10	U	20 54.49	2.248	20 7 5.37	145.08	22 42 52.6	604.9	71.06	15 45.2	57 43.0
11	L	9 20.91	2.156	20 35 33.14	139.56	20 33 9.3	689.9	69.61	15 41.2	57 28.3
11	U	21 46.25	2.068	21 2 55.63	134.26	−18 7 55.8	+ 759.9	68.19	15 37.1	57 13.4
12	L	10 10.57	1.987	21 29 17.00	129.40	15 30 8.7	815.6	66.87	15 33.0	56 58.3
12	U	22 33.97	1.916	21 54 43.40	125.12	12 42 34.5	857.9	65.69	15 28.9	56 43.1
13	L	10 56.58	1.855	22 19 22.26	121.49	9 47 48.3	887.8	64.67	15 24.7	56 27.9
13	U	23 18.54	1.806	22 43 21.69	118.54	− 6 48 12.7	+ 906.3	63.84	15 20.5	56 12.6
14	L	11 39.99	1.769	23 6 50.11	116.30	3 45 59.1	914.3	63.20	15 16.4	55 57.5
15	U	0 1.06	1.744	23 29 55.92	114.77	− 0 43 8.6	912.6	62.77	15 12.4	55 42.5
15	L	12 21.89	1.730	23 52 47.38	113.93	+ 2 18 26.8	901.9	62.53	15 8.4	55 28.0
16	U	0 42.61	1.726	0 15 32.46	113.72	+ 5 17 2.1	+ 882.7	62.48	15 4.6	55 14.0
16	L	13 3.35	1.732	0 38 18.79	114.13	8 10 58.7	855.4	62.61	15 1.0	55 0.8
17	U	1 24.24	1.749	1 1 13.59	115.11	10 58 41.8	820.4	62.91	14 57.6	54 48.5
17	L	13 45.37	1.775	1 24 23.51	116.64	13 38 39.4	777.9	63.36	14 54.6	54 37.4
18	U	2 6.86	1.808	1 47 54.62	118.64	+16 9 21.9	+ 727.9	63.94	14 51.9	54 27.6
18	L	14 28.79	1.848	2 11 52.26	121.04	18 29 20.2	670.5	64.64	14 49.7	54 19.5
19	U	2 51.23	1.893	2 36 20.71	123.76	20 37 6.0	605.8	65.43	14 48.0	54 13.3
19	L	15 14.24	1.942	3 1 23.10	126.67	22 31 11.1	533.8	66.26	14 46.9	54 9.0
20	U	3 37.84	1.991	3 27 1.12	129.66	+24 10 8.8	+ 454.6	67.09	14 46.3	54 7.0
20	L	16 2.03	2.040	3 53 14.76	132.59	25 32 35.0	368.6	67.91	14 46.4	54 7.4
21	U	4 26.78	2.085	4 20 2.21	135.28	26 37 10.1	276.2	68.64	14 47.2	54 10.3
21	L	16 52.03	2.123	4 47 19.69	137.57	27 22 41.9	178.3	69.27	14 48.7	54 15.8
22	U	5 17.69	2.152	5 15 1.69	139.34	+27 48 9.4	+ 75.7	69.75	14 51.0	54 24.1
22	L	17 43.64	2.171	5 43 1.21	140.49	27 52 44.7	− 30.2	70.06	14 54.0	54 35.2
23	U	6 9.75	2.179	6 11 10.42	140.95	27 35 57.4	137.8	70.18	14 57.8	54 49.0
23	L	18 35.88	2.175	6 39 21.12	140.73	26 57 35.3	245.6	70.12	15 2.3	55 5.5
24	U	7 1.92	2.162	7 7 25.69	139.93	+25 57 45.8	− 352.1	69.91	15 7.5	55 24.5
24	L	19 27.74	2.141	7 35 17.63	138.65	24 36 55.6	455.6	69.55	15 13.3	55 45.9
25	U	7 53.27	2.114	8 2 52.10	137.06	22 55 49.2	554.6	69.11	15 19.7	56 9.4
25	L	20 18.47	2.085	8 30 6.27	135.31	20 55 27.8	647.9	68.62	15 26.6	56 34.7
26	U	8 43.32	2.056	8 56 59.42	133.58	+18 37 7.0	− 734.3	68.14	15 38.9	57 1.4
26	L	21 7.84	2.031	9 23 32.96	132.06	16 2 16.3	812.7	67.70	15 41.4	57 29.0
27	U	9 32.09	2.012	9 49 50.16	130.88	13 12 37.3	882.1	67.35	15 49.0	57 56.9
27	L	21 56.15	2.000	10 15 55.98	130.19	10 10 5.9	941.3	67.13	15 56.5	58 24.5
28	U	10 20.12	1.998	10 41 56.84	130.07	+ 6 56 50.4	− 989.2	67.07	16 3.8	58 51.2
28	L	22 44.14	2.007	11 8 0.25	130.62	3 35 14.8	1024.5	67.19	16 10.6	59 16.4
29	U	11 8.34	2.029	11 34 14.70	131.92	+ 0 7 58.3	1045.8	67.51	16 16.8	59 39.2
29	L	23 32.88	2.063	12 0 49.22	133.98	− 3 22 2.4	1051.6	68.04	16 22.3	59 59.2
30	U	11 57.91	2.110	12 27 53.17	136.82	− 6 51 33.3	−1040.6	68.78	16 26.8	60 15.7
31	L	0 23.58	2.170	12 55 35.78	140.42	10 17 3.7	1011.3	69.71	16 30.2	60 28.3
31	U	12 50.03	2.240	13 24 5.53	144.66	13 34 46.9	962.5	70.80	16 32.5	60 36.7
pr. 1	L	1 17.38	2.319	13 53 29.44	149.38	16 40 45.2	893.7	72.02	16 33.6	60 40.7
1	U	13 45.71	2.402	14 23 52.04	154.39	−19 30 55.9	− 804.7	73.29	16 33.5	60 40.4

Mar. 23, U Defective Illumination of *S.* 0″.17. Mar. 30, U Defective Illumination o

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Apr. 1	L	1 17.38	2.319	13 53 29.44	149.38	−16 40 45.2	−893.7	72.02	16 33.6	60 40.7	II. S.
1	U	13 45.71	2.402	14 23 52.04	154.39	19 30 55.9	804.7	73.29	16 33.5	60 40.4	II. S.
2	L	2 15.03	2.483	14 55 14.34	159.27	22 1 18.5	696.0	74.52	16 32.3	60 35.8	II. S.
2	U	14 45.28	2.556	15 27 32.71	163.63	24 8 9.2	569.7	75.61	16 30.0	60 27.3	II. S.
3	L	3 16.32	2.613	16 0 38.20	167.05	−25 48 13.9	−429.0	76.46	16 26.7	60 15.4	II. S.
3	U	15 47.90	2.646	16 34 16.42	169.05	26 59 4.4	278.2	76.97	16 22.7	60 0.5	II. S.
4	L	4 19.71	2.651	17 8 8.61	169.34	27 39 12.0	−122.8	77.06	16 17.9	59 43.2	II. S.
4	U	16 51.40	2.626	17 41 53.50	167.82	27 48 15.8	+ 31.5	76.73	16 12.7	59 24.1	II. S.
5	L	5 22.61	2.573	18 15 9.92	164.63	−27 27 2.4	+179.3	75.98	16 7.2	59 3.8	II. N. S.
5	U	17 53.05	2.497	18 47 39.33	160.06	26 37 18.7	316.0	74.88	16 1.4	58 42.7	II. N.
6	L	6 22.47	2.405	19 19 7.62	154.53	25 21 36.7	438.6	73.53	15 55.6	58 21.3	II. N.
6	U	18 50.73	2.304	19 49 26.03	148.49	23 42 56.1	545.5	72.01	15 49.8	58 0.0	II. N.
7	L	7 17.77	2.202	20 18 31.00	142.36	−21 44 29.2	+636.3	70.44	15 44.1	57 39.0	II. N.
7	U	19 43.60	2.103	20 46 23.46	136.45	19 29 27.4	711.5	68.89	15 38.5	57 18.6	II. N.
8	L	8 8.30	2.014	21 13 7.68	131.01	17 0 52.7	772.0	67.43	15 33.2	56 59.0	II. N.
8	U	20 31.97	1.934	21 38 50.31	126.20	14 21 32.2	819.1	66.11	15 28.1	56 40.3	II. N.
9	L	8 54.75	1.866	22 3 39.37	122.10	−11 34 0.0	+854.2	64.95	15 23.2	56 22.4	II. N.
9	U	21 16.79	1.810	22 27 43.70	118.74	8 40 34.0	878.3	63.99	15 18.6	56 5.5	II. N.
10	L	9 38.24	1.767	22 51 12.30	116.14	5 43 19.3	892.5	63.23	15 14.3	55 49.6	II. N.
10	U	21 59.24	1.736	23 14 14.16	114.28	− 2 44 10.7	897.4	62.69	15 10.2	55 34.7	II. N.
11	L	10 19.95	1.717	23 36 58.06	113.14	+ 0 15 5.6	+893.8	62.33	15 6.4	55 20.7	II. N.
11	U	22 40.49	1.709	23 59 32.43	112.69	3 12 50.1	882.1	62.17	15 2.8	55 7.6	II. N.
12	L	11 1.01	1.713	0 22 5.24	112.88	6 7 26.5	862.6	62.21	14 59.6	54 55.6	
12	U	23 21.63	1.726	0 44 44.07	113.68	8 57 21.2	835.3	62.42	14 56.5	54 44.5	
13	L	11 42.47	1.748	1 7 35.86	115.03	+11 41 2.3	+800.2	62.79	14 53.8	54 34.4	
14	U	0 3.62	1.779	1 30 46.94	116.89	14 16 56.6	757.5	63.31	14 51.3	54 25.4	
14	L	12 25.19	1.817	1 54 22.93	119.18	16 43 31.6	707.0	63.95	14 49.2	54 17.5	
15	U	0 47.25	1.860	2 18 28.41	121.80	18 59 13.7	648.7	64.68	14 47.4	54 10.9	
15	L	13 9.86	1.908	2 43 6.80	124.64	+21 2 29.1	+582.6	65.48	14 46.0	54 5.7	I. S.
16	U	1 33.05	1.957	3 8 20.13	127.59	22 51 44.9	508.8	66.30	14 45.0	54 2.0	I. S.
16	L	13 56.82	2.005	3 34 8.75	130.50	24 25 31.0	427.7	67.10	14 44.4	53 59.9	I. S.
17	U	2 21.15	2.050	4 0 31.14	133.19	25 42 22.7	339.8	67.85	14 44.3	53 59.6	I. S.
17	L	14 45.99	2.089	4 27 23.87	135.52	+26 41 3.5	+246.0	68.50	14 44.7	54 1.2	I. S.
18	U	3 11.25	2.119	4 54 41.69	137.34	27 20 28.2	147.4	69.01	14 45.7	54 4.9	I. S.
18	L	15 36.81	2.139	5 22 17.80	138.56	27 39 47.0	+ 45.3	69.37	14 47.4	54 10.8	I. S.
19	U	4 2.54	2.148	5 50 4.38	139.09	27 38 26.9	− 58.8	69.53	14 49.6	54 19.1	I. S.
19	L	16 28.31	2.145	6 17 53.13	138.93	+27 16 14.1	−163.2	69.52	14 52.5	54 29.8	I. S.
20	U	4 53.99	2.132	6 45 36.22	138.16	26 33 14.0	266.4	69.35	14 56.1	54 43.0	I. N.
20	L	17 19.46	2.111	7 13 6.75	136.86	25 29 49.9	367.1	69.03	15 0.4	54 58.7	I. N.
21	U	5 44.63	2.083	7 40 19.41	135.21	24 6 41.4	463.8	68.61	15 5.4	55 16.9	I. N.
21	L	18 9.45	2.053	8 7 10.86	133.35	+22 24 41.6	−555.5	68.13	15 11.0	55 37.5	I. N.
22	U	6 33.89	2.022	8 33 39.86	131.49	20 24 54.4	641.4	67.63	15 17.3	56 0.5	I. N.
22	L	18 57.98	1.993	8 59 47.25	129.78	18 8 32.7	721.0	67.17	15 24.1	56 25.6	I. N.
23	U	7 21.75	1.970	9 25 35.83	128.37	15 36 56.8	793.7	66.77	15 31.4	56 52.5	I. N.
23	L	19 45.29	1.954	9 51 10.19	127.43	+12 51 34.7	−858.7	66.49	15 39.2	57 20.9	I. N.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
pr.23	L	19 45.29	1.954	9 51 10.19	127.43	+12 51 34.7	− 858.7	66.49	15 39.2	57 20.9	I. N.
24	U	8 8.69	1.948	10 16 36.38	127.04	9 54 2.4	915.2	66.36	15 47.2	57 50.4	I. N.
24	L	20 32.08	1.952	10 42 1.75	127.31	6 46 6.2	962.4	66.41	15 55.4	58 20.4	I. N.
25	U	8 55.59	1.969	11 7 34.77	128.32	3 29 45.1	999.1	66.65	16 3.5	58 50.2	I. N.
25	L	21 19.39	1.999	11 33 24.74	130.15	+ 0 7 14.5	−1023.8	67.10	16 11.4	59 19.3	I. N.
26	U	9 43.63	2.044	11 59 41.66	132.82	− 3 18 51.4	1034.7	67.78	16 18.9	59 46.7	I. N.
26	L	22 8.50	2.103	12 26 35.91	136.36	6 45 35.7	1029.9	68.68	16 25.7	60 11.8	I. N.
27	U	10 34.15	2.176	12 54 17.78	140.75	10 9 37.2	1007.2	69.79	16 31.7	60 33.8	I. N.
27	L	23 0.76	2.261	13 22 56.92	145.88	−13 27 9.1	− 964.6	71.09	16 36.7	60 51.9	I. N.*S.*
28	U	11 28.46	2.356	13 52 41.42	151.60	16 34 1.7	900.4	72.51	16 40.4	61 5.5	I. S.
28	L	23 57.33	2.456	14 23 36.65	157.61	19 25 47.9	813.4	73.98	16 42.7	61 14.1	I. *II.* S.
29	U	12 27.39	2.554	14 55 43.81	163.51	21 57 54.1	703.8	75.41	16 43.6	61 17.5	II. S.
30	L	0 58.58	2.641	15 28 58.51	168.77	−24 5 55.9	− 573.1	76.69	16 43.1	61 15.5	II. S.
30	U	13 30.71	2.709	16 3 9.65	172.83	25 45 58.7	424.8	77.67	16 41.1	61 8.3	II. S.
ay 1	L	2 3.48	2.747	16 37 59.39	175.13	26 55 1.5	264.2	78.24	16 37.9	60 56.3	II. S.
1	U	14 36.50	2.750	17 13 4.41	175.32	27 31 17.5	− 98.2	78.31	16 33.4	60 39.9	II. S.
2	L	3 9.34	2.717	17 47 58.55	173.34	−27 34 25.5	+ 65.9	77.87	16 27.9	60 19.9	II. S.
2	U	15 41.58	2.651	18 22 16.37	169.33	27 5 31.3	221.2	76.97	16 21.7	59 57.0	II. *N.* S.
3	L	4 12.85	2.558	18 55 36.29	163.76	26 6 54.0	362.3	75.67	16 14.8	59 31.9	II. N.
3	U	16 42.91	2.449	19 27 42.91	157.21	24 41 45.6	486.0	74.10	16 7.6	59 5.4	II. N.
4	L	5 11.61	2.333	19 58 27.61	150.21	−22 53 45.5	+ 590.9	72.39	16 0.2	58 38.2	II. N.
4	U	17 38.90	2.217	20 27 48.09	143.24	20 46 40.2	677.0	70.64	15 52.8	58 10.9	II. N.
5	L	6 4.84	2.108	20 55 47.07	136.67	18 24 7.4	745.6	68.95	15 45.5	57 44.1	II. N.
5	U	18 29.53	2.009	21 22 30.90	130.75	15 49 26.2	798.6	67.39	15 38.4	57 18.1	II. N.
6	L	6 53.12	1.924	21 48 8.11	125.60	−13 5 34.0	+ 837.8	65.99	15 31.6	56 53.3	II. N.
6	U	19 15.76	1.852	22 12 48.45	121.28	10 15 6.0	864.9	64.79	15 25.2	56 29.9	II. N.
7	L	7 37.62	1.794	22 36 42.13	117.83	7 20 16.7	881.6	63.82	15 19.3	56 8.1	II. N.
7	U	19 58.88	1.751	22 59 59.39	115.21	4 23 4.9	889.0	63.05	15 13.8	55 48.0	II. N.
8	L	8 19.70	1.721	23 22 50.16	113.40	− 1 25 14.9	+ 888.0	62.51	15 8.8	55 29.7	II. N.
8	U	20 40.23	1.704	23 45 23.93	112.36	+ 1 31 37.8	879.5	62.19	15 4.3	55 13.1	II. N.
9	L	9 0.63	1.699	0 7 49.77	112.07	4 26 4.5	863.7	62.07	15 0.3	54 58.2	II. N.
9	U	21 21.05	1.705	0 30 16.13	112.45	7 16 39.5	840.9	62.15	14 56.7	54 45.1	II. N.
10	L	9 41.60	1.722	0 52 50.93	113.46	+10 1 58.6	+ 811.1	62.41	14 53.6	54 33.6	II. N.
10	U	22 2.41	1.748	1 15 41.40	115.04	12 40 36.9	774.1	62.82	14 50.9	54 23.7	II. N.
11	L	10 23.59	1.783	1 38 54.03	117.14	15 11 7.0	729.8	63.38	14 48.6	54 15.4	II. N.
11	U	22 45.23	1.825	2 2 34.39	119.66	17 31 59.4	677.8	64.05	14 46.7	54 8.5	II. N.
12	L	11 7.41	1.872	2 26 46.94	122.49	+19 41 41.8	+ 618.0	64.81	14 45.2	54 3.0	
12	U	23 30.17	1.922	2 51 34.70	125.50	21 38 39.7	550.3	65.62	14 44.1	53 59.0	
13	L	11 53.54	1.973	3 16 59.11	128.55	23 21 18.8	474.9	66.44	14 43.4	53 56.4	
14	U	0 17.52	2.022	3 42 59.62	131.48	24 48 7.4	392.0	67.22	14 43.1	53 55.2	
14	L	12 42.05	2.065	4 9 33.65	134.11	+25 57 39.7	+ 302.4	67.93	14 43.2	53 55.5	
15	U	1 7.05	2.101	4 36 36.49	136.27	26 48 40.3	207.0	68.51	14 43.7	53 57.3	I. S.
15	L	13 32.43	2.126	5 4 1.52	137.80	27 20 7.8	107.1	68.93	14 44.6	54 0.6	I. S.
16	U	1 58.04	2.140	5 31 40.60	138.59	27 31 19.4	+ 4.5	69.16	14 45.9	54 5.6	I. S.
16	L	14 23.74	2.141	5 59 24.83	138.64	+27 21 52.9	− 99.0	69.21	14 47.8	54 12.3	I. S.

May 2, U Defective Illumination of *N.* 0″.11.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
May 16	L	14 23.74	2.141	5 59 24.83	138.64	+27 21 52.9	− 99.0	69.21	14 47.8	54 12.3	I. S
17	U	2 49.37	2.129	6 27 5.16	137.97	26 51 47.9	201.6	69.07	14 50.1	54 20.9	I. S
17	L	15 14.80	2.107	6 54 33.37	136.63	26 1 25.3	301.7	68.76	14 52.9	54 31.3	I. N.
18	U	3 39.91	2.077	7 21 42.62	134.83	24 51 24.9	397.7	68.32	14 56.3	54 43.7	I. N.
18	L	16 4.63	2.042	7 48 28.06	132.71	+23 22 42.2	−488.5	67.80	15 0.3	54 58.2	I. N.
19	U	4 28.91	2.004	8 14 47.06	130.46	21 36 24.2	573.4	67.23	15 4.8	55 14.7	I. N.
19	L	16 52.74	1.968	8 40 39.21	128.26	19 33 46.5	651.8	66.67	15 9.9	55 33.4	I. N.
20	U	5 16.16	1.935	9 6 6.31	126.31	17 16 9.6	723.2	66.16	15 15.5	55 54.1	I. N.
20	L	17 39.22	1.909	9 31 12.03	124.73	+14 44 57.6	−787.5	65.74	15 21.7	56 16.8	I. N.
21	U	6 2.01	1.891	9 56 1.69	123.66	12 1 37.6	844.5	65.45	15 28.4	56 41.4	I. N.
21	L	18 24.65	1.884	10 20 42.13	123.20	9 7 39.9	893.7	65.33	15 35.5	57 7.6	I. N.
22	U	6 47.27	1.888	10 45 21.30	123.46	6 4 40.4	934.7	65.39	15 43.0	57 35.1	I. N.
22	L	19 10.02	1.905	11 10 8.21	124.50	+ 2 54 22.4	−966.6	65.66	15 50.8	58 3.6	I. N.
23	U	7 33.06	1.937	11 35 12.78	126.40	− 0 21 18.9	988.4	66.16	15 58.7	58 32.6	I. N.
23	L	19 56.57	1.984	12 0 45.57	129.21	3 40 13.2	998.5	66.89	16 6.6	59 1.6	I. N.
24	U	8 20.74	2.046	12 26 57.70	132.96	6 59 50.3	995.2	67.86	16 14.3	59 29.9	I. N.
24	L	20 45.74	2.124	12 54 0.45	137.65	−10 17 16.1	−976.3	69.05	16 21.6	59 56.7	I. N.
25	U	9 11.77	2.216	13 22 4.68	143.20	13 29 8.7	939.3	70.45	16 28.3	60 21.3	I. N.
25	L	21 38.98	2.321	13 51 20.12	149.47	16 31 38.2	882.0	72.01	16 34.2	60 43.0	I. N.
26	U	10 7.50	2.433	14 21 54.03	156.22	19 20 27.9	802.4	73.66	16 39.1	61 0.9	I. N.
26	L	22 37.37	2.546	14 53 49.76	163.03	−21 51 2.3	−699.4	75.29	16 42.8	61 14.3	I. N.S
27	U	11 8.57	2.651	15 27 4.89	169.36	23 58 41.4	573.4	76.79	16 45.1	61 22.7	I. S
27	L	23 40.92	2.737	16 1 29.83	174.54	25 39 1.7	426.9	78.00	16 45.9	61 25.7	I. S
28	U	12 14.15	2.794	16 36 47.05	177.96	26 48 23.3	264.7	78.79	16 45.2	61 23.2	II. S
29	L	0 47.83	2.813	17 12 31.98	179.11	−27 24 18.6	− 93.7	79.07	16 43.0	61 15.1	II. S
29	U	13 21.50	2.791	17 48 15.69	177.77	27 25 52.4	+ 77.6	78.77	16 39.4	61 1.8	II. S
30	L	1 54.66	2.730	18 23 28.86	174.06	26 53 49.9	241.0	77.93	16 34.5	60 43.8	II. N.S
30	U	14 26.88	2.637	18 57 45.85	168.48	25 50 26.6	389.9	76.65	16 28.5	60 21.9	II. N.S
31	L	2 57.85	2.523	19 30 47.63	161.65	−24 19 6.6	+519.9	75.04	16 21.6	59 56.8	II. N.
31	U	15 27.39	2.399	20 2 23.04	154.20	22 23 53.6	628.7	73.25	16 14.1	59 29.3	II. N.
June 1	L	3 55.43	2.275	20 32 28.32	146.71	20 9 3.3	716.3	71.41	16 6.2	59 0.3	II. N.
1	U	16 22.01	2.157	21 1 5.76	139.61	17 38 43.0	784.0	69.63	15 58.1	58 30.5	II. N.
2	L	4 47.24	2.050	21 28 21.86	133.19	−14 56 38.8	+834.0	67.98	15 50.0	58 0.7	II. N.
2	U	17 11.27	1.957	21 54 25.78	127.61	12 6 10.1	868.5	66.50	15 42.0	57 31.3	II. N.
3	L	5 34.27	1.879	22 19 28.03	122.94	9 10 7.4	889.8	65.25	15 34.3	57 3.0	II. N.
3	U	17 56.43	1.817	22 43 39.73	119.18	6 10 56.9	900.1	64.22	15 27.0	56 36.1	II. N.
4	L	6 17.94	1.770	23 7 11.85	116.32	− 3 10 41.9	+900.9	63.42	15 20.1	56 11.0	II. N.
4	U	18 38.96	1.737	23 30 15.06	114.35	− 0 11 8.9	893.3	62.86	15 13.8	55 47.9	II. N.
5	L	6 59.68	1.718	23 52 59.58	113.20	+ 2 46 8.6	878.4	62.52	15 8.1	55 27.0	II. N.
5	U	19 20.24	1.711	0 15 34.99	112.82	5 39 46.0	856.7	62.39	15 3.0	55 8.3	II. N.
6	L	7 40.80	1.717	0 38 10.27	113.18	+ 8 28 23.5	+828.5	62.46	14 58.5	54 51.8	II. N.
6	U	20 1.50	1.734	1 0 53.81	114.19	11 10 44.0	793.9	62.72	14 54.6	54 37.6	II. N.
7	L	8 22.46	1.761	1 23 53.20	115.81	13 45 29.3	752.7	63.15	14 51.4	54 25.6	II. N
7	U	20 43.80	1.797	1 47 15.23	117.96	16 11 19.4	704.6	63.71	14 48.7	54 15.8	II. N.
8	L	9 5.61	1.840	2 11 5.73	120.54	+18 26 50.5	+649.4	64.39	14 46.6	54 8.1	II. N.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
une 8	L	9 5.61	1.840	2 11 5.73	120.54	+18 26 50.5	+649.4	64.39	14 46.6	54 8.1	II. N.
8	U	21 27.97	1.888	2 35 29.23	123.44	20 30 35.7	586.8	65.16	14 45.1	54 2.4	II. N.
9	L	9 50.92	1.939	3 0 28.79	126.52	22 21 4.4	516.6	65.96	14 44.0	53 58.6	II. N.
9	U	22 14.50	1.991	3 26 5.68	129.62	23 56 45.7	438.8	66.77	14 43.5	53 56.5	II. N.
10	L	10 38.69	2.040	3 52 19.04	132.56	+25 16 9.7	+353.8	67.52	14 43.4	53 56.1	II. S.
10	U	23 3.43	2.083	4 19 5.76	135.15	26 17 52.4	262.2	68.18	14 43.7	53 57.3	
11	L	11 28.63	2.117	4 46 20.51	137.21	27 0 40.6	165.0	68.70	14 44.4	54 0.0	
11	U	23 54.18	2.140	5 13 55.93	138.58	27 23 35.9	+ 63.8	69.05	14 45.5	54 4.2	
12	L	12 19.93	2.149	5 41 43.13	139.17	+27 26 0.1	− 39.8	69.20	14 47.0	54 9.7	
13	U	0 45.71	2.146	6 9 32.51	138.94	27 7 37.1	143.8	69.15	14 48.9	54 16.6	
13	L	13 11.37	2.129	6 37 14.48	137.95	26 28 35.2	246.1	68.92	14 51.2	54 24.8	I. S.
14	U	1 36.76	2.101	7 4 40.44	136.29	25 29 25.5	344.8	68.51	14 53.8	54 34.3	I. S.
14	L	14 1.77	2.066	7 31 43.45	134.14	+24 10 59.8	−438.5	67.97	14 56.7	54 45.2	I. N.
15	U	2 26.32	2.025	7 58 18.69	131.69	22 34 26.6	526.0	67.36	15 0.1	54 57.5	I. N.
15	L	14 50.37	1.983	8 24 23.72	129.14	20 41 6.3	606.2	66.71	15 3.8	55 11.1	I. N.
16	U	3 13.91	1.942	8 49 58.42	126.68	18 32 27.3	678.9	66.09	15 7.9	55 26.2	I. N.
16	L	15 36.98	1.905	9 15 4.91	124.46	+16 10 2.2	−743.8	65.52	15 12.4	55 42.7	I. N.
17	U	3 59.65	1.875	9 39 47.13	122.65	13 35 25.9	800.8	65.06	15 17.3	56 0.7	I. N.
17	L	16 22.01	1.854	10 4 10.67	121.38	10 50 14.2	849.8	64.74	15 22.6	56 20.1	I. N.
18	U	4 44.18	1.843	10 28 22.51	120.72	7 56 3.5	890.7	64.58	15 28.2	56 40.8	I. N.
18	L	17 6.28	1.844	10 52 30.67	120.77	+ 4 54 32.1	−923.1	64.61	15 34.2	57 2.9	I. N.
19	U	5 28.47	1.858	11 16 44.20	121.63	+ 1 47 22.3	946.9	64.86	15 40.6	57 26.1	I. N.
19	L	17 50.92	1.886	11 41 12.91	123.32	− 1 23 36.6	961.2	65.32	15 47.1	57 50.2	I. N.
20	U	6 13.79	1.929	12 6 7.34	125.91	4 36 25.0	965.0	66.03	15 53.9	58 14.9	I. N.
20	L	18 37.28	1.988	12 31 38.47	129.45	− 7 48 48.5	−956.8	66.97	16 0.7	58 39.9	I. N.
21	U	7 1.56	2.062	12 57 57.58	133.91	10 58 14.5	935.1	68.14	16 7.4	59 4.7	I. N.
21	L	19 26.82	2.151	13 25 15.77	139.27	14 1 47.3	897.7	69.52	16 14.0	59 28.8	I. N.
22	U	7 53.23	2.253	13 53 43.22	145.42	16 56 6.3	842.4	71.08	16 20.2	59 51.6	I. N.
22	L	20 20.94	2.365	14 23 28.21	152.14	−19 37 25.3	−767.3	72.73	16 25.9	60 12.5	I. N.
23	U	8 50.01	2.481	14 54 35.68	159.10	22 1 35.7	670.8	74.41	16 30.9	60 30.6	I. N.
23	L	21 20.45	2.592	15 27 5.57	165.79	24 4 17.3	552.5	75.99	16 34.9	60 45.5	I. N.
24	U	9 52.15	2.689	16 0 51.15	171.61	25 41 15.2	413.8	77.34	16 37.9	60 56.5	I. N. *S.*
24	L	22 24.87	2.760	16 35 38.04	175.91	−26 48 42.5	−258.3	78.32	16 39.6	61 3.0	I. *N.* S.
25	U	10 58.25	2.796	17 11 4.35	178.10	27 23 48.8	− 91.6	78.81	16 40.1	61 4.7	I. S.
25	L	23 31.83	2.793	17 46 42.78	177.88	27 25 5.0	+ 78.7	78.75	16 39.2	61 1.3	I. S.
26	U	12 5.12	2.749	18 22 3.97	175.25	26 52 38.2	244.3	78.14	16 36.9	60 52.9	*I.* II. S.
27	L	0 37.67	2.671	18 56 40.79	170.57	−25 48 9.6	+397.8	77.04	16 33.3	60 39.8	II. *N.* S.
27	U	13 9.13	2.568	19 30 11.63	164.36	24 14 40.2	533.7	75.58	16 28.6	60 22.4	II. *N.* S.
28	L	1 39.25	2.451	20 2 22.37	157.32	22 16 3.8	648.6	73.90	16 22.8	60 1.1	II. N. *S.*
28	U	14 7.94	2.330	20 33 6.42	150.02	19 56 40.6	741.5	72.12	16 16.2	59 36.7	II. N.
29	L	2 35.18	2.212	21 2 23.88	142.96	−17 20 51.4	+813.1	70.36	16 8.9	59 10.1	II. N.
29	U	15 1.07	2.104	21 30 19.59	136.45	14 32 42.1	865.2	68.71	16 1.2	58 41.8	II. N.
30	L	3 25.73	2.009	21 57 1.70	130.71	11 35 53.9	900.1	67.23	15 53.3	58 12.7	II. N.
30	U	15 49.34	1.928	22 22 40.16	125.85	8 33 39.4	920.0	65.96	15 45.3	57 43.4	II. N.
uly 1	L	4 12.06	1.862	22 47 25.78	121.91	− 5 28 43.3	+927.4	64.91	15 37.5	57 14.7	II. N.

June 24, U Defective Illumination of *S.* 0″.01.
June 26, U Defective Illumination of *I.* 0°.00,

June 27, U Defective Illumination of *N.* 0″.05.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 1	L	4 12.06	1.862	22 47 25.78	121.91	− 5 28 43.3	+927.4	64.91	15 37.5	57 14.7	II. N.
1	U	16 34.09	1.812	23 11 29.52	118.87	− 2 23 25.4	924.0	64.10	15 29.9	56 46.9	II. N.
2	L	4 55.61	1.776	23 35 2.15	116.72	+ 0 40 15.7	911.5	63.51	15 22.7	56 20.5	II. N.
2	U	17 16.78	1.754	23 58 14.00	115.40	3 40 37.9	891.0	63.15	15 16.0	55 56.0	II. N.
3	L	5 37.76	1.745	0 21 14.82	114.86	+ 6 36 11.3	+863.4	63.01	15 9.9	55 33.6	II. N.
3	U	17 58.72	1.749	0 44 13.77	115.08	9 25 34.2	829.3	63.07	15 4.4	55 13.5	II. N.
4	L	6 19.78	1.763	1 7 19.34	115.97	12 7 30.0	788.9	63.31	14 59.6	54 55 8	II. N.
4	U	18 41.08	1.788	1 30 39.30	117.45	14 40 43.2	742.2	63.73	14 55.5	54 40.7	II. N.
5	L	7 2.74	1.822	1 54 20.52	119.48	+17 3 57.7	+689.1	64.28	14 52.1	54 28.1	II. N.
5	U	19 24.85	1.863	2 18 28.88	121.95	19 15 55.5	629.4	64.93	14 49.3	54 18.1	II. N.
6	L	7 47.48	1.910	2 43 9.00	124.75	21 15 15.2	562.7	65.67	14 47.3	54 10.6	II. N.
6	U	20 10.70	1.959	3 8 23.92	127.74	23 0 33.1	489.0	66.44	14 45.9	54 5.6	II. N.
7	L	8 34.51	2.009	3 34 14.89	130.74	+24 30 24.5	+408.3	67.21	14 45.2	54 2.8	II. N.
7	U	20 58.91	2.056	4 0 41.03	133.56	25 43 25.6	320.8	67.93	14 45.1	54 2.4	II. N.
8	L	9 23.84	2.098	4 27 39.21	136.04	26 38 18.1	227.0	68.54	14 45.5	54 3.9	II. N.
8	U	21 49.21	2.130	4 55 4.07	137.99	27 13 53.4	128.1	69.01	14 46.4	54 7.4	II. S.
9	L	10 14.90	2.151	5 22 48.25	139.25	+27 29 17.7	+ 25.5	69.30	14 47.8	54 12.6	II. S.
9	U	22 40.77	2.159	5 50 42.89	139.73	27 23 56.4	− 79.1	69.40	14 49.7	54 19.4	II. S.
10	L	11 6.66	2.153	6 18 38.47	139.40	26 57 36.9	183.9	69.30	14 52.0	54 27.7	
10	U	23 32.40	2.135	6 46 25.50	138.31	26 10 31.3	286.6	69.00	14 54.5	54 37.2	
11	L	11 57.86	2.107	7 13 55.53	136.59	+25 3 14.6	−385.4	68.55	14 57.4	54 47.8	
12	U	0 22.92	2.070	7 41 1.75	134.38	23 36 43.9	478.7	67.97	15 0.6	54 59.5	
12	L	12 47.51	2.028	8 7 39.47	131.87	21 52 13.6	565.1	67.32	15 4.0	55 12.0	
13	U	1 11.59	1.985	8 33 46.31	129.26	19 51 11.8	643.8	66.65	15 7.7	55 25.4	I. N.
13	L	13 35.15	1.943	8 59 22.28	126.76	+17 35 15.8	−714.1	65.99	15 11.5	55 39.5	I. N.
14	U	1 58.24	1.905	9 24 29.40	124.50	15 6 8.9	775.6	65.40	15 15.5	55 54.2	I. N.
14	L	14 20.91	1.874	9 49 11.57	122.63	12 25 37.4	828.1	64.92	15 19.7	56 9.6	I. N.
15	U	2 43.25	1.852	10 13 34.28	121.26	9 35 29.1	871.7	64.58	15 24.1	56 25.5	I. N.
15	L	15 5.39	1.839	10 37 44.25	120.51	+ 6 37 32.8	−906.1	64.41	15 28.6	56 42.0	I. N.
16	U	3 27.44	1.838	11 1 49.26	120.45	3 33 38.7	931.3	64.42	15 33.2	56 59.1	I. N.
16	L	15 49.55	1.850	11 25 57.97	121.15	+ 0 25 38.7	947.0	64.64	15 38.0	57 16.6	I. N.
17	U	4 11.88	1.875	11 50 19.75	122.64	− 2 44 30.1	952.7	65.08	15 42.9	57 34.6	I. N.
17	L	16 34.59	1.913	12 15 4.52	124.98	− 5 54 43.5	−947.7	65.74	15 47.9	57 52.9	I. N.
18	U	4 57.86	1.967	12 40 22.60	128.19	9 2 47.7	931.0	66.62	15 52.9	58 11.4	I. N.
18	L	17 21.86	2.035	13 6 24.43	132.27	12 6 15.6	901.4	67.71	15 57.9	58 29.9	I. N.
19	U	5 46.75	2.116	13 33 20.22	137.18	15 2 23.5	857.4	69.00	16 2.9	58 48.2	I. N.
19	L	18 12.69	2.209	14 1 19.25	142.79	−17 48 9.5	−797.4	70.45	16 7.8	59 6.0	I. N.
20	U	6 39.80	2.311	14 30 29.03	148.91	20 20 13.1	720.1	72.00	16 12.4	59 22.9	I. N.
20	L	19 8.17	2.417	15 0 54.12	155.26	22 34 58.3	624.2	73.56	16 16.7	59 38.6	I. N.
21	U	7 37.80	2.519	15 32 34.79	161.43	24 28 39.6	509.5	75.04	16 20.5	59 52.5	I. N.
21	L	20 8.59	2.610	16 5 25.55	166.87	−25 57 36.4	−377.1	76.31	16 23.6	60 4.2	I. N.
22	U	8 40.35	2.679	16 39 14.44	171.02	26 58 30.9	229.7	77.27	16 26.1	60 13.3	I. N.S.
22	L	21 12.76	2.718	17 13 43.03	173.40	27 28 48.9	− 72.0	77.80	16 27.8	60 19.3	I. N.S.
23	U	9 45.45	2.723	17 48 27.95	173.71	27 27 2.1	+ 89.9	77.84	16 28 5	60 21.8	I. S.
23	L	22 17.98	2.693	18 23 3.58	171.88	−26 53 1.1	+249.2	77.38	16 28.1	60 20.5	I. S.

July 22, U Defective Illumination of *S.* 0″.47.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
July 23	L	22 17.98	2.693	18 23 3.58	171.88	−26 53 1.1	+249.2	77.38	16 28.1	60 20.5	I. S.
24	U	10 49.95	2.631	18 57 5.43	168.14	25 47 59.0	399.1	76.47	16 26.7	60 15.3	I. S.
24	L	23 21.03	2.545	19 30 13.16	162.94	24 14 22.6	534.2	75.21	16 24.2	60 6.3	I. S.
25	U	11 50.96	2.443	20 2 12.53	156.83	22 15 33.0	650.8	73.73	16 20.8	59 53.6	I. S.
26	L	0 19.63	2.335	20 32 55.83	150.36	−19 55 24.1	+747.2	72.13	16 16.4	59 37.4	II. *N.* S.
26	U	12 47.01	2.229	21 2 21.39	143.94	17 18 1.9	823.1	70.52	16 11.1	59 18.1	II. N. *S.*
27	L	1 13.15	2.129	21 30 32.22	137.95	14 27 27.1	879.5	68.99	16 5.1	58 56.2	II. N.
27	U	13 38.15	2.040	21 57 34.72	132.59	11 27 24.9	918.0	67.61	15 58.6	58 32.4	II. N.
28	L	2 2.16	1.964	22 23 37.40	128.00	− 8 21 18.7	+940.6	66.41	15 51.8	58 7.2	II. N.
28	U	14 25.33	1.901	22 48 49.83	124.22	5 12 7.6	949.2	65.42	15 44.7	57 41.2	II. N.
29	L	2 47.84	1.852	23 13 22.07	121.29	− 2 2 27.8	945.7	64.65	15 37.6	57 15.1	II. N.
29	U	15 9.84	1.817	23 37 24.11	119.20	+ 1 5 25.6	931.7	64.10	15 30.5	56 49.3	II. N.
30	L	3 31.50	1.795	0 1 5.68	117.88	+ 4 9 36.0	+908.6	63.77	15 23.8	56 24.4	II. N.
30	U	15 52.98	1.786	0 24 36.09	117.32	7 8 20.1	877.5	63.64	15 17.3	56 0.8	II. N.
31	L	4 14.42	1.788	0 48 4.07	117.45	10 0 6.3	839.1	63.70	15 11.3	55 38.8	II. N.
31	U	16 35.95	1.801	1 11 37.75	118.25	12 43 30.3	793.8	63.95	15 5.9	55 18.9	II. N.
Aug. 1	L	4 57.70	1.824	1 35 24.47	119.63	+15 17 11.9	+742.1	64.35	15 1.1	55 1.3	II. N.
1	U	17 19.77	1.856	1 59 30.77	121.51	17 39 53.9	683.9	64.88	14 57.0	54 46.1	II. N.
2	L	5 42.26	1.894	2 24 2.14	123.79	19 50 19.1	619.2	65.50	14 53.5	54 33.5	II. N.
2	U	18 5.23	1.936	2 49 2.80	126.36	21 47 9.9	548.1	66.20	14 50.8	54 23.6	II. N.
3	L	6 28.74	1.982	3 14 35.45	129.09	+23 29 7.9	+470.5	66.93	14 48.9	54 16.4	II. N.
3	U	18 52.80	2.027	3 40 41.06	131.83	24 54 55.7	386.4	67.64	14 47.7	54 12.0	II. N.
4	L	7 17.39	2.070	4 7 18.61	134.39	26 3 18.1	296.3	68.30	14 47.2	54 10.2	II. N.
4	U	19 42.46	2.107	4 34 25.01	136.60	26 53 5.7	200.8	68.85	14 47.4	54 11.0	II. N.
5	L	8 7.92	2.135	5 1 55.11	138.31	+27 23 18.5	+100.7	69.26	14 48.3	54 14.3	II. N.
5	U	20 33.66	2.153	5 29 42.02	139.39	27 33 10.0	− 2.6	69.50	14 49.8	54 19.9	II. S.
6	L	8 59.54	2.160	5 57 37.56	139.75	27 22 11.2	107.4	69.55	14 51.9	54 27.6	II. S.
6	U	21 25.42	2.153	6 25 33.02	139.37	26 50 13.3	212.0	69.43	14 54.6	54 37.3	II. S.
7	L	9 51.16	2.135	6 53 19.84	138.32	+25 57 29.3	−314.7	69.12	14 57.7	54 48.7	II. S.
7	U	22 16.63	2.108	7 20 50.39	136.68	24 44 34.2	413.6	68.66	15 1.2	55 1.5	II. S.
8	L	10 41.73	2.074	7 47 58.67	134.63	23 12 22.3	507.2	68.10	15 5.0	55 15.6	II. S.
8	U	23 6.39	2.036	8 14 40.56	132.32	21 22 6.6	594.1	67.47	15 9.1	55 30.6	
9	L	11 30.57	1.996	8 40 54.13	129.93	+19 15 13.4	−673.3	66.82	15 13.3	55 46.2	
9	U	23 54.29	1.958	9 6 39.54	127.65	16 53 20.9	743.9	66.20	15 17.7	56 2.3	
10	L	12 17.58	1.924	9 31 58.92	125.63	14 18 15.3	805.4	65.66	15 22.2	56 18.7	
11	U	0 40.50	1.897	9 56 56.09	123.98	11 31 48.7	857.3	65.22	15 26.7	56 35.0	
11	L	13 3.14	1.878	10 21 36.32	122.82	+ 8 35 57.8	−899.4	64.92	15 31.1	56 51.2	
12	U	1 25.60	1.868	10 46 6.08	122.25	5 32 43.6	931.2	64.78	15 35.4	57 7.1	I. N.
12	L	13 48.01	1.869	11 10 32.79	122.34	+ 2 24 10.3	952.5	64.82	15 39.6	57 22.5	I. N.
13	U	2 10.51	1.882	11 35 4.66	123.11	− 0 47 33.7	962.9	65.06	15 43.6	57 37.3	I. N.
13	L	14 33.24	1.908	11 59 50.44	124.65	− 4 0 15.0	−962.0	65.51	15 47.5	57 51.6	I. N.
14	U	2 56.36	1.947	12 24 59.36	126.97	7 11 33.4	949.0	66.17	15 51.2	58 5.2	I. N.
14	L	15 20.01	1.998	12 50 40.79	130.07	10 19 0.4	923.3	67.03	15 54.7	58 18.0	I. N.
15	U	3 44.36	2.062	13 17 3.96	133.93	13 19 58.2	884.0	68.08	15 58.0	58 30.2	I. N.
15	L	16 9.54	2.138	13 44 17.52	138.46	−16 11 37.6	−830.1	69.28	16 1.1	58 41.6	I. N.

July 26, U Defective Illumination of *S.* 0″.27.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Aug. 15	L	16 9.54	2.138	13 44 17.52	138.46	−16 11 37.6	−830.1	69.28	16 1.1	58 41.6	I. N.
16	U	4 35.69	2.222	14 12 28.98	143.54	18 50 58.0	760.7	70.62	16 4.0	58 52.1	I. N.
16	L	17 2.89	2.312	14 41 43.70	148.96	21 14 49.3	675.1	72.01	16 6.7	59 1.8	I. N.
17	U	5 31.18	2.403	15 12 4.06	154.41	23 19 55.0	573.1	73.37	16 9.0	59 10.5	I. N.
17	L	18 0.54	2.488	15 43 28.29	159.52	−25 3 0.6	−455.2	74.62	16 11.0	59 18.0	I. N.
18	U	6 30.84	2.560	16 15 49.61	163.85	26 21 4.0	323.2	75.66	16 12.7	59 24.2	I. N.
18	L	19 1.89	2.611	16 48 55.89	166.95	27 11 31.0	179.8	76.39	16 14.0	59 28.9	I. N.
19	U	7 33.40	2.636	17 22 30.18	168.47	27 32 30.6	− 29.4	76.73	16 14.9	59 31.9	I. N.S.
19	L	20 5.04	2.632	17 56 12.15	168.22	−27 23 8.8	+122.9	76.64	16 15.2	59 33.1	I. N.S.
20	U	8 36.45	2.599	18 29 40.46	166.22	26 43 36.6	271.4	76.13	16 14.9	59 32.1	I. S.
20	L	21 7.31	2.540	19 2 35.29	162.70	25 35 9.9	411.1	75.25	16 14.0	59 28.8	I. S.
21	U	9 37.35	2.463	19 34 40.56	158.02	24 0 1.1	537.9	74.08	16 12.5	59 23.2	I. S.
21	L	22 6.37	2.373	20 5 45.17	152.66	−22 1 5.8	+648.5	72.73	16 10.3	59 15.0	I. S.
22	U	10 34.29	2.280	20 35 43.31	147.02	19 41 46.3	741.6	71.30	16 7.4	59 4.4	I. S.
22	L	23 1.09	2.188	21 4 34.01	141.47	17 5 37.6	816.8	69.86	16 3.8	58 51.4	I. S.
23	U	11 26.82	2.102	21 32 20.09	136.29	14 16 13.5	874.3	68.52	15 59.7	58 36.2	I. S.
23	L	23 51.57	2.025	21 59 7.24	131.66	−11 16 59.8	+915.2	67.30	15 55.0	58 19.0	I. *II.* N.S.
24	U	12 15.46	1.959	22 25 2.87	127.71	8 11 8.5	940.8	66.24	15 49.8	58 0.1	II. N.S.
25	L	0 38.63	1.906	22 50 15.48	124.50	5 1 35.4	952.5	65.38	15 44.3	57 39.9	II. N.
25	U	13 1.24	1.865	23 14 54.00	122.05	− 1 50 58.9	951.6	64.73	15 38.6	57 18.8	II. N.
26	L	1 23.43	1.836	23 39 7.42	120.33	+ 1 18 18.4	+939.5	64.27	15 32.7	56 57.1	II. N.
26	U	13 45.35	1.819	0 3 4.53	119.32	4 24 8.6	917.3	64.02	15 26.8	56 35.4	II. N.
27	L	2 7.14	1.814	0 26 53.72	118.99	7 24 36.4	885.9	63.96	15 21.0	56 14.1	II. N.
27	U	14 28.93	1.819	0 50 42.89	119.31	10 17 57.3	846.2	64.07	15 15.3	55 53.5	II. N.
28	L	2 50.84	1.834	1 14 39.35	120.20	+13 2 34.5	+798.8	64.35	15 10.0	55 34.1	II. N.
28	U	15 12.98	1.857	1 38 49.62	121.60	15 36 58.3	744.0	64.78	15 5.2	55 16.2	II. N.
29	L	3 35.44	1.888	2 3 19.35	123.43	17 59 43.0	682.2	65.30	15 0.8	55 0.1	II. N.
29	U	15 58.31	1.924	2 28 13.12	125.59	20 9 26.5	613.8	65.92	14 57.0	54 46.2	II. N.
30	L	4 21.62	1.963	2 53 34.22	127.96	+22 4 49.1	+538.9	66.59	14 53.8	54 34.6	II. N.
30	U	16 45.42	2.004	3 19 24.50	130.42	23 44 34.5	457.7	67.27	14 51.3	54 25.4	II. N.
31	L	5 9.71	2.044	3 45 44.07	132.81	25 7 30.1	370.6	67.91	14 49.5	54 18.9	II. N.
31	U	17 34.46	2.080	4 12 31.24	134.99	26 12 28.3	278.2	68.50	14 48.5	54 15.2	II. N.
Sept. 1	L	5 59.61	2.110	4 39 42.50	136.80	+26 58 29.8	+181.3	68.97	14 48.3	54 14.3	II. N.
1	U	18 25.07	2.131	5 7 12.64	138.12	27 24 45.9	+ 80.8	69.31	14 48.8	54 16.1	II. N.
2	L	6 50.73	2.144	5 34 55.11	138.86	27 30 41.4	− 22.0	69.48	14 50.1	54 20.7	II. N.
2	U	19 16.48	2.146	6 2 42.49	138.95	27 15 56.8	125.5	69.48	14 52.0	54 27.9	II. S.
3	L	7 42.18	2.137	6 30 27.18	138.41	+26 40 30.7	−228.5	69.32	14 54.7	54 37.7	II. S.
3	U	20 7.72	2.118	6 58 1.96	137.30	25 44 39.7	329.4	69.00	14 58.0	54 49.9	II. S.
4	L	8 33.00	2.092	7 25 20.73	135.76	24 28 57.9	426.8	68.56	15 1.9	55 4.2	II. S.
4	U	20 57.93	2.062	7 52 18.78	133.90	22 54 16.5	519.2	68.03	15 6.3	55 20.4	II. S.
5	L	9 22.46	2.028	8 18 53.30	131.87	+21 1 40.8	−605.6	67.46	15 11.2	55 38.2	II. S.
5	U	21 46.59	1.994	8 45 3.38	129.84	18 52 28.8	685.1	66.88	15 16.3	55 57.2	II. S.
6	L	10 10.33	1.963	9 10 49.93	127.96	16 28 9.6	756.7	66.36	15 21.8	56 17.1	II. S
6	U	22 33.72	1.937	9 36 15.62	126.37	13 50 21.4	819.8	65.90	15 27.3	56 37.5	II. S.
7	L	10 56.84	1.917	10 1 24.61	125.20	+11 0 51.2	−873.6	65.56	15 32.9	56 57.9	II. S.

Aug. 19, U Defective Illumination of *S.* 0″.14.

Aug. 24, U Defective Illumination of *S.* 0″.[illegible]

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

ate.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
pt. 7	L	10 56.84	1.917	10 1 24.61	125.20	+11 0 51.2	−873.6	65.56	15 32.9	56 57.9	II. S.
7	U	23 19.77	1.906	10 26 22.36	124.53	8 1 33.7	917.6	65.36	15 38.4	57 18.1	
8	L	11 42.62	1.904	10 51 15.34	124.42	4 54 31.9	950.9	65.33	15 43.7	57 37.7	
9	U	0 5.51	1.913	11 16 10.96	124.97	+ 1 41 57.9	972.8	65.48	15 48.8	57 56.2	
9	L	12 28.58	1.934	11 41 17.23	126.21	− 1 33 47.6	−982.6	65.81	15 53.4	58 13.3	
10	U	0 51.97	1.966	12 6 42.67	128.16	4 50 13.8	979.5	66.35	15 57.7	58 28.8	
10	L	13 15.82	2.011	12 32 36.01	130.85	8 4 39.8	962.5	67.09	16 1.4	58 42.5	I. N.
11	U	1 40.28	2.068	12 59 5.91	134.24	11 14 14.4	930.7	68.01	16 4.6	58 54.2	I. N.
11	L	14 5.48	2.135	13 26 20.51	138.29	−14 15 55.1	−883.3	69.09	16 7.2	59 3.9	I. N.
12	U	2 31.55	2.210	13 54 26.91	142.86	17 6 30.8	819.8	70.30	16 9.3	59 11.5	I. N.
12	L	14 58.56	2.292	14 23 30.41	147.77	19 42 43.3	739.5	71.57	16 10.8	59 17.0	I. N.
13	U	3 26.57	2.375	14 53 33.62	152.75	22 1 12.3	642.6	72.85	16 11.8	59 20.6	I. N.
13	L	15 55.55	2.454	15 24 35.53	157.48	−23 58 42.4	−529.9	74.05	16 12.3	59 22.4	I. N.
14	U	4 25.42	2.522	15 56 30.70	161.56	25 32 13.2	403.1	75.06	16 12.3	59 22.4	I. N.
14	L	16 56.00	2.572	16 29 8.85	164.59	26 39 11.6	265.0	75.81	16 11.9	59 20.9	I. N.
15	U	5 27.05	2.599	17 2 15.33	166.23	27 17 44.6	−119.6	76.21	16 11.0	59 17.9	I. N.
15	L	17 58.27	2.600	17 35 32.02	166.28	−27 26 50.8	+ 28.7	76.23	16 9.9	59 13.6	I. N. *S.*
16	U	6 29.34	2.574	18 8 39.52	164.71	27 6 26.3	174.7	75.84	16 8.3	59 8.0	I. *N.* S.
16	L	18 59.94	2.524	18 41 19.22	161.69	26 17 26.1	313.9	75.09	16 6.5	59 1.3	I. S.
17	U	7 29.83	2.454	19 13 15.40	157.52	25 1 36.5	442.4	74.06	16 4.4	58 53.6	I. S.
17	L	19 58.80	2.372	19 44 16.56	152.59	−23 21 24.5	+557.2	72.82	16 2.0	58 44.7	I. S.
18	U	8 26.74	2.284	20 14 16.00	147.29	21 19 43.4	656.9	71.46	15 59.3	58 34.7	I. S.
18	L	20 53.62	2.196	20 43 11.54	141.98	18 59 40.8	740.8	70.08	15 56.3	58 23.7	I. S.
19	U	9 19.47	2.112	21 11 4.83	136.95	16 24 27.4	808.8	68.75	15 53.0	58 11.6	I. S.
19	L	21 44.35	2.037	21 38 0.35	132.40	−13 37 10.5	+861.5	67.52	15 49.4	57 58.5	I. S.
20	U	10 8.39	1.971	22 4 4.61	128.43	10 40 48.3	899.8	66.44	15 45.6	57 44.4	I. S.
20	L	22 31.70	1.916	22 29 25.32	125.14	7 38 8.3	924.6	65.53	15 41.5	57 29.4	I. S.
21	U	10 54.42	1.874	22 54 10.85	122.57	4 31 46.3	936.9	64.81	15 37.2	57 13.7	I. S.
21	L	23 16.70	1.842	23 18 29.75	120.71	− 1 24 7.2	+937.6	64.28	15 32.7	56 57.2	I. *N.* S.
22	U	11 38.68	1.823	23 42 30.51	119.54	+ 1 42 34.7	927.5	63.96	15 28.1	56 40.3	I. N. *S.*
23	L	0 0.50	1.815	0 6 21.30	119.05	4 46 14.1	907.3	63.82	15 23.4	56 23.1	*I.* II. N.
23	U	12 22.28	1.817	0 30 9.89	119.17	7 44 54.2	877.7	63.86	15 18.7	56 5.9	II. N.
24	L	0 44.14	1.828	0 54 3.49	119.87	+10 36 44.3	+839.1	64.06	15 14.1	55 48.9	II. N.
24	U	13 6.20	1.848	1 18 8.60	121.08	13 20 0.1	792.1	64.42	15 9.6	55 32.4	II. N.
25	L	1 28.54	1.876	1 42 30.89	122.72	15 53 1.9	736.9	64.89	15 5.3	55 16.8	II. N.
25	U	13 51.24	1.909	2 7 15.07	124.70	18 14 14.7	674.0	65.46	15 1.4	55 2.2	II. N.
26	L	2 14.36	1.946	2 32 24.60	126.91	+20 22 7.8	+603.7	66.09	14 57.7	54 48.9	II. N.
26	U	14 37.94	1.984	2 58 1.58	129.24	22 15 15.4	526.4	66.75	14 54.6	54 37.3	II. N.
27	L	3 1.99	2.023	3 24 6.51	131.55	23 52 17.8	442.9	67.40	14 51.9	54 27.6	II. N.
27	U	15 26.48	2.058	3 50 38.20	133.69	25 12 2.0	353.6	68.00	14 49.9	54 20.0	II. N.
28	L	3 51.36	2.088	4 17 33.68	135.50	+26 13 25.1	+259.5	68.51	14 48.4	54 14.7	II. N.
28	U	16 16.57	2.111	4 44 48.41	136.87	26 55 35.3	161.7	68.90	14 47.6	54 11.8	II. N.
29	L	4 42.00	2.125	5 12 16.45	137.71	27 17 54.6	+ 61.3	69.14	14 47.6	54 11.6	II. N.
29	U	17 7.53	2.129	5 39 50.94	137.95	27 20 0.6	− 40.3	69.22	14 48.3	54 14.2	II. N. *S.*
30	L	5 33.05	2.123	6 7 24.68	137.58	+27 1 47.3	−141.8	69.13	14 49.7	54 19.5	II. *N.* S.

Sept. 16, U Defective Illumination of *N.* 0″.34.
Sept. 22, U Defective Illumination of *S.* 0″.22.

Sept. 29. U Defective Illumination of *S.* 0″.93.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limb.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Sept. 30	L	5 33.05	2.123	6 7 24.68	137.58	+27 1 47.3	−141.8	69.13	14 49.7	54 19.5	II. N.
30	U	17 58.44	2.108	6 34 50.80	136.67	26 23 24.9	241.7	68.90	14 51.9	54 27.5	II.
Oct. 1	L	6 23.61	2.085	7 2 3.17	135.31	25 25 19.2	338.8	68.53	14 54.8	54 38.3	II.
1	U	18 48.47	2.057	7 28 57.04	133.61	24 8 10.4	432.0	68.07	14 58.5	54 51.9	II.
2	L	7 12.97	2.026	7 55 29.32	131.73	+22 32 50.0	−520.5	67.56	15 2.9	55 8.0	II.
2	U	19 37.09	1.994	8 21 38.71	129.83	20 40 20.1	603.5	67.03	15 8.0	55 26.4	II.
3	L	8 0.83	1.964	8 47 25.71	128.04	18 31 50.5	680.3	66.51	15 13.5	55 46.9	II.
3	U	20 24.24	1.938	9 12 52.49	126.49	16 8 38.7	750.4	66.06	15 19.6	56 9.2	II.
4	L	8 47.38	1.919	9 38 2.83	125.31	+13 32 9.4	−813.1	65.71	15 26.1	56 33.0	II.
4	U	21 10.33	1.907	10 3 1.76	124.60	10 43 54.2	867.8	65.48	15 32.8	56 57.7	II.
5	L	9 33.19	1.905	10 27 55.49	124.46	7 45 34.3	913.8	65.41	15 39.7	57 23.0	II.
5	U	21 56.09	1.913	10 52 51.21	124.96	4 39 0.3	950.1	65.51	15 46.6	57 48.3	II.
6	L	10 19.15	1.932	11 17 56.81	126.11	+ 1 26 15.2	−975.5	65.81	15 53.4	58 13.0	II.
6	U	22 42.51	1.964	11 43 20.86	128.03	− 1 50 23.1	988.7	66.30	15 59.8	58 36.5	II.
7	L	11 6.33	2.008	12 9 12.32	130.68	5 8 21.2	988.5	66.99	16 5.7	58 58.3	
7	U	23 30.76	2.065	12 35 40.27	134.10	8 24 47.8	973.3	67.88	16 11.0	59 17.9	
8	L	11 55.94	2.134	13 2 53.52	138.23	−11 36 33.6	−941.5	68.95	16 15.6	59 34.7	
9	U	0 22.01	2.212	13 31 0.08	142.96	14 40 12.2	891.9	70.17	16 19.4	59 48.5	
9	L	12 49.07	2.299	14 0 6.40	148.15	17 32 3.0	823.4	71.49	16 22.2	59 58.8	I. N.
10	U	1 17.19	2.388	14 30 16.39	153.51	20 8 15.7	735.6	72.85	16 24.0	60 5.6	I. N.
10	L	13 46.37	2.475	15 1 30.24	158.73	−22 25 0.4	−628.9	74.16	16 24.9	60 8.8	I. N.
11	U	2 16.54	2.552	15 33 43.86	163.38	24 18 38.9	504.9	75.31	16 24.8	60 8.6	I. N.
11	L	14 47.54	2.612	16 6 47.34	166.98	25 45 59.7	366.5	76.20	16 23.9	60 5.0	I. N.
12	U	3 19.12	2.648	16 40 25.78	169.15	26 44 34.7	218.1	76.76	16 22.1	59 58.5	I. N.
12	L	15 50.97	2.655	17 14 19.99	169.58	−27 12 54.4	− 64.9	76.89	16 19.6	59 49.3	I. N.
13	U	4 22.72	2.632	17 48 8.55	168.22	27 10 35.5	+ 87.4	76.60	16 16.5	59 37.9	I. N.
13	L	16 54.03	2.581	18 21 30.40	165.17	26 38 22.8	233.2	75.89	16 12.9	59 24.8	I.
14	U	5 24.59	2.508	18 54 7.26	160.78	25 38 1.2	368.2	74.84	16 8.9	59 10.2	I.
14	L	17 54.17	2.420	19 25 45.46	155.46	−24 12 2.4	+489.1	73.55	16 4.7	58 54.7	I.
15	U	6 22.64	2.324	19 56 16.74	149.69	22 23 26.5	594.1	72.12	16 0.3	58 38.5	I.
15	L	18 49.95	2.227	20 25 37.98	143.86	20 15 27.8	682.9	70.63	15 55.8	58 22.0	I.
16	U	7 16.11	2.135	20 53 50.47	138.28	17 51 20.6	755.7	69.19	15 51.3	58 5.3	I.
16	L	19 41.21	2.050	21 20 58.79	133.20	−15 14 12.0	+813.3	67.83	15 46.7	57 48.5	I.
17	U	8 5.36	1.976	21 47 9.85	128.76	12 26 56.1	857.0	66.62	15 42.2	57 31.9	I.
17	L	20 28.69	1.914	22 12 31.88	125.04	9 32 13.4	888.0	65.59	15 37.7	57 15.5	I.
18	U	8 51.36	1.865	22 37 13.80	122.08	6 32 31.3	907.2	64.75	15 33.3	56 59.4	I.
18	L	21 13.51	1.829	23 1 24.80	119.88	− 3 30 4.4	+915.6	64.12	15 29.0	56 43.5	I.
19	U	9 35.30	1.805	23 25 13.93	118.43	− 0 26 58.2	913.8	63.68	15 24.7	56 27.9	I.
19	L	21 56.87	1.792	23 48 49.94	117.69	+ 2 34 50.4	902.5	63.44	15 20.6	56 12.7	I.
20	U	10 18.36	1.791	0 12 21.13	117.61	5 33 29.5	882.2	63.39	15 16.5	55 57.9	I.
20	L	22 39.90	1.800	0 35 55.24	118.16	+ 8 27 11.6	+853.2	63.53	15 12.6	55 43.4	I. N.
21	U	11 1.60	1.819	0 59 39.35	119.27	11 14 12.1	815.4	63.82	15 8.8	55 29.4	I. N.
21	L	23 23.58	1.845	1 23 39.73	120.86	13 52 48.5	769.2	64.24	15 5.1	55 16.0	I. N.
22	U	11 45.91	1.878	1 48 1.64	122.84	16 21 19.5	714.6	64.78	15 1.7	55 3.3	*I.* II. N.
23	L	0 8.67	1.916	2 12 49.20	125.11	+18 38 6.8	+651.9	65.39	14 58.4	54 51.4	II. N.

Oct. 22, U Defective Illumination of *I.* 0″.00.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

ate.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
t. 23	U	12 31.90	1.956	2 38 5.16	127.56	+20 41 33.9	+581.3	66.07	14 55.4	54 40.4	II. N.
24	L	0 55.62	1.997	3 3 50.65	130.02	22 30 9.5	503.4	66.74	14 52.7	54 30.5	II. N.
24	U	13 19.82	2.035	3 30 5.02	132.34	24 2 28.6	418.8	67.39	14 50.4	54 21.9	II. N.
25	L	1 44.46	2.070	3 56 45.69	134.37	25 17 16.0	328.3	67.95	14 48.4	54 14.8	II. N.
25	U	14 9.46	2.096	4 23 48.31	135.97	+26 13 28.1	+233.1	68.40	14 46.9	54 9.3	II. N.
26	L	2 34.73	2.113	4 51 6.92	137.01	26 50 17.1	134.7	68.72	14 46.0	54 5.7	II. N.
26	U	15 0.15	2.120	5 18 34.33	137.43	27 7 12.4	+ 34.5	68.86	14 45.5	54 4.1	II. N.
27	L	3 25.58	2.117	5 46 2.82	137.21	27 4 1.9	− 66.0	68.84	14 45.7	54 4.7	II. N.
27	U	15 50.91	2.102	6 13 24.67	136.34	+26 40 52.2	−165.2	68.65	14 46.5	54 7.7	II. N. *S.*
28	L	4 16.00	2.079	6 40 32.87	134.94	25 58 7.6	261.7	68.32	14 48.0	54 13.1	II. *N.* S.
28	U	16 40.78	2.049	7 7 21.76	133.14	24 56 27.2	354.3	67.87	14 50.2	54 21.1	II. S.
29	L	5 5.17	2.015	7 33 47.34	131.09	23 36 42.4	442.3	67.35	14 53.1	54 31.8	II. S.
29	U	17 29.13	1.979	7 59 47.46	128.94	+21 59 53.1	−525.0	66.78	14 56.7	54 45.2	II. S.
30	L	5 52.67	1.945	8 25 22.01	126.86	20 7 6.0	601.9	66.23	15 1.1	55 1.2	II. S.
30	U	18 15.81	1.913	8 50 32.62	124.98	17 59 31.5	672.8	65.72	15 6.2	55 19.8	II. S.
31	L	6 38.61	1.888	9 15 22.65	123.44	15 38 23.1	737.5	65.29	15 11.9	55 40.8	II. S.
31	U	19 1.15	1.870	9 39 56.87	122.36	+13 4 56.7	−795.8	64.98	15 18.2	56 4.1	II. S.
ov. 1	L	7 23.53	1.861	10 4 21.36	121.83	10 20 32.0	847.2	64.81	15 25.1	56 29.5	II. S.
1	U	19 45.86	1.863	10 28 43.23	121.94	7 26 33.9	891.3	64.82	15 32.5	56 56.5	II. S.
2	L	8 8.28	1.876	10 53 10.51	122.75	4 24 34.7	927.2	65.01	15 40.2	57 24.7	II. S.
2	U	20 30.94	1.902	11 17 52.05	124.32	+ 1 16 18.2	−953.9	65.40	15 48.0	57 53.7	II. S.
3	L	8 54.00	1.942	11 42 57.32	126.70	− 1 56 17.3	970.2	66.01	15 56.0	58 22.8	II. S.
3	U	21 17.61	1.996	12 8 36.29	129.93	5 10 55.8	974.2	66.85	16 3.8	58 51.4	II. S.
4	L	9 41.95	2.064	12 34 59.18	134.02	8 24 58.8	963.9	67.90	16 11.3	59 18.8	II. S.
4	U	22 7.19	2.145	13 2 15.99	138.92	−11 35 23.5	−937.3	69.14	16 18.2	59 44.2	II. S.
5	L	10 33.48	2.238	13 30 36.01	144.53	14 38 40.7	892.3	70.55	16 24.4	60 6.9	II. S.
5	U	23 0.95	2.341	14 0 6.81	150.67	17 30 57.0	826.9	72.08	16 29.6	60 26.1	
6	L	11 29.67	2.447	14 30 53.07	157.04	20 7 59.1	739.8	73.64	16 33.8	60 41.3	
6	U	23 59.65	2.549	15 2 55.21	163.23	−22 25 24.4	−630.8	75.14	16 36.7	60 52.0	
7	L	12 30.81	2.640	15 36 7.87	168.70	24 18 57.1	501.4	76.45	16 38.3	60 57.8	
8	U	1 2.93	2.710	16 10 19.00	172.89	25 44 48.9	354.8	77.45	16 38.5	60 58.7	I. N.
8	L	13 35.72	2.749	16 45 9.93	175.27	26 40 3.7	196.2	78.03	16 37.4	60 54.8	I. N.
9	U	2 8.77	2.753	17 20 16.76	175.50	−27 2 57.3	− 32.5	78.13	16 35.1	60 46.3	I. N.
9	L	14 41.65	2.721	17 55 13.14	173.53	26 53 12.6	+128.9	77.70	16 31.7	60 33.7	I. N.
10	U	3 13.94	2.655	18 29 33.82	169.61	26 11 57.8	281.4	76.81	16 27.3	60 17.5	I. N.
10	L	15 45.28	2.565	19 2 57.82	164.18	25 1 34.8	419.6	75.55	16 22.1	59 58.4	I. S.
11	U	4 15.43	2.459	19 35 10.40	157.81	−23 25 17.8	+540.1	74.04	16 16.3	59 37.1	I. S.
11	L	16 44.27	2.347	20 6 3.67	151.05	21 26 49.3	641.5	72.40	16 10.1	59 14.3	I. S.
12	U	5 11.76	2.236	20 35 35.97	144.38	19 9 58.8	723.9	70.74	16 3.6	58 50.6	I. S.
12	L	17 37.96	2.132	21 3 50.52	138.14	16 38 27.0	788.5	69.14	15 57.0	58 26.5	I. S.
13	U	6 2.98	2.040	21 30 53.98	132.56	−13 55 37.8	+837.0	67.69	15 50.5	58 2.5	I. S.
13	L	18 26.97	1.960	21 56 55.19	127.78	11 4 32.7	871.0	66.41	15 44.1	57 39.1	I. S.
14	U	6 50.08	1.895	22 22 4.05	123.84	8 7 53.0	892.9	65.33	15 37.9	57 16.4	I. S.
14	L	19 12.49	1.844	22 46 30.92	120.78	5 7 59.4	904.0	64.46	15 32.0	56 54.7	I. S.
15	U	7 34.38	1.807	23 10 26.06	118.56	− 2 6 56.8	+905.0	63.84	15 26.4	56 34.2	I. S.

Oct. 27, U Defective Illumination of *S*. 0″.01.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

Date.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limb.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
Nov. 15	L	19 55.91	1.783	23 33 59.46	117.16	+ 0 53 22.3	+896.9	63.42	15 21.2	56 14.9	I. S.
16	U	8 17.23	1.773	23 57 20.57	116.51	3 51 15.0	880.6	63.20	15 16.3	55 56.9	I. S.
16	L	20 38.49	1.774	0 20 38.27	116.58	6 45 3.9	856.3	63.19	15 11.8	55 40.3	I. S.
17	U	8 59.84	1.786	0 44 0.80	117.29	9 33 14.8	824.3	63.36	15 7.6	55 25.0	I. S.
17	L	21 21.39	1.807	1 7 35.55	118.59	+12 14 15.5	+784.5	63.69	15 3.8	55 11.0	I. S.
18	U	9 43.25	1.837	1 31 29.02	120.40	14 46 32.6	737.0	64.15	15 0.3	54 58.3	I. S.
18	L	22 5.51	1.874	1 55 46.65	122.61	17 8 32.4	681.6	64.72	14 57.1	54 46.7	I. S.
19	U	10 28.24	1.915	2 20 32.56	125.09	19 18 41.2	618.4	65.37	14 54.3	54 36.4	I. N. S.
19	L	22 51.49	1.959	2 45 49.30	127.71	+21 15 24.8	+547.5	66.06	14 51.8	54 27.2	I. N. S.
20	U	11 15.26	2.002	3 11 37.66	130.33	22 57 12.1	469.1	66.74	14 49.6	54 19.1	I. N. S.
20	L	23 39.53	2.043	3 37 56.40	132.75	24 22 37.6	384.0	67.38	14 47.8	54 12.3	I. *II.* N.
21	U	12 4.25	2.077	4 4 42.18	134.81	25 30 24.7	292.9	67.92	14 46.3	54 6.7	II. N.
22	L	0 29.34	2.102	4 31 49.72	136.35	+26 19 29.9	+197.2	68.33	14 45.1	54 2.4	II. N.
22	U	12 54.67	2.117	4 59 11.98	137.24	26 49 6.4	+ 98.4	68.58	14 44.3	53 59.5	II. N.
23	L	1 20.11	2.120	5 26 40.74	137.43	26 58 47.3	− 1.8	68.65	14 43.9	53 58.1	II. N.
23	U	13 45.51	2.111	5 54 7.27	136.88	26 48 26.6	101.6	68.53	14 43.9	53 58.2	II. N.
24	L	2 10.73	2.091	6 21 23.10	135.66	+26 18 19.9	−199.2	68.25	14 44.4	54 0.0	II. N. S.
24	U	14 35.66	2.061	6 48 20.80	133.88	25 29 2.3	293.1	67.82	14 45.4	54 3.7	II. N. S.
25	L	3 0.18	2.025	7 14 54.39	131 66	24 21 24.8	382.3	67.27	14 46.9	54 9.3	II. S.
25	U	15 24.23	1.984	7 40 59.97	129.22	22 56 31.3	465.7	66.67	14 49.0	54 17.0	II. S.
26	L	3 47.79	1.942	8 6 35.67	126.73	+21 15 34.0	−542.8	66.03	14 51.7	54 26.9	II. S.
26	U	16 10.86	1.903	8 31 41.73	124.33	19 19 49.5	613.5	65.41	14 55.0	54 39.0	II. S.
27	L	4 33.47	1.867	8 56 20.32	122.17	17 10 36.5	677.6	64.86	14 59.0	54 53.5	II. S.
27	U	16 55.69	1.837	9 20 35.25	120.40	14 49 13.9	735.1	64.40	15 3.6	55 10.4	II. S.
28	L	5 17.60	1.816	9 44 31.83	119.13	+12 17 0.1	−786.1	64.06	15 8.8	55 29.7	II. S.
28	U	17 39.31	1.805	10 8 16.57	118.44	9 35 13.2	830.7	63.88	15 14.7	55 51.3	II. S.
29	L	6 0.96	1.804	10 31 56.97	118.42	6 45 12.1	868.4	63.88	15 21.2	56 15.1	II. S.
29	U	18 22.67	1.816	10 55 41.51	119.13	3 48 20.1	899.0	64.08	15 28.3	56 40.9	II. S.
30	L	6 44.60	1.842	11 19 39.38	120.65	+ 0 46 6.2	−921.8	64.49	15 35.8	57 8.4	II. S.
30	U	19 6.92	1.881	11 44 0.58	123.04	− 2 19 49.7	935.8	65.12	15 43.7	57 37.4	II. S.
Dec. 1	L	7 29.80	1.935	12 8 55.64	126.31	5 27 33.5	939.6	65.98	15 51.8	58 7.3	II. S.
1	U	19 53.43	2.005	12 34 35.56	130.51	8 34 51.9	931.2	67.08	16 0.1	58 37.6	II. S.
2	L	8 17.99	2.090	13 1 11.45	135.63	−11 39 7.9	−908.7	68.39	16 8.3	59 7.7	II. S.
2	U	20 43.66	2.190	13 28 54.02	141.59	14 37 16.9	869.7	69.90	16 16.2	59 36.7	II. S.
3	L	9 10.59	2.301	13 57 52.75	148.27	17 25 44.5	811.5	71.56	16 23.6	60 4.0	II. S.
3	U	21 38.91	2.419	14 28 14.68	155.41	20 0 28.4	732.0	73.29	16 30.3	60 28.7	II. S.
4	L	10 8.66	2.538	15 0 2.84	162.58	−22 17 4.1	−630.1	75.01	16 36.1	60 49.8	II. S.
4	U	22 39.80	2.649	15 33 14.45	169.22	24 10 59.0	505.5	76.57	16 40.7	61 6.7	II. N.
5	L	11 12.16	2.740	16 7 39.50	174.69	25 37 53.7	360.6	77.84	16 44.0	61 18.7	
5	U	23 45.44	2.801	16 42 59.99	178.35	26 34 9.2	199.9	78.68	16 45.8	61 25.3	
6	L	12 19.22	2.823	17 18 50.89	179.71	−26 57 16.4	− 30.4	79.00	16 46.0	61 26.3	
7	U	0 53.02	2.804	17 54 43.08	178.56	26 46 17.8	+139.5	78.74	16 44.7	61 21.5	I. N.
7	L	13 26.36	2.746	18 30 6.96	175.05	26 1 58.2	301.7	77.95	16 41.9	61 11.3	I. N.
8	U	1 58.80	2.656	19 4 36.93	169.66	24 46 34.4	449.2	76.72	16 37.8	60 56.1	I. S.
8	L	14 30.03	2.546	19 37 54.09	163.03	−23 3 34.7	+577.2	75.17	16 32.5	60 36.7	I. S.

Nov. 19, U Defective Illumination of *N.* 0″.19.
Nov. 20, U Defective Illumination of *S.* 0″.92.

Nov. 24, U Defective Illumination of *N.* 0″.15.

AT TRANSIT OF MOON'S CENTER OVER THE MERIDIAN OF WASHINGTON.

ate.	Culmination.	Mean Time of Transit.	Diff. for 1 Hour of Long.	Right Ascension of Center.	Diff. for 1 Hour of Long.	Geocentric Declination of Center.	Diff. for 1 Hour of Long.	Sid. Time of Semid. Passing Meridian.	Geocentric Semidiameter.	Equatorial Horizontal Parallax.	Bright Limbs.
		h m	m	h m s	s	° ′ ″	″	s	′ ″	′ ″	
c. 9	U	2 59.87	2.426	20 9 47.52	155.82	−20 57 9.0	+683.4	73.45	16 26.2	60 13.7	I. S.
9	L	15 28.25	2.306	20 40 13.66	148.58	18 31 41.3	767.6	71.69	16 19.2	59 47.9	I. S.
10	U	3 55.23	2.192	21 9 15.01	141.74	15 51 28.7	831.1	69.99	16 11.7	59 20.3	I. S.
10	L	16 20.91	2.090	21 36 58.28	135.60	13 0 27.5	876.1	68.44	16 3.9	58 51.5	I. S.
11	U	4 45.45	2.002	22 3 32.79	130.30	−10 2 6.0	+904.9	67.06	15 55.9	58 22.4	I. S.
11	L	17 9.02	1.929	22 29 9.19	125.93	6 59 25.0	919.8	65.91	15 48.1	57 53.6	I. S.
12	U	5 31.81	1.872	22 53 58.63	122.49	3 54 58.2	922.8	64.98	15 40.4	57 25.4	I. S.
12	L	17 54.00	1.830	23 18 12.18	119.95	− 0 50 57.9	915.7	64.28	15 33.0	56 58.5	I. S.
13	U	6 15.78	1.802	23 42 0.55	118.27	+ 2 10 42.4	+899.7	63.81	15 26.1	56 33.2	I. S.
13	L	18 37.30	1.788	0 5 33.84	117.41	5 8 22.3	875.8	63.57	15 19.7	56 9.6	I. S.
14	U	6 58.73	1.786	0 29 1.47	117.31	8 0 30.9	844.5	63.53	15 13.8	55 47.9	I. S.
14	L	19 20.21	1.796	0 52 32.11	117.91	10 45 42.3	806.2	63.66	15 8.4	55 28.2	I. S.
15	U	7 41.87	1.816	1 16 13.60	119.11	+13 22 33.8	+761.1	63.97	15 3.6	55 10.6	I. S.
15	L	20 3.83	1.845	1 40 12.78	120.84	15 49 43.2	709.2	64.42	14 59.4	54 55.1	I. S.
16	U	8 26.17	1.880	2 4 35.33	123.00	18 5 47.3	650.3	64.97	14 55.7	54 41.6	I. S.
16	L	20 48.98	1.921	2 29 25.60	125.44	20 9 21.9	584.3	65.60	14 52.6	54 30.0	I. S.
17	U	9 12.29	1.964	2 54 46.34	128.04	+21 59 2.3	+511.3	66.26	14 49.9	54 20.3	I. S.
17	L	21 36.12	2.007	3 20 38.37	130.62	23 33 25.0	431.4	66.91	14 47.8	54 12.4	I. S.
18	U	10 0.45	2.047	3 47 0.45	133.01	24 51 10.2	345.2	67.51	14 46.1	54 6.2	I. *N*. S.
18	L	22 25.22	2.081	4 13 49.21	135.03	25 51 6.4	253.4	68.00	14 44.8	54 1.6	I. N. *S*.
19	U	10 50.35	2.105	4 40 59.18	136.53	+26 32 13.6	+157.2	68.37	14 44.0	53 58.5	I. N. *S*.
19	L	23 15.70	2.119	5 8 23.12	137.34	26 53 48.2	+ 58.2	68.57	14 43.6	53 56.9	I. N.
20	U	11 41.15	2.121	5 35 52.55	137.43	26 55 26.1	− 41.9	68.58	14 43.5	53 56.7	I. N.
21	L	0 6.54	2.110	6 3 18.48	136.77	26 37 4.9	141.4	68.41	14 43.8	53 57.8	*I*. II. N. *S*.
21	U	12 31.73	2.087	6 30 32.20	135.41	+25 59 4.3	−238.3	68.06	14 44.5	54 0.2	II. N. *S*.
22	L	0 56.59	2.055	6 57 26.02	133.46	25 2 4.5	331.0	67.57	14 45.5	54 4.0	II. N. *S*.
22	U	13 21.02	2.015	7 23 53.84	131.10	23 47 3.7	418.2	66.97	14 46.9	54 9.2	II. *N*. S.
23	L	1 44.94	1.972	7 49 51.58	128.49	22 15 13.1	499.0	66.30	14 48.7	54 15.8	II. S.
23	U	14 8.34	1.927	8 15 17.32	125.79	+20 27 54.2	−572.8	65.61	14 50.9	54 23.8	II. S.
24	L	2 31.20	1.884	8 40 11.17	123.20	18 26 33.2	639.3	64.94	14 53.5	54 33.4	II. S.
24	U	14 53.57	1.845	9 4 35.25	120.86	16 12 39.4	698.4	64.34	14 56.6	54 44.6	II. S.
25	L	3 15.50	1.812	9 28 33.28	118.89	13 47 41.4	750.0	63.83	15 0.1	54 57.5	II. S.
25	U	15 37.09	1.787	9 52 10.43	117.39	+11 13 6.6	−794.5	63.45	15 4.1	55 12.2	II. S.
26	L	3 58.44	1.772	10 15 33.04	116.47	8 30 21.0	831.9	63.23	15 8.6	55 28.7	II. S.
26	U	16 19.67	1.768	10 38 48.45	116.20	5 40 49.7	862.2	63.18	15 13.6	55 47.0	II. S.
27	L	4 40.91	1.775	11 2 4.81	116.66	+ 2 45 58.4	885.2	63.33	15 19.0	56 7.1	II. S.
27	U	17 2.32	1.795	11 25 31.08	117.87	− 0 12 44.0	−900.7	63.69	15 25.0	56 29.0	II. S.
28	L	5 24.05	1.829	11 49 16.90	119.91	3 13 42.8	907.8	64.26	15 31.4	56 52.6	II. S.
28	U	17 46.28	1.878	12 13 32.41	122.83	6 15 13.4	905.7	65.07	15 38.3	57 17.7	II. S.
29	L	6 9.18	1.941	12 38 28.32	126.65	9 15 18.3	893.2	66.11	15 45.5	57 44.0	II. S.
29	U	18 32.93	2.020	13 4 15.54	131.38	−12 11 41.7	−868.5	67.36	15 52.9	58 11.2	II. S.
30	L	6 57.71	2.113	13 31 4.85	136.97	15 1 45.9	829.6	68.81	16 0.4	58 38.9	II. S.
30	U	19 23.69	2.219	13 59 6.19	143.36	17 42 27.9	774.5	70.44	16 8.0	59 6.6	II. S.
31	L	7 51.00	2.335	14 28 27.79	150.31	20 10 19.2	700.8	72.16	16 15.3	59 33.6	II. S.
31	U	20 19.73	2.454	14 59 14.67	157.51	−22 21 26.6	−606.9	73.91	16 22.3	59 59.2	II. S.

Dec. 18, U Defective Illumination of *N*. 0″.23.
Dec. 19, U Defective Illumination of *S*. 0″.39.
Dec. 21, U Defective Illumination of *S*. 0″.46.
Dec. 22, U Defective Illumination of *N*. 0″.14.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″
Jan. 0	23 54	18 34 44.30	−24 49 5.9	6.1	2.3	0.17	Feb. 16	0 47	22 29 11.19	− 6 2 47.9	12.6	4.8
1	23 57	18 41 48.45	24 46 53.8	6.1	2.3	0.17	17	0 40	22 26 12.23	6 9 19.3	12.9	4.9
3	0 0	18 48 53.75	24 43 14.4	6.1	2.3	0.17	18	0 32	22 22 48.15	6 20 12.4	13.2	5.0
4	0 3	18 56 0.07	24 38 6.7	6.1	2.3	0.17	19	0 25	22 19 4.19	6 35 4.7	13.4	5.1
5	0 6	19 3 7.30	24 31 29.7	6.1	2.3	0.17	20	0 17	22 15 6.15	6 53 27.4	13.6	5.2
6	0 10	19 10 15.30	−24 23 22.5	6.2	2.3	0.17	21	0 9	22 11 0.15	− 7 14 46.7	13.7	5.2
7	0 13	19 17 23.93	24 13 44.1	6.2	2.3	0.17	22	0 1	22 6 52.35	7 38 25.7	13.8	5.3
8	0 16	19 24 33.06	24 2 33.6	6.2	2.3	0.17	22	23 53	22 2 48.68	8 3 46.0	13.9	5.3
9	0 19	19 31 42.53	23 49 50.4	6.2	2.3	0.17	23	23 45	21 58 54.62	8 30 9.3	13.9	5.3
10	0 22	19 38 52.17	23 35 33.8	6.2	2.4	0.17	24	23 37	21 55 15.03	8 56 59.3	13.9	5.3
11	0 26	19 46 1.79	−23 19 43.1	6.3	2.4	0.17	25	23 30	21 51 53.99	− 9 23 43.2	13.8	5.2
12	0 29	19 53 11.21	23 2 17.9	6.3	2.4	0.17	26	23 23	21 48 54.80	9 49 51.9	13.7	5.2
13	0 32	20 0 20.22	22 43 17.9	6.3	2.4	0.17	27	23 17	21 46 19.89	10 15 0.8	13.6	5.1
14	0 35	20 7 28.59	22 22 43.0	6.4	2.4	0.17	28	23 11	21 44 10.91	10 38 50.0	13.4	5.1
15	0 38	20 14 36.07	22 0 33.2	6.4	2.4	0.17	Mar. 1	23 5	21 42 28.79	11 1 3.7	13.2	5.0
16	0 41	20 21 42.37	−21 36 48.6	6.5	2.4	0.18	2	23 0	21 41 13.90	−11 21 30.2	13.0	4.9
17	0 44	20 28 47.18	21 11 29.8	6.5	2.5	0.18	3	22 55	21 40 26.09	11 40 0.9	12.7	4.8
18	0 48	20 35 50.17	20 44 37.5	6.6	2.5	0.18	4	22 51	21 40 4.78	11 56 30.2	12.5	4.7
19	0 50	20 42 50.94	20 16 12.8	6.6	2.5	0.18	5	22 47	21 40 9.12	12 10 55.0	12.3	4.7
20	0 54	20 49 49.07	19 46 17.4	6.7	2.5	0.18	6	22 44	21 40 38.05	12 23 13.6	12.1	4.6
21	0 57	20 56 44.06	−19 14 53.2	6.8	2.6	0.18	7	22 41	21 41 30.37	−12 33 25.8	11.9	4.5
22	1 0	21 3 35.35	18 42 2.8	6.9	2.6	0.18	8	22 38	21 42 44.77	12 41 32.6	11.7	4.4
23	1 2	21 10 22.28	18 7 49.5	6.9	2.6	0.18	9	22 35	21 44 19.92	12 47 35.6	11.5	4.4
24	1 5	21 17 4.13	17 32 17.4	7.0	2.7	0.19	10	22 33	21 46 14.48	12 51 36.8	11.3	4.3
25	1 8	21 23 40.08	16 55 31.4	7.1	2.7	0.19	11	22 32	21 48 27.16	12 53 38.7	11.1	4.2
26	1 10	21 30 9.17	−16 17 37.6	7.2	2.8	0.19	12	22 30	21 50 56.70	−12 53 44.0	10.9	4.1
27	1 13	21 36 30.30	15 38 43.2	7.4	2.8	0.19	13	22 29	21 53 41.88	12 51 55.4	10.7	4.0
28	1 15	21 42 42.23	14 58 56.9	7.5	2.9	0.20	14	22 28	21 56 41.57	12 48 15.5	10.5	4.0
29	1 17	21 48 43.57	14 18 28.9	7.6	2.9	0.20	15	22 27	21 59 54.72	12 42 47.1	10.3	3.9
30	1 19	21 54 32.76	13 37 31.0	7.8	3.0	0.20	16	22 27	22 3 20.35	12 35 32.9	10.1	3.8
31	1 21	22 0 8.05	−12 56 16.8	8.0	3.0	0.21	17	22 26	22 6 57.54	−12 26 35.5	10.0	3.8
Feb. 1	1 22	22 5 27.51	12 15 2.0	8.2	3.1	0.21	18	22 26	22 10 45.43	12 15 57.3	9.8	3.7
2	1 23	22 10 29.03	11 34 4.3	8.4	3.2	0.22	19	22 26	22 14 43.26	12 3 40.7	9.6	3.6
3	1 24	22 15 10.33	10 53 43.4	8.6	3.3	0.22	20	22 27	22 18 50.33	11 49 47.9	9.5	3.6
4	1 24	22 19 29.02	10 14 20.8	8.8	3.4	0.23	21	22 27	22 23 6.00	11 34 21.0	9.3	3.5
5	1 24	22 23 22.61	− 9 36 19.7	9.1	3.5	0.24	22	22 27	22 27 29.69	−11 17 22.1	9.2	3.5
6	1 24	22 26 48.57	9 0 4.8	9.4	3.6	0.24	23	22 28	22 32 0.86	10 58 53.1	9.1	3.4
7	1 23	22 29 44.41	8 26 2.0	9.7	3.7	0.25	24	22 29	22 36 39.04	10 38 55.8	8.9	3.4
8	1 21	22 32 7.75	7 54 37.3	10.0	3.8	0.25	25	22 29	22 41 23.83	10 17 32.0	8.8	3.3
9	1 19	22 33 56.44	7 26 16.6	10.3	3.9	0.26	26	22 30	22 46 14.83	9 54 43.5	8.7	3.3
10	1 16	22 35 8.70	− 7 1 25.0	10.6	4.0	0.27	27	22 31	22 51 11.72	− 9 30 31.8	8.6	3.3
11	1 13	22 35 43.21	6 40 25.7	10.9	4.1	0.28	28	22 32	22 56 14.21	9 4 58.3	8.5	3.2
12	1 9	22 35 39.23	6 23 39.1	11.3	4.3	0.29	29	22 34	23 1 22.06	8 38 4.6	8.4	3.2
13	1 4	22 34 56.75	6 11 21.5	11.6	4.4	0.30	30	22 35	23 6 35.05	8 9 52.2	8.2	3.1
14	0 59	22 33 36.60	6 3 44.4	12.0	4.5	0.31	31	22 36	23 11 53.00	7 40 22.5	8.1	3.1
15	0 53	22 31 40.52	− 6 0 53.5	12.3	4.7	0.31	Apr. 1	22 38	23 17 15.76	− 7 9 36.6	8.0	3.0
16	0 47	22 29 11.19	− 6 2 47.9	12.6	4.8	0.32	2	22 39	23 22 43.23	− 6 37 35.9	7.9	3.0

FOR TRANSIT AT WASHINGTON.

ate.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
r. 1	22 38	23 17 15.76	− 7 9 36.6	8.0	3.0	0.21	May 17	1 8	4 45 12.50	+24 28 12.8	7.9	3.0	0.22
2	22 39	23 22 43.23	6 37 35.9	7.9	3.0	0.20	18	1 11	4 52 48.26	24 44 50.5	8.1	3.1	0.22
3	22 41	23 28 15.31	6 4 21.9	7.9	3.0	0.20	19	1 15	5 0 12.56	24 59 1.9	8.2	3.1	0.23
4	22 42	23 33 51.96	5 29 55.7	7.8	2.9	0.20	20	1 18	5 7 24.72	25 10 51.2	8.4	3.2	0.23
5	22 44	23 39 33.13	4 54 18.6	7.7	2.9	0.20	21	1 21	5 14 24.11	25 20 23.4	8.5	3.2	0.24
6	22 46	23 45 18.81	− 4 17 32.1	7.6	2.9	0.19	22	1 24	5 21 10.18	+25 27 44.0	8.7	3.3	0.24
7	22 48	23 51 9.02	3 39 37.4	7.5	2.9	0.19	23	1 27	5 27 42.42	25 32 58.8	8.9	3.4	0.25
8	22 50	23 57 3.82	3 0 36.0	7.4	2.8	0.19	24	1 29	5 34 0.34	25 36 13.8	9.1	3.4	0.25
9	22 52	0 3 3.27	2 20 29.2	7.4	2.8	0.19	25	1 31	5 40 3.49	25 37 35.1	9.3	3.5	0.26
10	22 54	0 9 7.46	1 39 18.4	7.3	2.8	0.19	26	1 33	5 45 51.47	25 37 8.8	9.5	3.6	0.27
11	22 56	0 15 16.49	− 0 57 5.2	7.2	2.8	0.18	27	1 34	5 51 23.89	+25 35 1.1	9.7	3.7	0.27
12	22 58	0 21 30.51	− 0 13 51.2	7.2	2.7	0.18	28	1 36	5 56 40.35	25 31 17.9	9.9	3.8	0.28
13	23 1	0 27 49.66	+ 0 30 21.8	7.1	2.7	0.18	29	1 37	6 1 40.48	25 26 5.4	10.2	3.9	0.28
14	23 3	0 34 14.10	1 15 31.8	7.1	2.7	0.18	30	1 38	6 6 23.91	25 19 29.8	10.4	4.0	0.29
15	23 6	0 40 44.03	2 1 36.7	7.0	2.7	0.18	31	1 38	6 10 50.30	25 11 36.9	10.6	4.0	0.30
16	23 8	0 47 19.63	+ 2 48 34.3	6.9	2.6	0.18	June 1	1 38	6 14 59.29	+25 2 32.4	10.9	4.1	0.30
17	23 11	0 54 1.12	3 36 22.0	6.9	2.6	0.18	2	1 38	6 18 50.52	24 52 22.1	11.1	4.2	0.31
18	23 14	1 0 48.72	4 24 56.9	6.9	2.6	0.17	3	1 38	6 22 23.64	24 41 11.8	11.4	4.3	0.32
19	23 17	1 7 42.65	5 14 15.8	6.8	2.6	0.17	4	1 37	6 25 38.32	24 29 7.0	11.7	4.4	0.32
20	23 20	1 14 43.12	6 4 14.9	6.8	2.6	0.17	5	1 36	6 28 34.24	24 16 13.0	11.9	4.5	0.33
21	23 23	1 21 50.35	+ 6 54 50.1	6.7	2.6	0.17	6	1 35	6 31 11.09	+24 2 35.3	12.2	4.6	0.34
22	23 26	1 29 4.53	7 45 56.5	6.7	2.5	0.17	7	1 33	6 33 28.57	23 48 19.1	12.4	4.7	0.34
23	23 30	1 36 25.83	8 37 28.9	6.7	2.5	0.17	8	1 31	6 35 26.43	23 33 29.8	12.7	4.8	0.35
24	23 33	1 43 54.39	9 29 21.2	6.7	2.5	0.17	9	1 29	6 37 4.49	23 18 12.7	13.0	4.9	0.36
25	23 37	1 51 30.28	10 21 26.5	6.6	2.5	0.17	10	1 26	6 38 22.60	23 2 33.0	13.3	5.0	0.36
26	23 41	1 59 13.54	+11 13 37.3	6.6	2.5	0.17	11	1 23	6 39 20.67	+22 46 35.7	13.5	5.1	0.37
27	23 45	2 7 4.14	12 5 45.0	6.6	2.5	0.17	12	1 20	6 39 58.74	22 30 26.0	13.8	5.2	0.38
28	23 49	2 15 1.93	12 57 40.1	6.6	2.5	0.17	13	1 16	6 40 16.92	22 14 9.3	14.0	5.3	0.38
29	23 53	2 23 6.65	13 49 12.4	6.6	2.5	0.17	14	1 12	6 40 15.46	21 57 50.7	14.3	5.4	0.39
30	23 57	2 31 17.96	14 40 10.9	6.6	2.5	0.17	15	1 8	6 39 54.79	21 41 35.6	14.5	5.5	0.40
ay 2	0 1	2 39 35.38	+15 30 23.8	6.6	2.5	0.18	16	1 4	6 39 15.47	+21 25 29.3	14.7	5.6	0.40
3	0 6	2 47 58.29	16 19 38.8	6.7	2.5	0.18	17	0 59	6 38 18.26	21 9 37.1	14.9	5.7	0.41
4	0 10	2 56 25.93	17 7 43.4	6.7	2.5	0.18	18	0 54	6 37 4.09	20 54 4.6	15.1	5.7	0.41
5	0 15	3 4 57.42	17 54 24.8	6.7	2.6	0.18	19	0 48	6 35 34.13	20 38 57.6	15.3	5.8	0.41
6	0 20	3 13 31.75	18 39 30.5	6.8	2.6	0.18	20	0 42	6 33 49.77	20 24 21.6	15.5	5.9	0.42
7	0 24	3 22 7.81	+19 22 48.8	6.9	2.6	0.18	21	0 36	6 31 52.62	+20 10 22.3	15.6	5.9	0.42
8	0 29	3 30 44.40	20 4 8.6	6.9	2.6	0.19	22	0 30	6 29 44.47	19 57 5.6	15.7	5.9	0.42
9	0 33	3 39 20.26	20 43 19.9	7.0	2.7	0.19	23	0 24	6 27 27.32	19 44 37.3	15.7	6.0	0.42
10	0 38	3 47 54.12	21 20 14.4	7.1	2.7	0.19	24	0 18	6 25 3.36	19 33 3.0	15.8	6.0	0.42
11	0 43	3 56 24.69	21 54 44.9	7.2	2.7	0.20	25	0 12	6 22 34.89	19 22 28.2	15.8	6.0	0.42
12	0 47	4 4 50.71	+22 26 45.9	7.3	2.8	0.20	26	0 5	6 20 4.33	+19 12 58.0	15.8	6.0	0.42
13	0 52	4 13 10.97	22 56 13.8	7.4	2.8	0.20	26	23 59	6 17 34.15	19 4 37.2	15.7	6.0	0.42
14	0 56	4 21 24.31	23 23 6.4	7.5	2.8	0.21	27	23 52	6 15 6.84	18 57 30.1	15.6	5.9	0.42
15	1 0	4 29 29.66	23 47 23.2	7.6	2.9	0.21	28	23 46	6 12 44.83	18 51 40.4	15.5	5.9	0.41
16	1 4	4 37 26.03	24 9 4.7	7.7	2.9	0.21	29	23 40	6 10 30.47	18 47 11.1	15.3	5.8	0.41
17	1 8	4 45 12.50	+24 28 12.8	7.9	3.0	0.22	30	23 34	6 8 25.99	+18 44 4.2	15.1	5.8	0.40
18	1 11	4 52 48.26	+24 44 50.5	8.1	3.1	0.22	July 1	23 28	6 6 33.47	+18 42 21.1	14.9	5.7	0.40

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	23 28	6 6 33.47	+18 42 21.1	14.9	5.7	0.40	Aug. 16	0 16	9 52 11.79	+14 47 34.7	6.5	2.5	0.1
2	23 22	6 4 54.81	18 42 2.3	14.7	5.6	0.39	17	0 20	9 59 51.34	14 5 57.2	6.5	2.5	0.1
3	23 17	6 3 31.74	18 43 7.1	14.5	5.5	0.39	18	0 23	10 7 22.65	13 23 25.2	6.5	2.5	0.1
4	23 12	6 2 25.76	18 45 33.9	14.2	5.4	0.38	19	0 27	10 14 45.74	12 40 6.3	6.5	2.5	0.1
5	23 7	6 1 38.15	18 49 20.4	13.9	5.3	0.37	20	0 30	10 22 0.68	11 56 7.5	6.5	2.5	0.1
6	23 3	6 1 10.02	+18 54 23.2	13.7	5.2	0.37	21	0 33	10 29 7.59	+11 11 35.4	6.5	2.5	0.1
7	22 59	6 1 2.31	19 0 38.2	13.4	5.1	0.36	22	0 36	10 36 6.63	10 26 36.1	6.5	2.5	0.1
8	22 55	6 1 15.74	19 8 0.5	13.0	5.0	0.35	23	0 39	10 42 58.01	9 41 14.9	6.5	2.5	0.1
9	22 52	6 1 50.90	19 16 24.3	12.7	4.9	0.34	24	0 42	10 49 41.96	8 55 37.1	6.5	2.5	0.1
10	22 49	6 2 48.27	19 25 43.3	12.4	4.7	0.33	25	0 45	10 56 18.73	8 9 47.3	6.5	2.5	0.1
11	22 46	6 4 8.19	+19 35 50.6	12.1	4.6	0.33	26	0 47	11 2 48.56	+ 7 23 49.8	6.5	2.5	0.1
12	22 44	6 5 50.87	19 46 38.6	11.8	4.5	0.32	27	0 50	11 9 11.69	6 37 48.4	6.6	2.5	0.1
13	22 42	6 7 56.47	19 57 59.3	11.5	4.4	0.31	28	0 52	11 15 28.39	5 51 46.7	6.6	2.5	0.1
14	22 41	6 10 25.09	20 9 44.2	11.2	4.3	0.30	29	0 54	11 21 38.90	5 5 48.0	6.6	2.5	0.1
15	22 40	6 13 16.71	20 21 44.3	10.9	4.2	0.30	30	0 56	11 27 43.46	4 19 55.4	6.7	2.5	0.1
16	22 39	6 16 31.31	+20 33 50.1	10.6	4.0	0.29	31	0 58	11 33 42.31	+ 3 34 11.8	6.7	2.5	0.1
17	22 39	6 20 8.78	20 45 51.5	10.4	3.9	0.28	Sept. 1	1 0	11 39 35.66	2 48 39.7	6.7	2.6	0.1
18	22 39	6 24 9.01	20 57 38.4	10.1	3.8	0.27	2	1 2	11 45 23.73	2 3 21.7	6.8	2.6	0.1
19	22 39	6 28 31.81	21 8 59.9	9.8	3.7	0.27	3	1 4	11 51 6.71	1 18 20.1	6.8	2.6	0.1
20	22 40	6 33 16.89	21 19 44.9	9.5	3.6	0.26	4	1 6	11 56 44.78	+ 0 33 37.1	6.9	2.6	0.1
21	22 41	6 38 23.93	+21 29 42.1	9.3	3.5	0.25	5	1 7	12 2 18.11	− 0 10 45.1	6.9	2.6	0.1
22	22 43	6 43 52.56	21 38 39.6	9.1	3.4	0.25	6	1 9	12 7 46.84	0 54 44.5	7.0	2.6	0.1
23	22 45	6 49 42.27	21 46 25.4	8.8	3.4	0.24	7	1 10	12 13 11.11	1 38 19.2	7.0	2.7	0.1
24	22 47	6 55 52.42	21 52 47.7	8.6	3.3	0.24	8	1 12	12 18 31.02	2 21 27.3	7.1	2.7	0.1
25	22 49	7 2 22.26	21 57 34.5	8.4	3.2	0.23	9	1 13	12 23 46.68	3 4 7.0	7.1	2.7	0.1
26	22 52	7 9 10.91	+22 0 34.0	8.2	3.1	0.23	10	1 14	12 28 58.15	− 3 46 16.3	7.2	2.7	0.1
27	22 55	7 16 17.32	22 1 35.2	8.1	3.1	0.22	11	1 15	12 34 5.47	4 27 53.4	7.3	2.8	0.1
28	22 59	7 23 40.25	22 0 27.6	7.9	3.0	0.22	12	1 16	12 39 8.68	5 8 56.3	7.3	2.8	0.1
29	23 2	7 31 18.33	21 57 1.8	7.7	2.9	0.21	13	1 17	12 44 7.78	5 49 23.3	7.4	2.8	0.1
30	23 6	7 39 10.00	21 51 9.7	7.6	2.9	0.21	14	1 18	12 49 2.75	6 29 12.3	7.5	2.8	0.1
31	23 10	7 47 13.56	+21 42 44.8	7.4	2.8	0.20	15	1 19	12 53 53.55	− 7 8 21.3	7.6	2.9	0.1
Aug. 1	23 15	7 55 27.19	21 31 42.4	7.3	2.8	0.20	16	1 20	12 58 40.08	7 46 48.4	7.7	2.9	0.1
2	23 19	8 3 49.00	21 17 59.6	7.2	2.7	0.20	17	1 21	13 3 22.24	8 24 31.4	7.7	2.9	0.2
3	23 24	8 12 17.06	21 1 35.7	7.1	2.7	0.19	18	1 22	13 7 59.88	9 1 28.0	7.8	3.0	0.2
4	23 28	8 20 49.42	20 42 32.0	7.0	2.7	0.19	19	1 22	13 12 32.82	9 37 35.8	7.9	3.0	0.2
5	23 33	8 29 24.20	+20 20 51.6	6.9	2.6	0.19	20	1 23	13 17 0.83	−10 12 52.2	8.0	3.0	0.2
6	23 37	8 37 59.63	19 56 39.5	6.8	2.6	0.18	21	1 23	13 21 23.65	10 47 14.5	8.1	3.1	0.2
7	23 42	8 46 34.05	19 30 2.2	6.8	2.6	0.18	22	1 23	13 25 40.97	11 20 39.9	8.2	3.1	0.2
8	23 47	8 55 5.96	19 1 7.4	6.7	2.5	0.18	23	1 24	13 29 52.42	11 53 5.3	8.3	3.2	0.2
9	23 51	9 3 34.05	18 30 3.8	6.6	2.5	0.18	24	1 24	13 33 57.57	12 24 27.1	8.5	3.2	0.2
10	23 56	9 11 57.20	+17 57 0.7	6.6	2.5	0.18	25	1 24	13 37 55.92	−12 54 41.7	8.6	3.3	0.2
12	0 0	9 20 14.45	17 22 7.9	6.6	2.5	0.17	26	1 24	13 41 46.92	13 23 44.9	8.8	3.3	0.2
13	0 4	9 28 25.05	16 45 35.3	6.5	2.5	0.17	27	1 24	13 45 29.93	13 51 32.4	8.9	3.4	0.2
14	0 8	9 36 28.40	16 7 32.7	6.5	2.5	0.17	28	1 23	13 49 4.21	14 17 59.1	9.0	3.4	0.2
15	0 12	9 44 24.08	15 28 9.5	6.5	2.5	0.17	29	1 23	13 52 28.94	14 42 59.5	9.2	3.5	0.2
16	0 16	9 52 11.79	+14 47 34.7	6.5	2.5	0.17	30	1 22	13 55 43.20	−15 6 27.6	9.4	3.6	0.2
17	0 20	9 59 51.34	+14 5 57.2	6.5	2.5	0.17	Oct. 1	1 21	13 58 46.00	−15 28 16.8	9.6	3.6	0.2

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Oct. 1	1 21	13 58 46.00	−15 28 16.8	9.6	3.6	0.25
2	1 20	14 1 36.21	15 48 19.6	9.7	3.7	0.25
3	1 19	14 4 12.55	16 6 27.8	9.9	3.8	0.26
4	1 17	14 6 33.65	16 22 32.1	10.1	3.8	0.27
5	1 15	14 8 38.04	16 36 22.4	10.3	3.9	0.27
6	1 13	14 10 24.13	−16 47 47.7	10.5	4.0	0.28
7	1 11	14 11 50.21	16 56 35.6	10.7	4.1	0.28
8	1 8	14 12 54.53	17 2 32.7	10.9	4.1	0.29
9	1 4	14 13 35.31	17 5 24.6	11.2	4.2	0.30
10	1 1	14 13 50.76	17 4 56.2	11.4	4.3	0.30
11	0 57	14 13 39.23	−17 0 51.9	11.6	4.4	0.31
12	0 52	14 12 59.27	16 52 56.0	11.9	4.5	0.31
13	0 47	14 11 49.72	16 40 53.7	12.1	4.6	0.32
14	0 41	14 10 9.94	16 24 32.2	12.3	4.7	0.33
15	0 35	14 7 59.93	16 3 42.1	12.5	4.8	0.33
16	0 29	14 5 20.51	−15 38 19.3	12.7	4.8	0.34
17	0 22	14 2 13.52	15 8 26.9	12.9	4.9	0.34
18	0 14	13 58 41.95	14 34 17.5	13.0	5.0	0.34
19	0 6	13 54 49.99	13 56 14.6	13.1	5.0	0.34
19	23 58	13 50 43.05	13 14 54.2	13.2	5.0	0.34
20	23 50	13 46 27.59	−12 31 5.1	13.2	5.0	0.34
21	23 42	13 42 10.88	11 45 47.1	13.2	5.0	0.34
22	23 34	13 38 0.60	11 0 8.8	13.0	5.0	0.33
23	23 26	13 34 4.47	10 15 23.1	12.9	4.9	0.33
24	23 19	13 30 29.74	9 32 42.8	12.7	4.8	0.33
25	23 12	13 27 22.79	− 8 53 15.8	12.4	4.7	0.32
26	23 5	13 24 48.84	8 18 0.4	12.1	4.6	0.31
27	22 59	13 22 51.71	7 47 42.5	11.8	4.5	0.30
28	22 54	13 21 33.83	7 22 54.5	11.5	4.4	0.29
29	22 49	13 20 56.26	7 3 54.9	11.2	4.3	0.29
30	22 45	13 20 58.85	− 6 50 49.2	10.9	4.1	0.28
31	22 42	13 21 40.44	6 43 32.1	10.5	4.0	0.27
Nov. 1	22 40	13 22 59.10	6 41 49.4	10.2	3.9	0.26
2	22 38	13 24 52.35	6 45 20.3	9.9	3.8	0.25
3	22 36	13 27 17.41	6 53 40.0	9.6	3.7	0.24
4	22 35	13 30 11.33	− 7 6 20.9	9.3	3.5	0.24
5	22 34	13 33 31.13	7 22 54.5	9.1	3.4	0.23
6	22 34	13 37 13.93	7 42 52.4	8.8	3.3	0.22
7	22 34	13 41 17.03	8 5 47.3	8.6	3.2	0.22
8	22 35	13 45 37.93	8 31 13.3	8.4	3.2	0.21
9	22 35	13 50 14.39	− 8 58 46.6	8.2	3.1	0.21
10	22 36	13 55 4.38	9 28 5.4	8.0	3.0	0.20
11	22 37	14 0 6.13	9 58 49.8	7.8	3.0	0.20
12	22 39	14 5 18.09	10 30 42.1	7.7	2.9	0.20
13	22 40	14 10 38.93	11 3 26.5	7.6	2.9	0.19
14	22 41	14 16 7.49	−11 36 49.4	7.4	2.8	0.19
15	22 43	14 21 42.78	−12 10 38.2	7.3	2.8	0.19
Nov. 15	22 43	14 21 42.78	−12 10 38.2	7.3	2.8	0.19
16	22 45	14 27 23.99	12 44 42.0	7.2	2.7	0.19
17	22 47	14 33 10.44	13 18 51.4	7.1	2.7	0.18
18	22 49	14 39 1.53	13 52 58.0	7.0	2.6	0.18
19	22 51	14 44 56.76	14 26 54.3	6.9	2.6	0.18
20	22 53	14 50 55.73	−15 0 33.7	6.8	2.6	0.18
21	22 55	14 56 58.11	15 33 50.5	6.7	2.6	0.18
22	22 57	15 3 3.64	16 6 39.8	6.7	2.5	0.18
23	22 59	15 9 12.09	16 38 56.9	6.6	2.5	0.17
24	23 1	15 15 23.28	17 10 37.8	6.5	2.5	0.17
25	23 4	15 21 37.05	−17 41 38.7	6.5	2.5	0.17
26	23 6	15 27 53.30	18 11 56.5	6.4	2.4	0.17
27	23 8	15 34 11.93	18 41 28.3	6.4	2.4	0.17
28	23 11	15 40 32.88	19 10 11.1	6.4	2.4	0.17
29	23 13	15 46 56.09	19 38 2.7	6.3	2.4	0.17
30	23 16	15 53 21.52	−20 5 0.7	6.3	2.4	0.17
Dec. 1	23 18	15 59 49.12	20 31 2.8	6.3	2.4	0.17
2	23 21	16 6 18.86	20 56 7.1	6.2	2.4	0.17
3	23 23	16 12 50.74	21 20 11.6	6.2	2.4	0.17
4	23 26	16 19 24.72	21 43 14.6	6.2	2.3	0.17
5	23 28	16 26 0.78	−22 5 14.4	6.1	2.3	0.17
6	23 31	16 32 38.89	22 26 9.1	6.1	2.3	0.17
7	23 34	16 39 19.04	22 45 57.2	6.1	2.3	0.17
8	23 37	16 46 1.21	23 4 37.3	6.1	2.3	0.17
9	23 39	16 52 45.36	23 22 7.8	6.1	2.3	0.17
10	23 42	16 59 31.45	−23 38 27.0	6.1	2.3	0.17
11	23 45	17 6 19.46	23 53 33.5	6.1	2.3	0.17
12	23 48	17 13 9.34	24 7 26.0	6.1	2.3	0.17
13	23 51	17 20 1.06	24 20 3.1	6.1	2.3	0.17
14	23 54	17 26 54.55	24 31 23.4	6.1	2.3	0.17
15	23 57	17 33 49.74	−24 41 25.4	6.1	2.3	0.17
17	0 0	17 40 46.56	24 50 7.9	6.1	2.3	0.17
18	0 3	17 47 44.95	24 57 29.4	6.1	2.3	0.17
19	0 6	17 54 44.81	25 3 28.7	6.1	2.3	0.17
20	0 9	18 1 46.04	25 8 4.5	6.1	2.3	0.17
21	0 12	18 8 48.52	−25 11 15.4	6.1	2.3	0.17
22	0 15	18 15 52.13	25 13 0.3	6.1	2.3	0.17
23	0 18	18 22 56.74	25 13 18.0	6.2	2.3	0.17
24	0 21	18 30 2.20	25 12 7.3	6.2	2.4	0.17
25	0 25	18 37 8.34	25 9 27.1	6.2	2.4	0.17
26	0 28	18 44 14.97	−25 5 16.4	6.3	2.4	0.17
27	0 31	18 51 21.90	24 59 34.3	6.3	2.4	0.18
28	0 34	18 58 28.90	24 52 19.9	6.3	2.4	0.18
29	0 37	19 5 35.73	24 43 32.3	6.4	2.4	0.18
30	0 40	19 12 42.11	24 33 10.9	6.4	2.4	0.18
31	0 44	19 19 47.76	−24 21 15.3	6.5	2.5	0.18
32	0 47	19 26 52.34	−24 7 45.3	6.5	2.5	0.18

VENUS, 1915.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Jan. 0	21 18	15 58 8.65	−16 8 47.5	21.7	21.1	1.46	Feb. 15	21 2	18 43 53.43	−20 12 58.6	11.8	11.4	0.81
1	21 16	16 0 14.41	16 12 5.3	21.4	20.7	1.44	16	21 2	18 48 26.35	20 12 20.9	11.7	11.3	0.80
2	21 14	16 2 26.33	16 15 55.5	21.0	20.4	1.42	17	21 3	18 53 0.35	20 11 14.2	11.5	11.2	0.80
3	21 12	16 4 44.20	16 20 15.8	20.7	20.1	1.40	18	21 4	18 57 35.37	20 9 38.3	11.4	11.1	0.79
4	21 11	16 7 7.83	16 25 3.9	20.3	19.7	1.38	19	21 4	19 2 11.33	20 7 32.8	11.3	11.0	0.78
5	21 9	16 9 37.04	−16 30 17.5	20.0	19.4	1.36	20	21 5	19 6 48.16	−20 4 57.3	11.2	10.9	0.77
6	21 8	16 12 11.66	16 35 54.3	19.7	19.1	1.33	21	21 6	19 11 25.82	20 1 51.6	11.1	10.8	0.77
7	21 7	16 14 51.50	16 41 52.2	19.4	18.9	1.31	22	21 6	19 16 4.23	19 58 15.3	11.0	10.7	0.76
8	21 6	16 17 36.39	16 48 9.0	19.1	18.6	1.30	23	21 7	19 20 43.32	19 54 8.2	10.9	10.6	0.75
9	21 4	16 20 26.15	16 54 42.6	18.8	18.3	1.28	24	21 8	19 25 23.05	19 49 30.1	10.8	10.5	0.74
10	21 3	16 23 20.62	−17 1 31.1	18.5	18.0	1.26	25	21 9	19 30 3.34	−19 44 20.8	10.7	10.4	0.74
11	21 2	16 26 19.65	17 8 32.3	18.2	17.7	1.24	26	21 9	19 34 44.15	19 38 40.2	10.6	10.3	0.73
12	21 1	16 29 23.07	17 15 44.3	18.0	17.5	1.22	27	21 10	19 39 25.41	19 32 28.2	10.5	10.2	0.72
13	21 1	16 32 30.75	17 23 5.3	17.7	17.2	1.20	28	21 11	19 44 7.08	19 25 44.7	10.4	10.1	0.72
14	21 0	16 35 42.53	17 30 33.4	17.4	16.9	1.19	Mar. 1	21 12	19 48 49.10	19 18 29.6	10.3	10.0	0.71
15	20 59	16 38 58.27	−17 38 7.1	17.2	16.7	1.17	2	21 12	19 53 31.41	−19 10 42.9	10.2	9.9	0.70
16	20 59	16 42 17.85	17 45 44.6	17.0	16.5	1.15	3	21 13	19 58 13.96	19 2 24.6	10.1	9.8	0.69
17	20 58	16 45 41.15	17 53 24.2	16.7	16.2	1.14	4	21 14	20 2 56.71	18 53 34.7	10.0	9.7	0.69
18	20 58	16 49 8.06	18 1 4.3	16.5	16.0	1.12	5	21 15	20 7 39.60	18 44 13.3	9.9	9.6	0.68
19	20 57	16 52 38.46	18 8 43.5	16.3	15.8	1.11	6	21 15	20 12 22.56	18 34 20.6	9.9	9.6	0.67
20	20 57	16 56 12.25	−18 16 20.2	16.0	15.6	1.09	7	21 16	20 17 5.55	−18 23 56.7	9.8	9.5	0.67
21	20 56	16 59 49.33	18 23 52.9	15.8	15.4	1.08	8	21 17	20 21 48.53	18 13 1.7	9.7	9.4	0.66
22	20 56	17 3 29.60	18 31 20.2	15.6	15.1	1.07	9	21 18	20 26 31.44	18 1 35.8	9.6	9.3	0.65
23	20 56	17 7 12.97	18 38 40.8	15.4	14.9	1.05	10	21 18	20 31 14.24	17 49 39.3	9.5	9.3	0.65
24	20 56	17 10 59.34	18 45 53.3	15.2	14.7	1.04	11	21 19	20 35 56.88	17 37 12.5	9.5	9.2	0.64
25	20 56	17 14 48.64	−18 52 56.5	15.0	14.6	1.03	12	21 20	20 40 39.32	−17 24 15.7	9.4	9.1	0.64
26	20 56	17 18 40.77	18 59 49.1	14.8	14.4	1.02	13	21 21	20 45 21.51	17 10 49.2	9.3	9.1	0.63
27	20 56	17 22 35.65	19 6 29.8	14.6	14.2	1.00	14	21 22	20 50 3.42	16 56 53.3	9.2	9.0	0.63
28	20 56	17 26 33.19	19 12 57.4	14.4	14.0	0.99	15	21 22	20 54 45.02	16 42 28.4	9.2	8.9	0.62
29	20 56	17 30 33.33	19 19 10.8	14.3	13.8	0.98	16	21 23	20 59 26.27	16 27 34.8	9.1	8.8	0.62
30	20 56	17 34 35.97	−19 25 8.9	14.1	13.7	0.97	17	21 24	21 4 7.15	−16 12 12.9	9.0	8.8	0.61
31	20 56	17 38 41.03	19 30 50.6	13.9	13.5	0.96	18	21 24	21 8 47.63	15 56 23.2	9.0	8.7	0.60
Feb. 1	20 56	17 42 48.45	19 36 14.8	13.8	13.3	0.94	19	21 25	21 13 27.67	15 40 6.1	8.9	8.7	0.60
2	20 56	17 46 58.14	19 41 20.4	13.6	13.2	0.93	20	21 26	21 18 7.27	15 23 22.0	8.8	8.6	0.59
3	20 57	17 51 10.01	19 46 6.5	13.4	13.0	0.92	21	21 27	21 22 46.40	15 6 11.4	8.8	8.5	0.59
4	20 57	17 55 23.99	−19 50 32.2	13.3	12.9	0.91	22	21 27	21 27 25.05	−14 48 34.6	8.7	8.5	0.58
5	20 57	17 59 40.00	19 54 36.6	13.1	12.7	0.90	23	21 28	21 32 3.20	14 30 32.2	8.7	8.4	0.58
6	20 57	18 3 57.96	19 58 18.7	13.0	12.6	0.89	24	21 29	21 36 40.84	14 12 4.6	8.6	8.3	0.57
7	20 58	18 8 17.78	20 1 37.8	12.8	12.5	0.89	25	21 29	21 41 17.97	13 53 12.3	8.5	8.3	0.57
8	20 58	18 12 39.37	20 4 33.2	12.7	12.3	0.88	26	21 30	21 45 54.57	13 33 55.7	8.5	8.2	0.56
9	20 59	18 17 2.65	−20 7 4.1	12.6	12.2	0.87	27	21 31	21 50 30.64	−13 14 15.5	8.4	8.2	0.56
10	20 59	18 21 27.55	20 9 9.7	12.4	12.1	0.86	28	21 31	21 55 6.18	12 54 12.1	8.4	8.1	0.55
11	21 0	18 25 53.98	20 10 49.4	12.3	11.9	0.85	29	21 32	21 59 41.19	12 33 46.0	8.3	8.1	0.55
12	21 0	18 30 21.87	20 12 2.7	12.2	11.8	0.84	30	21 33	22 4 15.67	12 12 57.7	8.2	8.0	0.54
13	21 1	18 34 51.13	20 12 49.0	12.0	11.7	0.83	31	21 33	22 8 49.62	11 51 47.8	8.2	7.9	0.54
14	21 1	18 39 21.67	−20 13 7.8	11.9	11.6	0.82	Apr. 1	21 34	22 13 23.05	−11 30 16.8	8.1	7.9	0.54
15	21 2	18 43 53.43	−20 12 58.6	11.8	11.4	0.81	2	21 35	22 17 55.97	−11 8 25.3	8.1	7.8	0.53

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Apr. 1	21 34	22 13 23.05	−11 30 16.8	8.1	7.9	0.54
2	21 35	22 17 55.97	11 8 25.3	8.1	7.8	0.53
3	21 35	22 22 28.37	10 46 13.9	8.0	7.8	0.53
4	21 36	22 27 0.27	10 23 43.1	8.0	7.7	0.52
5	21 36	22 31 31.66	10 0 53.5	7.9	7.7	0.52
6	21 37	22 36 2.56	− 9 37 45.8	7.9	7.6	0.52
7	21 37	22 40 32.98	9 14 20.7	7.8	7.6	0.51
8	21 38	22 45 2.92	8 50 38.7	7.8	7.5	0.51
9	21 39	22 49 32.40	8 26 40.5	7.7	7.5	0.50
10	21 39	22 54 1.42	8 2 26.7	7.7	7.5	0.50
11	21 40	22 58 30.00	− 7 37 57.9	7.6	7.4	0.50
12	21 40	23 2 58.15	7 13 14.8	7.6	7.4	0.49
13	21 41	23 7 25.90	6 48 18.1	7.5	7.3	0.49
14	21 41	23 11 53.26	6 23 8.5	7.5	7.3	0.49
15	21 42	23 16 20.26	5 57 46.4	7.5	7.3	0.49
16	21 42	23 20 46.91	− 5 32 12.6	7.4	7.2	0.48
17	21 43	23 25 13.23	5 6 27.8	7.4	7.2	0.48
18	21 43	23 29 39.25	4 40 32.5	7.4	7.1	0.48
19	21 44	23 34 4.99	4 14 27.4	7.3	7.1	0.48
20	21 44	23 38 30.48	3 48 13.1	7.3	7.1	0.47
21	21 45	23 42 55.74	− 3 21 50.3	7.2	7.0	0.47
22	21 45	23 47 20.80	2 55 19.7	7.2	7.0	0.47
23	21 45	23 51 45.70	2 28 41.8	7.1	6.9	0.46
24	21 46	23 56 10.46	2 1 57.2	7.1	6.9	0.46
25	21 46	0 0 35.12	1 35 6.6	7.1	6.9	0.46
26	21 47	0 4 59.72	− 1 8 10.5	7.0	6.8	0.46
27	21 47	0 9 24.28	0 41 9.6	7.0	6.8	0.45
28	21 48	0 13 48.83	− 0 14 4.6	7.0	6.8	0.45
29	21 48	0 18 13.42	+ 0 13 4.0	6.9	6.7	0.45
30	21 49	0 22 38.08	0 40 15.4	6.9	6.7	0.45
May 1	21 49	0 27 2.84	+ 1 7 29.0	6.9	6.7	0.44
2	21 50	0 31 27.72	1 34 44.2	6.8	6.6	0.44
3	21 50	0 35 52.77	2 2 0.4	6.8	6.6	0.44
4	21 51	0 40 18.03	2 29 16.9	6.8	6.6	0.44
5	21 51	0 44 43.52	2 56 32.9	6.7	6.5	0.44
6	21 52	0 49 9.27	+ 3 23 47.8	6.7	6.5	0.43
7	21 52	0 53 35.31	3 51 1.0	6.7	6.5	0.43
8	21 53	0 58 1.68	4 18 11.8	6.6	6.4	0.43
9	21 53	1 2 28.40	4 45 19.4	6.6	6.4	0.43
10	21 54	1 6 55.50	5 12 23.1	6.6	6.4	0.43
11	21 54	1 11 23.02	+ 5 39 22.2	6.5	6.4	0.43
12	21 55	1 15 50.99	6 6 16.2	6.5	6.3	0.43
13	21 55	1 20 19.44	6 33 4.3	6.5	6.3	0.42
14	21 56	1 24 48.41	6 59 45.8	6.5	6.3	0.42
15	21 56	1 29 17.91	7 26 20.0	6.4	6.3	0.42
16	21 57	1 33 47.98	+ 7 52 46.3	6.4	6.2	0.42
17	21 57	1 38 18.66	+ 8 19 4.0	6.4	6.2	0.42
May 16	21 57	1 33 47.98	+ 7 52 46.3	6.4	6.2	0.42
17	21 57	1 38 18.66	8 19 4.0	6.4	6.2	0.42
18	21 58	1 42 49.97	8 45 12.4	6.4	6.2	0.42
19	21 59	1 47 21.94	9 11 10.7	6.3	6.2	0.42
20	21 59	1 51 54.61	9 36 58.4	6.3	6.1	0.41
21	22 0	1 56 28.01	+10 2 34.8	6.3	6.1	0.41
22	22 0	2 1 2.16	10 27 59.1	6.3	6.1	0.41
23	22 1	2 5 37.09	10 53 10.7	6.2	6.1	0.41
24	22 2	2 10 12.82	11 18 8.9	6.2	6.0	0.41
25	22 2	2 14 49.40	11 42 53.1	6.2	6.0	0.41
26	22 3	2 19 26.85	+12 7 22.5	6.2	6.0	0.41
27	22 4	2 24 5.21	12 31 36.5	6.1	6.0	0.41
28	22 4	2 28 44.50	12 55 34.4	6.1	5.9	0.41
29	22 5	2 33 24.74	13 19 15.4	6.1	5.9	0.40
30	22 6	2 38 5.96	13 42 38.9	6.1	5.9	0.40
31	22 7	2 42 48.18	+14 5 44.2	6.0	5.9	0.40
June 1	22 7	2 47 31.42	14 28 30.7	6.0	5.8	0.40
2	22 8	2 52 15.70	14 50 57.5	6.0	5.8	0.40
3	22 9	2 57 1.03	15 13 3.9	6.0	5.8	0.40
4	22 10	3 1 47.43	15 34 49.2	6.0	5.8	0.40
5	22 11	3 6 34.92	+15 56 12.8	5.9	5.8	0.40
6	22 12	3 11 23.50	16 17 14.0	5.9	5.8	0.40
7	22 12	3 16 13.18	16 37 51.9	5.9	5.7	0.40
8	22 13	3 21 3.97	16 58 5.7	5.9	5.7	0.40
9	22 14	3 25 55.87	17 17 55.0	5.9	5.7	0.40
10	22 15	3 30 48.89	+17 37 19.0	5.8	5.7	0.40
11	22 16	3 35 43.03	17 56 17.0	5.8	5.7	0.40
12	22 17	3 40 38.28	18 14 48.3	5.8	5.6	0.40
13	22 18	3 45 34.64	18 32 52.2	5.8	5.6	0.40
14	22 19	3 50 32.12	18 50 28.0	5.8	5.6	0.39
15	22 20	3 55 30.70	+19 7 35.2	5.8	5.6	0.39
16	22 21	4 0 30.38	19 24 13.0	5.7	5.6	0.39
17	22 22	4 5 31.15	19 40 20.8	5.7	5.6	0.39
18	22 23	4 10 32.99	19 55 58.0	5.7	5.5	0.39
19	22 25	4 15 35.88	20 11 3.9	5.7	5.5	0.39
20	22 26	4 20 39.82	+20 25 38.0	5.7	5.5	0.39
21	22 27	4 25 44.80	20 39 39.7	5.7	5.5	0.39
22	22 28	4 30 50.79	20 53 8.4	5.6	5.5	0.39
23	22 29	4 35 57.76	21 6 3.6	5.6	5.5	0.39
24	22 30	4 41 5.70	21 18 24.6	5.6	5.5	0.39
25	22 32	4 46 14.59	+21 30 11.0	5.6	5.4	0.39
26	22 33	4 51 24.40	21 41 22.2	5.6	5.4	0.39
27	22 34	4 56 35.10	21 51 57.7	5.6	5.4	0.39
28	22 35	5 1 46.66	22 1 57.0	5.6	5.4	0.39
29	22 36	5 6 59.05	22 11 19.7	5.5	5.4	0.39
30	22 38	5 12 12.24	+22 20 5.3	5.5	5.4	0.39
July 1	22 39	5 17 26.18	+22 28 13.3	5.5	5.4	0.39

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	22 39	5 17 26.18	+22 28 13.3	5.5	5.4	0.39	Aug. 16	23 38	9 17 32.79	+16 55 29.3	5.1	5.0	0.35
2	22 40	5 22 40.83	22 35 43.4	5.5	5.4	0.39	17	23 39	9 22 29.61	16 34 16.2	5.1	5.0	0.35
3	22 42	5 27 56.15	22 42 35.1	5.5	5.3	0.39	18	23 40	9 27 25.37	16 12 35.3	5.1	5.0	0.35
4	22 43	5 33 12.10	22 48 48.1	5.5	5.3	0.39	19	23 41	9 32 20.08	15 50 27.4	5.1	5.0	0.35
5	22 44	5 38 28.63	22 54 22.1	5.5	5.3	0.39	20	23 41	9 37 13.76	15 27 53.0	5.1	5.0	0.34
6	22 46	5 43 45.68	+22 59 16.7	5.5	5.3	0.39	21	23 42	9 42 6.41	+15 4 52.9	5.1	5.0	0.34
7	22 47	5 49 3.20	23 3 31.5	5.4	5.3	0.38	22	23 43	9 46 58.03	14 41 27.6	5.1	5.0	0.34
8	22 48	5 54 21.14	23 7 6.4	5.4	5.3	0.38	23	23 44	9 51 48.65	14 17 37.9	5.1	5.0	0.34
9	22 50	5 59 39.45	23 10 1.3	5.4	5.3	0.38	24	23 45	9 56 38.29	13 53 24.5	5.1	5.0	0.34
10	22 51	6 4 58.09	23 12 15.8	5.4	5.3	0.38	25	23 46	10 1 26.96	13 28 48.1	5.1	5.0	0.34
11	22 52	6 10 16.98	+23 13 49.7	5.4	5.2	0.38	26	23 47	10 6 14.68	+13 3 49.4	5.1	5.0	0.34
12	22 54	6 15 36.08	23 14 43.0	5.4	5.2	0.38	27	23 48	10 11 1.47	12 38 29.1	5.1	5.0	0.34
13	22 55	6 20 55.33	23 14 55.6	5.4	5.2	0.38	28	23 49	10 15 47.34	12 12 47.9	5.1	5.0	0.34
14	22 57	6 26 14.68	23 14 27.4	5.4	5.2	0.38	29	23 49	10 20 32.33	11 46 46.4	5.1	5.0	0.34
15	22 58	6 31 34.06	23 13 18.3	5.4	5.2	0.38	30	23 50	10 25 16.46	11 20 25.3	5.1	5.0	0.34
16	22 59	6 36 53.41	+23 11 28.2	5.4	5.2	0.38	31	23 51	10 29 59.75	+10 53 45.5	5.1	5.0	0.34
17	23 1	6 42 12.69	23 8 57.2	5.3	5.2	0.38	Sept. 1	23 52	10 34 42.24	10 26 47.7	5.1	5.0	0.34
18	23 2	6 47 31.84	23 5 45.5	5.3	5.2	0.38	2	23 52	10 39 23.95	9 59 32.6	5.1	5.0	0.34
19	23 3	6 52 50.81	23 1 53.0	5.3	5.2	0.37	3	23 53	10 44 4.90	9 32 0.9	5.1	5.0	0.34
20	23 5	6 58 9.53	22 57 19.7	5.3	5.2	0.37	4	23 54	10 48 45.13	9 4 13.3	5.1	5.0	0.34
21	23 6	7 3 27.97	+22 52 5.9	5.3	5.2	0.37	5	23 55	10 53 24.67	+ 8 36 10.6	5.1	5.0	0.34
22	23 7	7 8 46.07	22 46 11.7	5.3	5.2	0.37	6	23 55	10 58 3.54	8 7 53.5	5.1	5.0	0.33
23	23 9	7 14 3.78	22 39 37.2	5.3	5.1	0.37	7	23 56	11 2 41.79	7 39 22.7	5.1	5.0	0.33
24	23 10	7 19 21.06	22 32 22.7	5.3	5.1	0.37	8	23 57	11 7 19.44	7 10 39.1	5.1	5.0	0.33
25	23 11	7 24 37.86	22 24 28.4	5.3	5.1	0.37	9	23 57	11 11 56.52	6 41 43.4	5.1	5.0	0.33
26	23 13	7 29 54.14	+22 15 54.6	5.3	5.1	0.37	10	23 58	11 16 33.06	+ 6 12 36.3	5.1	5.0	0.33
27	23 14	7 35 9.86	22 6 41.5	5.3	5.1	0.37	11	23 59	11 21 9.10	5 43 18.5	5.1	5.0	0.33
28	23 15	7 40 24.97	21 56 49.4	5.3	5.1	0.37	12	23 59	11 25 44.68	5 13 50.9	5.1	5.0	0.33
29	23 17	7 45 39.43	21 46 18.7	5.2	5.1	0.37	14	0 0	11 30 19.84	4 44 14.1	5.1	5.0	0.33
30	23 18	7 50 53.20	21 35 9.7	5.2	5.1	0.36	15	0 1	11 34 54.61	4 14 28.9	5.1	5.0	0.33
31	23 19	7 56 6.25	+21 23 22.7	5.2	5.1	0.36	16	0 1	11 39 29.02	+ 3 44 35.9	5.1	5.0	0.33
Aug. 1	23 20	8 1 18.53	21 10 58.2	5.2	5.1	0.36	17	0 2	11 44 3.13	3 14 36.0	5.1	5.0	0.33
2	23 22	8 6 30.02	20 57 56.7	5.2	5.1	0.36	18	0 2	11 48 36.97	2 44 29.8	5.1	5.0	0.33
3	23 23	8 11 40.68	20 44 18.5	5.2	5.1	0.36	19	0 3	11 53 10.58	2 14 18.2	5.1	5.0	0.33
4	23 24	8 16 50.48	20 30 4.1	5.2	5.1	0.36	20	0 4	11 57 44.00	1 44 1.8	5.1	5.0	0.33
5	23 25	8 21 59.39	+20 15 14.0	5.2	5.0	0.36	21	0 4	12 2 17.27	+ 1 13 41.3	5.1	5.0	0.33
6	23 27	8 27 7.39	19 59 48.8	5.2	5.0	0.36	22	0 5	12 6 50.44	0 43 17.5	5.1	5.0	0.33
7	23 28	8 32 14.46	19 43 48.9	5.2	5.0	0.36	23	0 5	12 11 23.56	+ 0 12 51.0	5.1	5.0	0.33
8	23 29	8 37 20.56	19 27 15.0	5.2	5.0	0.36	24	0 6	12 15 56.67	− 0 17 37.4	5.1	5.0	0.33
9	23 30	8 42 25.68	19 10 7.6	5.2	5.0	0.36	25	0 7	12 20 29.81	0 48 7.0	5.1	5.0	0.33
10	23 31	8 47 29.80	+18 52 27.3	5.2	5.0	0.35	26	0 7	12 25 3.03	− 1 18 37.0	5.1	5.0	0.33
11	23 32	8 52 32.90	18 34 14.7	5.2	5.0	0.35	27	0 8	12 29 36.36	1 49 6.8	5.1	5.0	0.33
12	23 33	8 57 34.97	18 15 30.4	5.2	5.0	0.35	28	0 9	12 34 9.85	2 19 35.6	5.1	5.0	0.33
13	23 34	9 2 36.00	17 56 15.1	5.2	5.0	0.35	29	0 9	12 38 43.55	2 50 2.6	5.1	5.0	0.33
14	23 36	9 7 35.98	17 36 29.4	5.1	5.0	0.35	30	0 10	12 43 17.50	3 20 27.2	5.1	5.0	0.33
15	23 37	9 12 34.91	+17 16 13.9	5.1	5.0	0.35	Oct. 1	0 10	12 47 51.74	− 3 50 48.5	5.1	5.0	0.33
16	23 38	9 17 32.79	+16 55 29.3	5.1	5.0	0.35	2	0 11	12 52 26.32	− 4 21 5.8	5.1	5.0	0.33

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	0 10	12 47 51.74	− 3 50 48.5	5.1	5.0	0.33	Nov. 16	0 54	16 33 7.02	−22 24 11.3	5.4	5.3	0.38
2	0 11	12 52 26.32	4 21 5.8	5.1	5.0	0.33	17	0 56	16 38 26.97	22 37 21.4	5.5	5.3	0.38
3	0 12	12 57 1.28	4 51 18.4	5.1	5.0	0.33	18	0 57	16 43 47.88	22 49 51.8	5.5	5.3	0.38
4	0 12	13 1 36.66	5 21 25.5	5.2	5.0	0.34	19	0 58	16 49 9.73	23 1 41.9	5.5	5.3	0.39
5	0 13	13 6 12.50	5 51 26.4	5.2	5.0	0.34	20	1 0	16 54 32.49	23 12 51.3	5.5	5.3	0.39
6	0 14	13 10 48.84	− 6 21 20.2	5.2	5.0	0.34	21	1 1	16 59 56.10	−23 23 19.4	5.5	5.3	0.39
7	0 14	13 15 25.72	6 51 6.2	5.2	5.0	0.34	22	1 3	17 5 20.51	23 33 5.6	5.5	5.3	0.39
8	0 15	13 20 3.18	7 20 43.6	5.2	5.0	0.34	23	1 4	17 10 45.68	23 42 9.6	5.5	5.3	0.39
9	0 16	13 24 41.26	7 50 11.6	5.2	5.0	0.34	24	1 6	17 16 11.55	23 50 30.9	5.5	5.4	0.39
10	0 16	13 29 20.00	8 19 29.5	5.2	5.0	0.34	25	1 7	17 21 38.08	23 58 9.1	5.5	5.4	0.39
11	0 17	13 33 59.43	− 8 48 36.4	5.2	5.0	0.34	26	1 9	17 27 5.21	−24 5 3.8	5.5	5.4	0.39
12	0 18	13 38 39.57	9 17 31.5	5.2	5.0	0.34	27	1 10	17 32 32.89	24 11 14.7	5.6	5.4	0.39
13	0 18	13 43 20.47	9 46 14.1	5.2	5.0	0.34	28	1 12	17 38 1.04	24 16 41.4	5.6	5.4	0.40
14	0 19	13 48 2.17	10 14 43.3	5.2	5.0	0.34	29	1 13	17 43 29.61	24 21 23.7	5.6	5.4	0.40
15	0 20	13 52 44.70	10 42 58.4	5.2	5.0	0.34	30	1 15	17 48 58.55	24 25 21.4	5.6	5.4	0.40
16	0 21	13 57 28.10	−11 10 58.6	5.2	5.1	0.34	Dec. 1	1 16	17 54 27.78	−24 28 34.2	5.6	5.4	0.40
17	0 22	14 2 12.39	11 38 43.2	5.2	5.1	0.34	2	1 18	17 59 57.24	24 31 1.9	5.6	5.5	0.40
18	0 22	14 6 57.60	12 6 11.3	5.2	5.1	0.34	3	1 19	18 5 26.87	24 32 44.5	5.6	5.5	0.40
19	0 23	14 11 43.78	12 33 22.1	5.2	5.1	0.35	4	1 21	18 10 56.59	24 33 41.7	5.7	5.5	0.40
20	0 24	14 16 30.96	13 0 14.9	5.2	5.1	0.35	5	1 23	18 16 26.34	24 33 53.5	5.7	5.5	0.40
21	0 25	14 21 19.16	−13 26 48.8	5.2	5.1	0.35	6	1 24	18 21 56.03	−24 33 19.8	5.7	5.5	0.40
22	0 26	14 26 8.40	13 53 3.2	5.2	5.1	0.35	7	1 26	18 27 25.61	24 32 0.7	5.7	5.5	0.41
23	0 27	14 30 58.73	14 18 57.2	5.2	5.1	0.35	8	1 27	18 32 55.00	24 29 56.3	5.7	5.5	0.41
24	0 28	14 35 50.17	14 44 29.9	5.3	5.1	0.35	9	1 29	18 38 24.12	24 27 6.5	5.7	5.5	0.41
25	0 29	14 40 42.75	15 9 40.5	5.3	5.1	0.35	10	1 30	18 43 52.91	24 23 31.6	5.7	5.5	0.41
26	0 30	14 45 36.47	−15 34 28.4	5.3	5.1	0.35	11	1 32	18 49 21.30	−24 19 11.7	5.7	5.6	0.41
27	0 31	14 50 31.38	15 58 52.7	5.3	5.1	0.36	12	1 33	18 54 49.22	24 14 7.1	5.8	5.6	0.41
28	0 32	14 55 27.48	16 22 52.6	5.3	5.1	0.36	13	1 35	19 0 16.60	24 8 17.8	5.8	5.6	0.41
29	0 33	15 0 24.79	16 46 27.3	5.3	5.1	0.36	14	1 36	19 5 43.37	24 1 44.1	5.8	5.6	0.41
30	0 34	15 5 23.32	17 9 36.1	5.3	5.1	0.36	15	1 38	19 11 9.47	23 54 26.4	5.8	5.6	0.41
31	0 35	15 10 23.10	−17 32 18.1	5.3	5.1	0.36	16	1 39	19 16 34.86	−23 46 25.0	5.8	5.6	0.41
Nov. 1	0 36	15 15 24.13	17 54 32.5	5.3	5.1	0.36	17	1 41	19 21 59.48	23 37 40.4	5.8	5.7	0.41
2	0 37	15 20 26.41	18 16 18.5	5.3	5.2	0.36	18	1 42	19 27 23.25	23 28 12.8	5.8	5.7	0.42
3	0 38	15 25 29.94	18 37 35.2	5.3	5.2	0.36	19	1 44	19 32 46.13	23 18 2.6	5.9	5.7	0.42
4	0 39	15 30 34.74	18 58 22.0	5.3	5.2	0.37	20	1 45	19 38 8.07	23 7 10.2	5.9	5.7	0.42
5	0 40	15 35 40.81	−19 18 38.1	5.3	5.2	0.37	21	1 46	19 43 29.02	−22 55 36.2	5.9	5.7	0.42
6	0 41	15 40 48.13	19 38 22.6	5.3	5.2	0.37	22	1 48	19 48 48.95	22 43 21.1	5.9	5.7	0.42
7	0 43	15 45 56.70	19 57 34.8	5.4	5.2	0.37	23	1 49	19 54 7.80	22 30 25.3	5.9	5.8	0.42
8	0 44	15 51 6.50	20 16 13.9	5.4	5.2	0.37	24	1 51	19 59 25.53	22 16 49.4	5.9	5.8	0.42
9	0 45	15 56 17.51	20 34 19.2	5.4	5.2	0.37	25	1 52	20 4 42.11	22 2 33.9	6.0	5.8	0.42
10	0 46	16 1 29.73	−20 51 50.1	5.4	5.2	0.37	26	1 53	20 9 57.51	−21 47 39.5	6.0	5.8	0.42
11	0 47	16 6 43.14	21 8 45.7	5.4	5.2	0.38	27	1 54	20 15 11.69	21 32 6.7	6.0	5.8	0.42
12	0 49	16 11 57.70	21 25 5.4	5.4	5.2	0.38	28	1 56	20 20 24.63	21 15 56.1	6.0	5.9	0.42
13	0 50	16 17 13.39	21 40 48.4	5.4	5.3	0.38	29	1 57	20 25 36.30	20 59 8.4	6.0	5.9	0.42
14	0 51	16 22 30.19	21 55 54.2	5.4	5.3	0.38	30	1 58	20 30 46.68	20 41 44.3	6.1	5.9	0.42
15	0 53	16 27 48.08	−22 10 22.0	5.4	5.3	0.38	31	1 59	20 35 55.74	−20 23 44.4	6.1	5.9	0.42
16	0 54	16 33 7.02	−22 24 11.3	5.4	5.3	0.38	32	2 1	20 41 3.47	−20 5 9.3	6.1	5.9	0.42

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	19 16	7 56 58.47	+21 41 13.5	5.7	3.2	0.24	Nov. 16	17 49	9 31 5.97	+16 48 0.6	7.4	4.3	0.30
2	19 15	7 59 22.58	21 35 41.5	5.7	3.3	0.24	17	17 47	9 32 41.94	16 42 4.2	7.5	4.3	0.30
3	19 13	8 1 45.88	21 30 4.4	5.7	3.3	0.24	18	17 45	9 34 16.52	16 36 12.7	7.5	4.3	0.30
4	19 12	8 4 8.38	21 24 22.3	5.8	3.3	0.24	19	17 42	9 35 49.67	16 30 26.4	7.6	4.3	0.30
5	19 10	8 6 30.07	21 18 35.4	5.8	3.4	0.24	20	17 40	9 37 21.39	16 24 45.5	7.6	4.4	0.31
6	19 9	8 8 50.91	+21 12 44.0	5.8	3.4	0.24	21	17 37	9 38 51.64	+16 19 10.2	7.7	4.4	0.31
7	19 7	8 11 10.90	21 6 48.2	5.9	3.4	0.24	22	17 35	9 40 20.41	16 13 40.8	7.7	4.4	0.31
8	19 5	8 13 30.04	21 0 48.2	5.9	3.5	0.24	23	17 33	9 41 47.66	16 8 17.7	7.8	4.5	0.31
9	19 4	8 15 48.32	20 54 44.1	5.9	3.5	0.24	24	17 30	9 43 13.37	16 3 1.2	7.8	4.5	0.31
10	19 2	8 18 5.71	20 48 36.2	6.0	3.5	0.24	25	17 27	9 44 37.52	15 57 51.6	7.9	4.5	0.32
11	19 0	8 20 22.23	+20 42 24.8	6.0	3.5	0.24	26	17 25	9 46 0.06	+15 52 49.2	8.0	4.6	0.32
12	18 59	8 22 37.86	20 36 10.0	6.0	3.5	0.24	27	17 22	9 47 20.97	15 47 54.2	8.0	4.6	0.32
13	18 57	8 24 52.58	20 29 51.8	6.0	3.5	0.24	28	17 20	9 48 40.23	15 43 6.9	8.1	4.7	0.32
14	18 55	8 27 6.40	20 23 30.6	6.1	3.5	0.24	29	17 17	9 49 57.80	15 38 27.6	8.1	4.7	0.33
15	18 54	8 29 19.32	20 17 6.7	6.1	3.5	0.25	30	17 14	9 51 13.64	15 33 56.7	8.2	4.7	0.33
16	18 52	8 31 31.32	+20 10 40.0	6.1	3.5	0.25	Dec. 1	17 12	9 52 27.71	+15 29 34.6	8.3	4.8	0.33
17	18 50	8 33 42.39	20 4 10.7	6.2	3.5	0.25	2	17 9	9 53 39.97	15 25 21.5	8.3	4.8	0.33
18	18 48	8 35 52.53	19 57 39.2	6.2	3.5	0.25	3	17 6	9 54 50.40	15 21 17.9	8.4	4.9	0.33
19	18 47	8 38 1.73	19 51 5.5	6.2	3.6	0.26	4	17 3	9 55 58.95	15 17 24.0	8.5	4.9	0.34
20	18 45	8 40 9.98	19 44 29.9	6.3	3.6	0.26	5	17 1	9 57 5.59	15 13 40.1	8.6	4.9	0.34
21	18 43	8 42 17.27	+19 37 52.6	6.3	3.6	0.26	6	16 58	9 58 10.28	+15 10 6.5	8.6	5.0	0.34
22	18 41	8 44 23.59	19 31 13.8	6.4	3.6	0.26	7	16 55	9 59 13.00	15 6 43.5	8.7	5.0	0.34
23	18 39	8 46 28.94	19 24 33.7	6.4	3.6	0.26	8	16 52	10 0 13.70	15 3 31.3	8.8	5.1	0.35
24	18 37	8 48 33.31	19 17 52.4	6.5	3.7	0.26	9	16 49	10 1 12.34	15 0 30.2	8.9	5.1	0.35
25	18 35	8 50 36.67	19 11 10.2	6.5	3.7	0.26	10	16 46	10 2 8.90	14 57 40.6	8.9	5.1	0.35
26	18 34	8 52 39.02	+19 4 27.3	6.6	3.7	0.26	11	16 43	10 3 3.35	+14 55 2.6	9.0	5.2	0.35
27	18 32	8 54 40.34	18 57 44.0	6.6	3.8	0.26	12	16 40	10 3 55.65	14 52 36.6	9.0	5.2	0.35
28	18 30	8 56 40.62	18 51 0.6	6.6	3.8	0.26	13	16 37	10 4 45.77	14 50 22.7	9.1	5.3	0.36
29	18 28	8 58 39.85	18 44 17.2	6.7	3.8	0.27	14	16 34	10 5 33.66	14 48 21.3	9.2	5.3	0.36
30	18 26	9 0 38.01	18 37 34.0	6.7	3.8	0.27	15	16 30	10 6 19.29	14 46 32.5	9.3	5.3	0.36
31	18 24	9 2 35.06	+18 30 51.3	6.7	3.8	0.27	16	16 27	10 7 2.62	+14 44 56.7	9.4	5.4	0.37
Nov. 1	18 22	9 4 31.02	18 24 9.4	6.8	3.9	0.27	17	16 24	10 7 43.62	14 43 34.1	9.4	5.4	0.37
2	18 20	9 6 25.86	18 17 28.5	6.8	3.9	0.27	18	16 21	10 8 22.24	14 42 25.2	9.5	5.5	0.37
3	18 18	9 8 19.55	18 10 48.9	6.8	3.9	0.27	19	16 17	10 8 58.44	14 41 30.2	9.6	5.5	0.38
4	18 16	9 10 12.08	18 4 10.7	6.9	3.9	0.28	20	16 14	10 9 32.17	14 40 49.1	9.7	5.6	0.38
5	18 14	9 12 3.44	+17 57 34.3	6.9	4.0	0.28	21	16 11	10 10 3.40	+14 40 22.4	9.8	5.6	0.39
6	18 12	9 13 53.61	17 51 0.0	7.0	4.0	0.28	22	16 7	10 10 32.08	14 40 10.3	9.8	5.6	0.39
7	18 10	9 15 42.56	17 44 28.0	7.0	4.0	0.28	23	16 4	10 10 58.15	14 40 13.1	9.9	5.7	0.39
8	18 7	9 17 30.29	17 37 58.5	7.1	4.0	0.28	24	16 0	10 11 21.58	14 40 31.0	10.0	5.8	0.39
9	18 5	9 19 16.77	17 31 31.8	7.1	4.0	0.28	25	15 57	10 11 42.31	14 41 4.2	10.1	5.8	0.40
10	18 3	9 21 1.98	+17 25 8.0	7.1	4.1	0.29	26	15 53	10 12 0.31	+14 41 52.9	10.2	5.9	0.40
11	18 1	9 22 45.92	17 18 47.4	7.2	4.1	0.29	27	15 49	10 12 15.55	14 42 57.4	10.2	5.9	0.40
12	17 58	9 24 28.57	17 12 30.2	7.2	4.1	0.29	28	15 45	10 12 27.95	14 44 17.9	10.3	6.0	0.41
13	17 56	9 26 9.91	17 6 16.7	7.3	4.2	0.29	29	15 42	10 12 37.47	14 45 54.6	10.4	6.0	0.41
14	17 54	9 27 49.93	17 0 7.1	7.3	4.2	0.29	30	15 38	10 12 44.08	14 47 47.7	10.5	6.1	0.41
15	17 52	9 29 28.63	+16 54 1.6	7.4	4.2	0.29	31	15 34	10 12 47.73	+14 49 57.2	10.6	6.1	0.42
16	17 49	9 31 5.97	+16 48 0.6	7.4	4.3	0.30	32	15 30	10 12 48.38	+14 52 23.4	10.6	6.1	0.42

Stellar magnitude at opposition, in February, 1916, −1.0.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
July 1	17 17	23 54 51.99	−1 57 13.4	1.9	20.1	1.43
2	17 14	23 55 4.07	1 56 14.3	1.9	20.2	1.43
3	17 10	23 55 15.48	1 55 19.7	1.9	20.3	1.44
4	17 6	23 55 26.21	1 54 29.6	1.9	20.3	1.44
5	17 2	23 55 36.25	1 53 44.0	1.9	20.4	1.45
6	16 59	23 55 45.60	−1 53 2.9	1.9	20.5	1.45
7	16 55	23 55 54.26	1 52 26.3	1.9	20.5	1.46
8	16 51	23 56 2.23	1 51 54.2	1.9	20.6	1.46
9	16 47	23 56 9.50	1 51 26.7	1.9	20.7	1.47
10	16 43	23 56 16.07	1 51 3.9	1.9	20.7	1.47
11	16 39	23 56 21.93	−1 50 45.7	1.9	20.8	1.48
12	16 36	23 56 27.07	1 50 32.2	2.0	20.9	1.48
13	16 32	23 56 31.50	1 50 23.3	2.0	20.9	1.49
14	16 28	23 56 35.22	1 50 19.0	2.0	21.0	1.49
15	16 24	23 56 38.23	1 50 19.3	2.0	21.0	1.50
16	16 20	23 56 40.53	−1 50 24.3	2.0	21.1	1.50
17	16 16	23 56 42.11	1 50 34.0	2.0	21.2	1.51
18	16 12	23 56 42.97	1 50 48.3	2.0	21.2	1.51
19	16 8	23 56 43.12	1 51 7.1	2.0	21.3	1.51
20	16 4	23 56 42.55	1 51 30.5	2.0	21.4	1.52
21	16 1	23 56 41.27	−1 51 58.6	2.0	21.4	1.52
22	15 57	23 56 39.27	1 52 31.2	2.0	21.5	1.53
23	15 53	23 56 36.56	1 53 8.4	2.0	21.6	1.53
24	15 49	23 56 33.13	1 53 50.2	2.0	21.6	1.54
25	15 45	23 56 28.98	1 54 36.5	2.0	21.7	1.54
26	15 41	23 56 24.13	−1 55 27.4	2.0	21.8	1.55
27	15 37	23 56 18.57	1 56 22.8	2.0	21.8	1.55
28	15 33	23 56 12.30	1 57 22.7	2.0	21.9	1.56
29	15 28	23 56 5.32	1 58 27.1	2.1	22.0	1.56
30	15 24	23 55 57.63	1 59 36.0	2.1	22.0	1.57
31	15 20	23 55 49.25	−2 0 49.3	2.1	22.1	1.57
Aug. 1	15 16	23 55 40.16	2 2 7.0	2.1	22.1	1.57
2	15 12	23 55 30.36	2 3 29.2	2.1	22.2	1.58
3	15 8	23 55 19.87	2 4 55.7	2.1	22.3	1.58
4	15 4	23 55 8.70	2 6 26.6	2.1	22.3	1.59
5	15 0	23 54 56.84	−2 8 1.8	2.1	22.4	1.59
6	14 56	23 54 44.30	2 9 41.2	2.1	22.5	1.60
7	14 52	23 54 31.08	2 11 24.7	2.1	22.5	1.60
8	14 47	23 54 17.21	2 13 12.4	2.1	22.6	1.60
9	14 43	23 54 2.68	2 15 4.1	2.1	22.6	1.61
10	14 39	23 53 47.50	−2 16 59.8	2.1	22.7	1.61
11	14 35	23 53 31.68	2 18 59.5	2.1	22.7	1.61
12	14 31	23 53 15.22	2 21 3.0	2.1	22.8	1.62
13	14 26	23 52 58.15	2 23 10.3	2.1	22.8	1.62
14	14 22	23 52 40.46	2 25 21.2	2.1	22.9	1.62
15	14 18	23 52 22.18	−2 27 35.8	2.1	22.9	1.63
16	14 14	23 52 3.30	−2 29 53.9	2.1	23.0	1.63
Aug. 16	14 14	23 52 3.30	−2 29 53.9	2.1	23.0	1.63
17	14 9	23 51 43.85	2 32 15.4	2.2	23.0	1.64
18	14 5	23 51 23.84	2 34 40.3	2.2	23.1	1.64
19	14 1	23 51 3.29	2 37 8.4	2.2	23.1	1.64
20	13 57	23 50 42.20	2 39 39.7	2.2	23.2	1.65
21	13 52	23 50 20.58	−2 42 14.0	2.2	23.2	1.65
22	13 48	23 49 58.45	2 44 51.3	2.2	23.2	1.65
23	13 44	23 49 35.82	2 47 31.4	2.2	23.3	1.66
24	13 39	23 49 12.71	2 50 14.3	2.2	23.3	1.66
25	13 35	23 48 49.14	2 52 59.8	2.2	23.3	1.66
26	13 31	23 48 25.11	−2 55 47.8	2.2	23.4	1.66
27	13 26	23 48 0.64	2 58 38.3	2.2	23.4	1.66
28	13 22	23 47 35.75	3 1 31.2	2.2	23.4	1.67
29	13 18	23 47 10.45	3 4 26.4	2.2	23.5	1.67
30	13 13	23 46 44.76	3 7 23.6	2.2	23.5	1.67
31	13 9	23 46 18.71	−3 10 22.8	2.2	23.5	1.67
Sept. 1	13 5	23 45 52.30	3 13 23.8	2.2	23.6	1.68
2	13 0	23 45 25.55	3 16 26.6	2.2	23.6	1.68
3	12 56	23 44 58.49	3 19 31.0	2.2	23.6	1.68
4	12 52	23 44 31.12	3 22 36.9	2.2	23.6	1.68
5	12 47	23 44 3.46	−3 25 44.1	2.2	23.7	1.68
6	12 43	23 43 35.54	3 28 52.6	2.2	23.7	1.68
7	12 38	23 43 7.39	3 32 2.1	2.2	23.7	1.68
8	12 34	23 42 39.03	3 35 12.4	2.2	23.7	1.69
9	12 29	23 42 10.47	3 38 23.5	2.2	23.7	1.69
10	12 25	23 41 41.74	−3 41 35.2	2.2	23.7	1.69
11	12 21	23 41 12.87	3 44 47.3	2.2	23.7	1.69
12	12 16	23 40 43.87	3 47 59.7	2.2	23.7	1.69
13	12 12	23 40 14.77	3 51 12.2	2.2	23.7	1.69
14	12 7	23 39 45.59	3 54 24.6	2.2	23.7	1.69
15	12 3	23 39 16.35	−3 57 36.9	2.2	23.7	1.69
16	11 59	23 38 47.07	4 0 48.9	2.2	23.7	1.69
17	11 54	23 38 17.78	4 4 0.5	2.2	23.7	1.69
18	11 50	23 37 48.49	4 7 11.5	2.2	23.7	1.69
19	11 45	23 37 19.23	4 10 21.8	2.2	23.7	1.69
20	11 41	23 36 50.02	−4 13 31.1	2.2	23.7	1.69
21	11 37	23 36 20.88	4 16 39.4	2.2	23.7	1.69
22	11 32	23 35 51.83	4 19 46.6	2.2	23.7	1.69
23	11 28	23 35 22.90	4 22 52.6	2.2	23.7	1.69
24	11 23	23 34 54.11	4 25 57.2	2.2	23.7	1.69
25	11 19	23 34 25.48	−4 29 0.2	2.2	23.7	1.69
26	11 14	23 33 57.02	4 32 1.4	2.2	23.7	1.68
27	11 10	23 33 28.76	4 35 0.9	2.2	23.7	1.68
28	11 6	23 33 0.72	4 37 58.5	2.2	23.6	1.68
29	11 1	23 32 32.91	4 40 54.1	2.2	23.6	1.68
30	10 57	23 32 5.35	−4 43 47.4	2.2	23.6	1.68
Oct. 1	10 53	23 31 38.08	−4 46 38.4	2.2	23.6	1.68

Stellar magnitude at opposition, in September, 1915, −2.5.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Oct. 1	10 53	23 31 38.08	−4 46 38.4	2.2	23.6	1.68
2	10 48	23 31 11.12	4 49 27.0	2.2	23.5	1.68
3	10 44	23 30 44.49	4 52 13.1	2.2	23.5	1.67
4	10 39	23 30 18.19	4 54 56.5	2.2	23.5	1.67
5	10 35	23 29 52.25	4 57 37.0	2.2	23.4	1.67
6	10 31	23 29 26.70	−5 0 14.5	2.2	23.4	1.67
7	10 26	23 29 1.55	5 2 48.9	2.2	23.4	1.66
8	10 22	23 28 36.82	5 5 20.2	2.2	23.3	1.66
9	10 18	23 28 12.54	5 7 48.2	2.2	23.3	1.66
10	10 13	23 27 48.72	5 10 12.8	2.2	23.2	1.66
11	10 9	23 27 25.37	−5 12 33.9	2.2	23.2	1.65
12	10 5	23 27 2.51	5 14 51.4	2.2	23.2	1.65
13	10 0	23 26 40.16	5 17 5.2	2.2	23.1	1.65
14	9 56	23 26 18.34	5 19 15.2	2.2	23.1	1.64
15	9 52	23 25 57.07	5 21 21.3	2.2	23.0	1.64
16	9 47	23 25 36.36	−5 23 23.5	2.2	23.0	1.64
17	9 43	23 25 16.21	5 25 21.7	2.1	22.9	1.63
18	9 39	23 24 56.64	5 27 15.7	2.1	22.9	1.63
19	9 35	23 24 37.66	5 29 5.6	2.1	22.8	1.63
20	9 30	23 24 19.28	5 30 51.3	2.1	22.8	1.62
21	9 26	23 24 1.53	−5 32 32.7	2.1	22.7	1.62
22	9 22	23 23 44.41	5 34 9.8	2.1	22.7	1.62
23	9 18	23 23 27.92	5 35 42.5	2.1	22.6	1.61
24	9 14	23 23 12.08	5 37 10.8	2.1	22.6	1.61
25	9 9	23 22 56.90	5 38 34.6	2.1	22.5	1.60
26	9 5	23 22 42.38	−5 39 53.9	2.1	22.4	1.60
27	9 1	23 22 28.54	5 41 8.7	2.1	22.4	1.60
28	8 57	23 22 15.39	5 42 18.9	2.1	22.3	1.59
29	8 53	23 22 2.94	5 43 24.4	2.1	22.3	1.59
30	8 49	23 21 51.18	5 44 25.2	2.1	22.2	1.58
31	8 45	23 21 40.13	−5 45 21.2	2.1	22.2	1.58
Nov. 1	8 40	23 21 29.79	5 46 12.5	2.1	22.1	1.57
2	8 36	23 21 20.17	5 46 59.0	2.1	22.0	1.57
3	8 32	23 21 11.28	5 47 40.7	2.0	22.0	1.56
4	8 28	23 21 3.13	5 48 17.6	2.0	21.9	1.56
5	8 24	23 20 55.72	−5 48 49.6	2.0	21.8	1.55
6	8 20	23 20 49.05	5 49 16.6	2.0	21.8	1.55
7	8 16	23 20 43.13	5 49 38.7	2.0	21.7	1.55
8	8 12	23 20 37.98	5 49 55.8	2.0	21.6	1.54
9	8 8	23 20 33.58	5 50 8.0	2.0	21.6	1.54
10	8 4	23 20 29.94	−5 50 15.3	2.0	21.5	1.53
11	8 0	23 20 27.06	5 50 17.6	2.0	21.4	1.53
12	7 56	23 20 24.94	5 50 14.9	2.0	21.4	1.52
13	7 52	23 20 23.57	5 50 7.3	2.0	21.3	1.52
14	7 48	23 20 22.97	5 49 54.8	2.0	21.2	1.51
15	7 44	23 20 23.13	−5 49 37.4	2.0	21.2	1.51
16	7 40	23 20 24.06	−5 49 15.2	2.0	21.1	1.50
Nov. 16	7 40	23 20 24.06	−5 49 15.2	2.0	21.1	1.50
17	7 36	23 20 25.74	5 48 48.1	2.0	21.0	1.50
18	7 33	23 20 28.17	5 48 16.1	2.0	21.0	1.49
19	7 29	23 20 31.37	5 47 39.3	2.0	20.9	1.49
20	7 25	23 20 35.32	5 46 57.7	1.9	20.8	1.48
21	7 21	23 20 40.02	−5 46 11.2	1.9	20.8	1.48
22	7 17	23 20 45.48	5 45 19.9	1.9	20.7	1.47
23	7 13	23 20 51.68	5 44 23.9	1.9	20.6	1.47
24	7 10	23 20 58.61	5 43 23.2	1.9	20.6	1.46
25	7 6	23 21 6.28	5 42 17.8	1.9	20.5	1.46
26	7 2	23 21 14.70	−5 41 7.7	1.9	20.4	1.45
27	6 58	23 21 23.85	5 39 52.9	1.9	20.4	1.45
28	6 54	23 21 33.72	5 38 33.4	1.9	20.3	1.44
29	6 51	23 21 44.33	5 37 9.2	1.9	20.2	1.44
30	6 47	23 21 55.66	5 35 40.5	1.9	20.2	1.43
Dec. 1	6 43	23 22 7.71	−5 34 7.2	1.9	20.1	1.43
2	6 39	23 22 20.49	5 32 29.4	1.9	20.0	1.43
3	6 36	23 22 33.99	5 30 46.9	1.9	20.0	1.42
4	6 32	23 22 48.19	5 29 0.0	1.9	19.9	1.42
5	6 28	23 23 3.09	5 27 8.6	1.9	19.8	1.41
6	6 25	23 23 18.69	−5 25 12.8	1.8	10.8	1.41
7	6 21	23 23 34.99	5 23 12.6	1.8	19.7	1.40
8	6 17	23 23 51.98	5 21 8.0	1.8	19.6	1.40
9	6 14	23 24 9.65	5 18 59.1	1.8	19.6	1.40
10	6 10	23 24 28.00	5 16 45.9	1.8	19.5	1.39
11	6 6	23 24 47.02	−5 14 28.4	1.8	19.4	1.39
12	6 3	23 25 6.71	5 12 6.8	1.8	19.4	1.38
13	5 59	23 25 27.06	5 9 41.0	1.8	19.3	1.38
14	5 56	23 25 48.05	5 7 11.1	1.8	19.2	1.37
15	5 52	23 26 9.69	5 4 37.2	1.8	19.2	1.37
16	5 49	23 26 31.95	−5 1 59.2	1.8	19.1	1.36
17	5 45	23 26 54.84	4 59 17.3	1.8	19.1	1.36
18	5 41	23 27 18.35	4 56 31.5	1.8	19.0	1.35
19	5 38	23 27 42.48	4 53 41.9	1.8	18.9	1.35
20	5 34	23 28 7.21	4 50 48.5	1.8	18.9	1.35
21	5 31	23 28 32.53	−4 47 51.2	1.8	18.8	1.34
22	5 27	23 28 58.46	4 44 50.2	1.8	18.8	1.34
23	5 24	23 29 24.98	4 41 45.4	1.8	18.7	1.33
24	5 20	23 29 52.07	4 38 36.9	1.7	18.6	1.33
25	5 17	23 30 19.73	4 35 24.9	1.7	18.6	1.33
26	5 13	23 30 47.96	−4 32 9.3	1.7	18.5	1.32
27	5 10	23 31 16.74	4 28 50.2	1.7	18.5	1.32
28	5 7	23 31 46.07	4 25 27.5	1.7	18.4	1.31
29	5 3	23 32 15.95	4 22 1.4	1.7	18.4	1.31
30	5 0	23 32 46.38	4 18 31.8	1.7	18.3	1.31
31	4 56	23 33 17.34	−4 14 58.9	1.7	18.3	1.30
32	4 53	23 33 48.83	−4 11 22.6	1.7	18.2	1.30

Stellar magnitude at opposition, in September, 1915, −2.5.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
an. 0	11 12	5 51 14.13	+22 18 50.4	1.1	9.6	0.76	Feb. 15	8 1	5 40 22.43	+22 23 1.2	1.0	9.1	0.72
1	11 8	5 50 53.51	22 18 53.7	1.1	9.6	0.76	16	7 57	5 40 17.72	22 23 10.9	1.0	9.1	0.72
2	11 4	5 50 33.02	22 18 57.1	1.1	9.6	0.76	17	7 53	5 40 13.49	22 23 20.8	1.0	9.1	0.72
3	10 59	5 50 12.69	22 19 0.4	1.1	9.6	0.76	18	7 49	5 40 9.75	22 23 30.9	1.0	9.1	0.72
4	10 55	5 49 52.52	22 19 3.8	1.1	9.6	0.76	19	7 45	5 40 6.49	22 23 41.3	1.0	9.1	0.72
5	10 51	5 49 32.52	+22 19 7.2	1.1	9.6	0.76	20	7 41	5 40 3.72	+22 23 51.9	1.0	9.0	0.71
6	10 47	5 49 12.71	22 19 10.6	1.1	9.6	0.76	21	7 37	5 40 1.44	22 24 2.7	1.0	9.0	0.71
7	10 42	5 48 53.10	22 19 14.0	1.1	9.6	0.76	22	7 33	5 39 59.64	22 24 13.8	1.0	9.0	0.71
8	10 38	5 48 33.70	22 19 17.5	1.1	9.6	0.76	23	7 29	5 39 58.33	22 24 25.1	1.0	9.0	0.71
9	10 34	5 48 14.52	22 19 21.0	1.1	9.6	0.76	24	7 25	5 39 57.50	22 24 36.6	1.0	9.0	0.71
10	10 30	5 47 55.57	+22 19 24.6	1.1	9.6	0.76	25	7 21	5 39 57.15	+22 24 48.4	1.0	9.0	0.71
11	10 25	5 47 36.85	22 19 28.3	1.1	9.6	0.75	26	7 17	5 39 57.30	22 25 0.4	1.0	8.9	0.71
12	10 21	5 47 18.39	22 19 32.0	1.1	9.6	0.75	27	7 13	5 39 57.94	22 25 12.6	1.0	8.9	0.71
13	10 17	5 47 0.20	22 19 35.8	1.1	9.5	0.75	28	7 9	5 39 59.07	22 25 25.1	1.0	8.9	0.70
14	10 13	5 46 42.28	22 19 39.7	1.1	9.5	0.75	Mar. 1	7 5	5 40 0.68	22 25 37.8	1.0	8.9	0.70
15	10 8	5 46 24.64	+22 19 43.7	1.1	9.5	0.75	2	7 1	5 40 2.77	+22 25 50.7	1.0	8.9	0.70
16	10 4	5 46 7.30	22 19 47.8	1.1	9.5	0.75	3	6 57	5 40 5.34	22 26 3.8	1.0	8.9	0.70
17	10 0	5 45 50.26	22 19 51.9	1.1	9.5	0.75	4	6 54	5 40 8.38	22 26 17.1	1.0	8.8	0.70
18	9 56	5 45 33.54	22 19 56.2	1.1	9.5	0.75	5	6 50	5 40 11.92	22 26 30.6	1.0	8.8	0.70
19	9 52	5 45 17.14	22 20 0.6	1.1	9.5	0.75	6	6 46	5 40 15.94	22 26 44.3	1.0	8.8	0.70
20	9 47	5 45 1.07	+22 20 5.1	1.1	9.5	0.75	7	6 42	5 40 20.43	+22 26 58.3	1.0	8.8	0.70
21	9 43	5 44 45.35	22 20 9.7	1.1	9.5	0.75	8	6 38	5 40 25.40	22 27 12.4	1.0	8.8	0.69
22	9 39	5 44 29.98	22 20 14.4	1.1	9.5	0.75	9	6 34	5 40 30.86	22 27 26.7	1.0	8.8	0.69
23	9 35	5 44 14.96	22 20 19.3	1.1	9.4	0.75	10	6 30	5 40 36.79	22 27 41.2	1.0	8.8	0.69
24	9 31	5 44 0.31	22 20 24.3	1.1	9.4	0.74	11	6 27	5 40 43.19	22 27 55.9	1.0	8.7	0.69
25	9 27	5 43 46.03	+22 20 29.5	1.1	9.4	0.74	12	6 23	5 40 50.07	+22 28 10.7	1.0	8.7	0.69
26	9 22	5 43 32.13	22 20 34.8	1.1	9.4	0.74	13	6 19	5 40 57.43	22 28 25.7	1.0	8.7	0.69
27	9 18	5 43 18.62	22 20 40.2	1.1	9.4	0.74	14	6 15	5 41 5.25	22 28 40.9	1.0	8.7	0.69
28	9 14	5 43 5.50	22 20 45.9	1.1	9.4	0.74	15	6 11	5 41 13.54	22 28 56.2	1.0	8.7	0.69
29	9 10	5 42 52.77	22 20 51.7	1.1	9.4	0.74	16	6 8	5 41 22.30	22 29 11.6	1.0	8.7	0.68
30	9 6	5 42 40.45	+22 20 57.6	1.1	9.4	0.74	17	6 4	5 41 31.52	+22 29 27.2	1.0	8.6	0.68
31	9 2	5 42 28.54	22 21 3.8	1.1	9.3	0.74	18	6 0	5 41 41.20	22 29 42.9	1.0	8.6	0.68
eb. 1	8 58	5 42 17.04	22 21 10.1	1.1	9.3	0.74	19	5 56	5 41 51.33	22 29 58.8	1.0	8.6	0.68
2	8 53	5 42 5.97	22 21 16.7	1.1	9.3	0.74	20	5 52	5 42 1.92	22 30 14.7	1.0	8.6	0.68
3	8 49	5 41 55.32	22 21 23.4	1.1	9.3	0.73	21	5 49	5 42 12.97	22 30 30.7	1.0	8.6	0.68
4	8 45	5 41 45.09	+22 21 30.3	1.1	9.3	0.73	22	5 45	5 42 24.46	+22 30 46.8	1.0	8.6	0.68
5	8 41	5 41 35.30	22 21 37.5	1.1	9.3	0.73	23	5 41	5 42 36.39	22 31 3.0	1.0	8.5	0.68
6	8 37	5 41 25.96	22 21 44.8	1.1	9.3	0.73	24	5 38	5 42 48.76	22 31 19.3	1.0	8.5	0.67
7	8 33	5 41 17.06	22 21 52.4	1.1	9.2	0.73	25	5 34	5 43 1.57	22 31 35.6	1.0	8.5	0.67
8	8 29	5 41 8.61	22 22 0.2	1.0	9.2	0.73	26	5 30	5 43 14.80	22 31 52.0	1.0	8.5	0.67
9	8 25	5 41 0.61	+22 22 8.2	1.0	9.2	0.73	27	5 26	5 43 28.46	+22 32 8.4	1.0	8.5	0.67
10	8 21	5 40 53.08	22 22 16.4	1.0	9.2	0.73	28	5 23	5 43 42.54	22 32 24.9	1.0	8.5	0.67
11	8 17	5 40 46.01	22 22 24.9	1.0	9.2	0.73	29	5 19	5 43 57.05	22 32 41.4	1.0	8.5	0.67
12	8 13	5 40 39.40	22 22 33.6	1.0	9.2	0.72	30	5 15	5 44 11.97	22 32 57.9	1.0	8.4	0.67
13	8 9	5 40 33.27	22 22 42.6	1.0	9.2	0.72	31	5 12	5 44 27.30	22 33 14.4	1.0	8.4	0.67
14	8 5	5 40 27.61	+22 22 51.8	1.0	9.1	0.72	Apr. 1	5 8	5 44 43.03	+22 33 30.9	1.0	8.4	0.66
15	8 1	5 40 22.43	+22 23 1.2	1.0	9.1	0.72	2	5 4	5 44 59.17	+22 33 47.4	1.0	8.4	0.66

Stellar magnitude at opposition, in January, 1916, —0.2.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	18 28	7 8 20.72	+21 56 35.5	1.0	8.5	0.67	Nov. 16	15 29	7 9 58.42	+21 55 38.0	1.0	9.2	0.73
2	18 24	7 8 33.21	21 56 16.9	1.0	8.5	0.67	17	15 25	7 9 49.57	21 55 55.9	1.1	9.3	0.73
3	18 20	7 8 45.27	21 55 58.9	1.0	8.5	0.67	18	15 21	7 9 40.28	21 56 14.6	1.1	9.3	0.73
4	18 17	7 8 56.90	21 55 41.6	1.0	8.6	0.67	19	15 16	7 9 30.55	21 56 34.0	1.1	9.3	0.73
5	18 13	7 9 8.09	21 55 25.0	1.0	8.6	0.68	20	15 12	7 9 20.39	21 56 54.2	1.1	9.3	0.73
6	18 9	7 9 18.83	+21 55 9.0	1.0	8.6	0.68	21	15 8	7 9 9.81	+21 57 15.1	1.1	9.3	0.73
7	18 5	7 9 29.13	21 54 53.8	1.0	8.6	0.68	22	15 4	7 8 58.81	21 57 36.7	1.1	9.3	0.73
8	18 2	7 9 38.99	21 54 39.3	1.0	8.6	0.68	23	15 0	7 8 47.39	21 57 59.0	1.1	9.3	0.74
9	17 58	7 9 48.39	21 54 25.5	1.0	8.6	0.68	24	14 56	7 8 35.56	21 58 22.0	1.1	9.4	0.74
10	17 54	7 9 57.34	21 54 12.4	1.0	8.7	0.68	25	14 52	7 8 23.32	21 58 45.6	1.1	9.4	0.74
11	17 50	7 10 5.83	+21 54 0.1	1.0	8.7	0.68	26	14 48	7 8 10.69	+21 59 9.9	1.1	9.4	0.74
12	17 47	7 10 13.87	21 53 48.5	1.0	8.7	0.68	27	14 43	7 7 57.66	21 59 34.8	1.1	9.4	0.74
13	17 43	7 10 21.45	21 53 37.7	1.0	8.7	0.68	28	14 39	7 7 44.24	22 0 0.3	1.1	9.4	0.74
14	17 39	7 10 28.56	21 53 27.7	1.0	8.7	0.69	29	14 35	7 7 30.44	22 0 26.5	1.1	9.4	0.74
15	17 35	7 10 35.21	21 53 18.5	1.0	8.7	0.69	30	14 31	7 7 16.26	22 0 53.3	1.1	9.4	0.74
16	17 31	7 10 41.40	+21 53 10.0	1.0	8.8	0.69	Dec. 1	14 27	7 7 1.72	+22 1 20.7	1.1	9.4	0.74
17	17 27	7 10 47.13	21 53 2.3	1.0	8.8	0.69	2	14 23	7 6 46.81	22 1 48.6	1.1	9.4	0.74
18	17 24	7 10 52.38	21 52 55.4	1.0	8.8	0.69	3	14 18	7 6 31.55	22 2 17.1	1.1	9.5	0.75
19	17 20	7 10 57.17	21 52 49.3	1.0	8.8	0.69	4	14 14	7 6 15.94	22 2 46.1	1.1	9.5	0.75
20	17 16	7 11 1.49	21 52 44.0	1.0	8.8	0.69	5	14 10	7 6 0.00	22 3 15.6	1.1	9.5	0.75
21	17 12	7 11 5.33	+21 52 39.6	1.0	8.8	0.70	6	14 6	7 5 43.73	+22 3 45.6	1.1	9.5	0.75
22	17 8	7 11 8.71	21 52 36.0	1.0	8.8	0.70	7	14 2	7 5 27.13	22 4 16.1	1.1	9.5	0.75
23	17 4	7 11 11.61	21 52 33.2	1.0	8.9	0.70	8	13 57	7 5 10.23	22 4 47.1	1.1	9.5	0.75
24	17 0	7 11 14.03	21 52 31.2	1.0	8.9	0.70	9	13 53	7 4 53.03	22 5 18.4	1.1	9.5	0.75
25	16 57	7 11 15.98	21 52 30.0	1.0	8.9	0.70	10	13 49	7 4 35.53	22 5 50.2	1.1	9.5	0.75
26	16 53	7 11 17.46	+21 52 29.7	1.0	8.9	0.70	11	13 45	7 4 17.76	+22 6 22.4	1.1	9.5	0.75
27	16 49	7 11 18.45	21 52 30.2	1.0	8.9	0.70	12	13 40	7 3 59.72	22 6 54.9	1.1	9.5	0.75
28	16 45	7 11 18.97	21 52 31.6	1.0	8.9	0.70	13	13 36	7 3 41.41	22 7 27.7	1.1	9.6	0.75
29	16 41	7 11 19.01	21 52 33.8	1.0	9.0	0.71	14	13 32	7 3 22.86	22 8 0.9	1.1	9.6	0.75
30	16 37	7 11 18.57	21 52 36.8	1.0	9.0	0.71	15	13 28	7 3 4.07	22 8 34.3	1.1	9.6	0.75
31	16 33	7 11 17.65	+21 52 40.7	1.0	9.0	0.71	16	13 24	7 2 45.05	+22 9 8.0	1.1	9.6	0.75
Nov. 1	16 29	7 11 16.25	21 52 45.5	1.0	9.0	0.71	17	13 19	7 2 25.81	22 9 42.0	1.1	9.6	0.76
2	16 25	7 11 14.37	21 52 51.1	1.0	9.0	0.71	18	13 15	7 2 6.36	22 10 16.3	1.1	9.6	0.76
3	16 21	7 11 12.00	21 52 57.6	1.0	9.0	0.71	19	13 11	7 1 46.72	22 10 50.7	1.1	9.6	0.76
4	16 17	7 11 9.16	21 53 4.9	1.0	9.1	0.71	20	13 6	7 1 26.89	22 11 25.3	1.1	9.6	0.76
5	16 13	7 11 5.84	+21 53 13.1	1.0	9.1	0.71	21	13 2	7 1 6.88	+22 12 0.1	1.1	9.6	0.76
6	16 9	7 11 2.05	21 53 22.2	1.0	9.1	0.72	22	12 58	7 0 46.71	22 12 35.1	1.1	9.6	0.76
7	16 5	7 10 57.78	21 53 32.1	1.0	9.1	0.72	23	12 54	7 0 26.39	22 13 10.2	1.1	9.6	0.76
8	16 1	7 10 53.03	21 53 42.8	1.0	9.1	0.72	24	12 49	7 0 5.92	22 13 45.4	1.1	9.6	0.76
9	15 57	7 10 47.82	21 53 54.3	1.0	9.1	0.72	25	12 45	6 59 45.32	22 14 20.7	1.1	9.6	0.76
10	15 53	7 10 42.15	+21 54 6.7	1.0	9.2	0.72	26	12 41	6 59 24.60	+22 14 56.1	1.1	9.6	0.76
11	15 49	7 10 36.00	21 54 19.9	1.0	9.2	0.72	27	12 37	6 59 3.77	22 15 31.6	1.1	9.6	0.76
12	15 45	7 10 29.39	21 54 33.9	1.0	9.2	0.72	28	12 32	6 58 42.84	22 16 7.1	1.1	9.6	0.76
13	15 41	7 10 22.33	21 54 48.8	1.0	9.2	0.72	29	12 28	6 58 21.84	22 16 42.6	1.1	9.6	0.76
14	15 37	7 10 14.81	21 55 4.4	1.0	9.2	0.73	30	12 24	6 58 0.76	22 17 18.1	1.1	9.6	0.76
15	15 33	7 10 6.84	+21 55 20.8	1.0	9.2	0.73	31	12 19	6 57 39.61	+22 17 53.6	1.1	9.6	0.76
16	15 20	7 9 58.42	+21 55 38.0	1.0	9.2	0.73	32	12 15	6 57 18.41	+22 18 29.1	1.1	9.6	0.76

Stellar magnitude at opposition, in January, 1916, —0.2.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
May 12	17 53	21 13 15.20	−16 47 34.2	0.4	1.7	0.12
13	17 49	21 13 16.73	16 47 29.7	0.4	1.7	0.12
14	17 45	21 13 18.06	16 47 26.2	0.4	1.7	0.12
15	17 41	21 13 19.19	16 47 23.6	0.4	1.7	0.12
16	17 37	21 13 20.13	16 47 21.8	0.4	1.7	0.12
17	17 33	21 13 20.87	−16 47 21.0	0.4	1.7	0.12
18	17 29	21 13 21.41	16 47 20.9	0.4	1.7	0.12
19	17 25	21 13 21.76	16 47 21.7	0.4	1.7	0.12
20	17 21	21 13 21.91	16 47 23.4	0.4	1.7	0.12
21	17 17	21 13 21.87	16 47 26.0	0.4	1.7	0.12
22	17 14	21 13 21.63	−16 47 29.4	0.4	1.7	0.12
23	17 10	21 13 21.19	16 47 33.7	0.4	1.7	0.12
24	17 6	21 13 20.56	16 47 38.9	0.4	1.7	0.12
25	17 2	21 13 19.74	16 47 44.9	0.5	1.7	0.12
26	16 58	21 13 18.73	16 47 51.8	0.5	1.7	0.12
27	16 54	21 13 17.53	−16 47 59.5	0.5	1.7	0.12
28	16 50	21 13 16.14	16 48 8.1	0.5	1.7	0.12
29	16 46	21 13 14.56	16 48 17.5	0.5	1.7	0.12
30	16 42	21 13 12.79	16 48 27.7	0.5	1.7	0.12
31	16 38	21 13 10.83	16 48 38.7	0.5	1.7	0.12
June 1	16 34	21 13 8.69	−16 48 50.6	0.5	1.7	0.12
2	16 30	21 13 6.36	16 49 3.3	0.5	1.7	0.12
3	16 26	21 13 3.85	16 49 16.8	0.5	1.7	0.12
4	16 22	21 13 1.15	16 49 31.1	0.5	1.7	0.12
5	16 18	21 12 58.27	16 49 46.2	0.5	1.7	0.12
6	16 14	21 12 55.21	−16 50 2.1	0.5	1.7	0.12
7	16 10	21 12 51.96	16 50 18.8	0.5	1.7	0.12
8	16 6	21 12 48.53	16 50 36.3	0.5	1.7	0.12
9	16 2	21 12 44.92	16 50 54.5	0.5	1.7	0.12
10	15 58	21 12 41.14	16 51 13.5	0.5	1.7	0.12
11	15 54	21 12 37.18	−16 51 33.3	0.5	1.7	0.12
12	15 50	21 12 33.05	16 51 53.8	0.5	1.7	0.12
13	15 46	21 12 28.74	16 52 15.1	0.5	1.7	0.12
14	15 42	21 12 24.27	16 52 37.1	0.5	1.7	0.12
15	15 38	21 12 19.63	16 52 59.9	0.5	1.7	0.12
16	15 34	21 12 14.82	−16 53 23.3	0.5	1.7	0.12
17	15 30	21 12 9.85	16 53 47.4	0.5	1.7	0.12
18	15 26	21 12 4.72	16 54 12.2	0.5	1.7	0.12
19	15 22	21 11 59.43	16 54 37.7	0.5	1.7	0.12
20	15 18	21 11 53.98	16 55 3.8	0.5	1.7	0.12
21	15 14	21 11 48.38	−16 55 30.6	0.5	1.7	0.12
22	15 10	21 11 42.62	16 55 58.0	0.5	1.7	0.12
23	15 6	21 11 36.71	16 56 26.1	0.5	1.7	0.12
24	15 2	21 11 30.65	16 56 54.8	0.5	1.7	0.12
25	14 58	21 11 24.45	16 57 24.1	0.5	1.7	0.12
26	14 54	21 11 18.11	−16 57 54.0	0.5	1.8	0.12
27	14 50	21 11 11.62	−16 58 24.5	0.5	1.8	0.12
June 27	14 50	21 11 11.62	−16 58 24.5	0.5	1.8	0.12
28	14 46	21 11 4.99	16 58 55.6	0.5	1.8	0.12
29	14 42	21 10 58.23	16 59 27.2	0.5	1.8	0.12
30	14 38	21 10 51.33	16 59 59.4	0.5	1.8	0.12
July 1	14 34	21 10 44.31	17 0 32.1	0.5	1.8	0.12
2	14 30	21 10 37.15	−17 1 5.4	0.5	1.8	0.12
3	14 25	21 10 29.87	17 1 39.1	0.5	1.8	0.12
4	14 21	21 10 22.47	17 2 13.3	0.5	1.8	0.12
5	14 17	21 10 14.94	17 2 48.0	0.5	1.8	0.12
6	14 13	21 10 7.30	17 3 23.2	0.5	1.8	0.12
7	14 9	21 9 59.54	−17 3 58.8	0.5	1.8	0.12
8	14 5	21 9 51.67	17 4 34.8	0.5	1.8	0.12
9	14 1	21 9 43.70	17 5 11.2	0.5	1.8	0.12
10	13 57	21 9 35.62	17 5 48.1	0.5	1.8	0.12
11	13 53	21 9 27.43	17 6 25.4	0.5	1.8	0.12
12	13 49	21 9 19.15	−17 7 3.0	0.5	1.8	0.12
13	13 45	21 9 10.77	17 7 41.0	0.5	1.8	0.12
14	13 41	21 9 2.30	17 8 19.3	0.5	1.8	0.12
15	13 37	21 8 53.74	17 8 58.0	0.5	1.8	0.12
16	13 33	21 8 45.10	17 9 37.0	0.5	1.8	0.12
17	13 29	21 8 36.38	−17 10 16.2	0.5	1.8	0.12
18	13 25	21 8 27.58	17 10 55.7	0.5	1.8	0.12
19	13 20	21 8 18.71	17 11 35.5	0.5	1.8	0.12
20	13 16	21 8 9.76	17 12 15.5	0.5	1.8	0.12
21	13 12	21 8 0.75	17 12 55.7	0.5	1.8	0.12
22	13 8	21 7 51.68	−17 13 36.1	0.5	1.8	0.12
23	13 4	21 7 42.55	17 14 16.8	0.5	1.8	0.12
24	13 0	21 7 33.37	17 14 57.6	0.5	1.8	0.12
25	12 56	21 7 24.13	17 15 38.6	0.5	1.8	0.12
26	12 52	21 7 14.84	17 16 19.7	0.5	1.8	0.12
27	12 48	21 7 5.51	−17 17 0.9	0.5	1.8	0.12
28	12 44	21 6 56.14	17 17 42.2	0.5	1.8	0.12
29	12 40	21 6 46.73	17 18 23.6	0.5	1.8	0.12
30	12 35	21 6 37.29	17 19 5.1	0.5	1.8	0.12
31	12 31	21 6 27.82	17 19 46.7	0.5	1.8	0.12
Aug. 1	12 27	21 6 18.32	−17 20 28.3	0.5	1.8	0.12
2	12 23	21 6 8.79	17 21 9.9	0.5	1.8	0.12
3	12 19	21 5 59.24	17 21 51.5	0.5	1.8	0.12
4	12 15	21 5 49.68	17 22 33.1	0.5	1.8	0.12
5	12 11	21 5 40.12	17 23 14.7	0.5	1.8	0.12
6	12 7	21 5 30.54	−17 23 56.3	0.5	1.8	0.12
7	12 3	21 5 20.96	17 24 37.8	0.5	1.8	0.12
8	11 59	21 5 11.38	17 25 19.2	0.5	1.8	0.12
9	11 55	21 5 1.81	17 26 0.5	0.5	1.8	0.12
10	11 51	21 4 52.25	17 26 41.8	0.5	1.8	0.12
11	11 46	21 4 42.70	−17 27 22.9	0.5	1.8	0.12
12	11 42	21 4 33.17	−17 28 3.9	0.5	1.8	0.12

Stellar magnitude at opposition, in August, 1915, 6.0.

URANUS, 1915.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Aug. 12	11 42	21 4 33.17	−17 28 3.9	0.5	1.8	0.12	Sept. 27	8 35	20 58 37.75	−17 52 26.6	0.5	1.7	0.12
13	11 38	21 4 23.66	17 28 44.7	0.5	1.8	0.12	28	8 31	20 58 33.07	17 52 44.5	0.5	1.7	0.12
14	11 34	21 4 14.18	17 29 25.3	0.5	1.8	0.12	29	8 27	20 58 28.56	17 53 1.7	0.5	1.7	0.12
15	11 30	21 4 4.73	17 30 5.7	0.5	1.8	0.12	30	8 23	20 58 24.23	17 53 18.1	0.5	1.7	0.12
16	11 26	21 3 55.31	17 30 45.8	0.5	1.8	0.12	Oct. 1	8 19	20 58 20.07	17 53 33.7	0.5	1.7	0.12
17	11 22	21 3 45.93	−17 31 25.6	0.5	1.8	0.12	2	8 15	20 58 16.10	−17 53 48.6	0.5	1.7	0.12
18	11 18	21 3 36.58	17 32 5.3	0.5	1.8	0.12	3	8 11	20 58 12.30	17 54 2.7	0.5	1.7	0.12
19	11 14	21 3 27.28	17 32 44.8	0.5	1.8	0.12	4	8 7	20 58 8.69	17 54 16.0	0.5	1.7	0.12
20	11 10	21 3 18.03	17 33 23.9	0.5	1.8	0.12	5	8 3	20 58 5.26	17 54 28.5	0.5	1.7	0.12
21	11 6	21 3 8.84	17 34 2.7	0.5	1.8	0.12	6	7 59	20 58 2.02	17 54 40.2	0.5	1.7	0.12
22	11 1	21 2 59.70	−17 34 41.2	0.5	1.8	0.12	7	7 56	20 57 58.97	−17 54 51.2	0.5	1.7	0.12
23	10 57	21 2 50.62	17 35 19.4	0.5	1.8	0.12	8	7 52	20 57 56.12	17 55 1.3	0.5	1.7	0.12
24	10 53	21 2 41.61	17 35 57.3	0.5	1.8	0.12	9	7 48	20 57 53.45	17 55 10.6	0.5	1.7	0.12
25	10 49	21 2 32.67	17 36 34.8	0.5	1.8	0.12	10	7 44	20 57 50.97	17 55 19.1	0.5	1.7	0.12
26	10 45	21 2 23.79	17 37 12.0	0.5	1.8	0.12	11	7 40	20 57 48.69	17 55 26.8	0.5	1.7	0.12
27	10 41	21 2 14.99	−17 37 48.7	0.5	1.8	0.12	12	7 36	20 57 46.60	−17 55 33.6	0.5	1.7	0.12
28	10 37	21 2 6.26	17 38 25.1	0.5	1.8	0.12	13	7 32	20 57 44.71	17 55 39.6	0.5	1.7	0.12
29	10 33	21 1 57.61	17 39 1.1	0.5	1.8	0.12	14	7 28	20 57 43.01	17 55 44.8	0.5	1.7	0.12
30	10 29	21 1 49.05	17 39 36.6	0.5	1.8	0.12	15	7 24	20 57 41.52	17 55 49.1	0.5	1.7	0.12
31	10 25	21 1 40.58	17 40 11.7	0.5	1.8	0.12	16	7 20	20 57 40.23	17 55 52.6	0.4	1.7	0.12
Sept. 1	10 21	21 1 32.21	−17 40 46.3	0.5	1.8	0.12	17	7 16	20 57 39.14	−17 55 55.2	0.4	1.7	0.12
2	10 17	21 1 23.93	17 41 20.5	0.5	1.8	0.12	18	7 12	20 57 38.25	17 55 57.0	0.4	1.7	0.12
3	10 13	21 1 15.75	17 41 54.2	0.5	1.8	0.12	19	7 8	20 57 37.56	17 55 58.0	0.4	1.7	0.12
4	10 9	21 1 7.67	17 42 27.4	0.5	1.8	0.12	20	7 5	20 57 37.07	17 55 58.1	0.4	1.7	0.12
5	10 4	21 0 59.70	17 43 0.1	0.5	1.8	0.12	21	7 0	20 57 36.79	17 55 57.4	0.4	1.7	0.12
6	10 0	21 0 51.84	−17 43 32.3	0.5	1.8	0.12	22	6 56	20 57 36.71	−17 55 55.8	0.4	1.7	0.12
7	9 56	21 0 44.08	17 44 3.9	0.5	1.8	0.12	23	6 52	20 57 36.83	17 55 53.4	0.4	1.7	0.12
8	9 52	21 0 36.45	17 44 35.0	0.5	1.8	0.12	24	6 48	20 57 37.16	17 55 50.1	0.4	1.7	0.12
9	9 48	21 0 28.94	17 45 5.6	0.5	1.8	0.12	25	6 44	20 57 37.69	17 55 46.0	0.4	1.7	0.12
10	9 44	21 0 21.55	17 45 35.5	0.5	1.8	0.12	26	6 40	20 57 38.42	17 55 41.0	0.4	1.7	0.12
11	9 40	21 0 14.28	−17 46 4.9	0.5	1.8	0.12	27	6 37	20 57 39.36	−17 55 35.2	0.4	1.7	0.12
12	9 36	21 0 7.15	17 46 33.7	0.5	1.8	0.12	28	6 33	20 57 40.50	17 55 28.6	0.4	1.7	0.12
13	9 32	21 0 0.16	17 47 1.9	0.5	1.8	0.12	29	6 29	20 57 41.85	17 55 21.1	0.4	1.7	0.12
14	9 28	20 59 53.30	17 47 29.4	0.5	1.8	0.12	30	6 25	20 57 43.40	17 55 12.7	0.4	1.7	0.12
15	9 24	20 59 46.58	17 47 56.3	0.5	1.8	0.12	31	6 21	20 57 45.16	17 55 3.5	0.4	1.7	0.12
16	9 20	20 59 40.00	−17 48 22.6	0.5	1.8	0.12	Nov. 1	6 17	20 57 47.12	−17 54 53.4	0.4	1.7	0.12
17	9 16	20 59 33.57	17 48 48.2	0.5	1.8	0.12	2	6 13	20 57 49.29	17 54 42.5	0.4	1.7	0.12
18	9 12	20 59 27.28	17 49 13.1	0.5	1.7	0.12	3	6 9	20 57 51.66	17 54 30.7	0.4	1.7	0.12
19	9 8	20 59 21.15	17 49 37.4	0.5	1.7	0.12	4	6 5	20 57 54.23	17 54 18.1	0.4	1.7	0.12
20	9 4	20 59 15.17	17 50 1.0	0.5	1.7	0.12	5	6 1	20 57 57.01	17 54 4.6	0.4	1.7	0.12
21	9 0	20 59 9.35	−17 50 23.9	0.5	1.7	0.12	6	5 58	20 58 0.00	−17 53 50.3	0.4	1.7	0.12
22	8 55	20 59 3.68	17 50 46.1	0.5	1.7	0.12	7	5 54	20 58 3.19	17 53 35.2	0.4	1.7	0.12
23	8 51	20 58 58.17	17 51 7.6	0.5	1.7	0.12	8	5 50	20 58 6.58	17 53 19.2	0.4	1.7	0.12
24	8 47	20 58 52.82	17 51 28.5	0.5	1.7	0.12	9	5 46	20 58 10.18	17 53 2.3	0.4	1.7	0.12
25	8 43	20 58 47.63	17 51 48.6	0.5	1.7	0.12	10	5 42	20 58 13.98	17 52 44.6	0.4	1.7	0.12
26	8 39	20 58 42.61	−17 52 8.0	0.5	1.7	0.12	11	5 38	20 58 17.98	−17 52 26.1	0.4	1.7	0.12
27	8 35	20 58 37.75	−17 52 26.6	0.5	1.7	0.12	12	5 34	20 58 22.18	−17 52 6.7	0.4	1.7	0.12

Stellar magnitude at opposition, in August, 1915, 6.0.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
n. 0	13 27	8 6 40.58	+19 52 42.3	0.3	1.3	0.09	Feb. 15	10 21	8 1 29.37	+20 8 35.9	0.3	1.3	0.09
1	13 23	8 6 34.05	19 53 2.4	0.3	1.3	0.09	16	10 17	8 1 23.37	20 8 54.4	0.3	1.3	0.09
2	13 19	8 6 27.48	19 53 22.6	0.3	1.3	0.09	17	10 13	8 1 17.44	20 9 12.6	0.3	1.3	0.09
3	13 15	8 6 20.85	19 53 42.9	0.3	1.3	0.09	18	10 9	8 1 11.59	20 9 30.6	0.3	1.3	0.09
4	13 11	8 6 14.18	19 54 3.4	0.3	1.3	0.09	19	10 5	8 1 5.82	20 9 48.4	0.3	1.3	0.09
5	13 7	8 6 7.47	+19 54 24.0	0.3	1.3	0.09	20	10 1	8 1 0.13	+20 10 5.9	0.3	1.3	0.09
6	13 3	8 6 0.71	19 54 44.8	0.3	1.3	0.09	21	9 57	8 0 54.53	20 10 23.1	0.3	1.3	0.09
7	12 59	8 5 53.91	19 55 5.7	0.3	1.3	0.09	22	9 53	8 0 49.02	20 10 40.1	0.3	1.3	0.09
8	12 55	8 5 47.07	19 55 26.7	0.3	1.3	0.09	23	9 49	8 0 43.59	20 10 56.8	0.3	1.3	0.09
9	12 51	8 5 40.20	19 55 47.8	0.3	1.3	0.09	24	9 45	8 0 38.25	20 11 13.3	0.3	1.3	0.09
10	12 47	8 5 33.30	+19 56 8.9	0.3	1.3	0.09	25	9 41	8 0 33.01	+20 11 29.6	0.3	1.3	0.09
11	12 43	8 5 26.37	19 56 30.2	0.3	1.3	0.09	26	9 37	8 0 27.86	20 11 45.6	0.3	1.3	0.09
12	12 39	8 5 19.42	19 56 51.5	0.3	1.3	0.09	27	9 33	8 0 22.81	20 12 1.3	0.3	1.3	0.09
13	12 35	8 5 12.45	19 57 12.9	0.3	1.3	0.09	28	9 29	8 0 17.86	20 12 16.7	0.3	1.3	0.09
14	12 31	8 5 5.46	19 57 34.3	0.3	1.3	0.09	Mar. 1	9 25	8 0 13.00	20 12 31.8	0.3	1.3	0.09
15	12 27	8 4 58.45	+19 57 55.8	0.3	1.3	0.09	2	9 21	8 0 8.25	+20 12 46.6	0.3	1.3	0.09
16	12 23	8 4 51.44	19 58 17.3	0.3	1.3	0.09	3	9 17	8 0 3.60	20 13 1.2	0.3	1.3	0.09
17	12 18	8 4 44.41	19 58 38.8	0.3	1.3	0.09	4	9 13	7 59 59.05	20 13 15.4	0.3	1.3	0.09
18	12 14	8 4 37.38	19 59 0.4	0.3	1.3	0.09	5	9 9	7 59 54.61	20 13 29.3	0.3	1.3	0.09
19	12 10	8 4 30.34	19 59 21.9	0.3	1.3	0.09	6	9 5	7 59 50.28	20 13 42.9	0.3	1.3	0.09
20	12 6	8 4 23.30	+19 59 43.5	0.3	1.3	0.09	7	9 1	7 59 46.06	+20 13 56.2	0.3	1.3	0.09
21	12 2	8 4 16.27	20 0 5.1	0.3	1.3	0.09	8	8 57	7 59 41.95	20 14 9.2	0.3	1.3	0.09
22	11 58	8 4 9.24	20 0 26.6	0.3	1.3	0.09	9	8 53	7 59 37.96	20 14 21.8	0.3	1.3	0.09
23	11 54	8 4 2.22	20 0 48.1	0.3	1.3	0.09	10	8 49	7 59 34.09	20 14 34.1	0.3	1.3	0.09
24	11 50	8 3 55.22	20 1 9.5	0.3	1.3	0.09	11	8 45	7 59 30.33	20 14 46.1	0.3	1.3	0.09
25	11 46	8 3 48.23	+20 1 30.9	0.3	1.3	0.09	12	8 41	7 59 26.69	+20 14 57.8	0.3	1.3	0.09
26	11 42	8 3 41.25	20 1 52.2	0.3	1.3	0.09	13	8 37	7 59 23.17	20 15 9.1	0.3	1.3	0.09
27	11 38	8 3 34.29	20 2 13.5	0.3	1.3	0.09	14	8 33	7 59 19.77	20 15 20.1	0.3	1.3	0.09
28	11 34	8 3 27.36	20 2 34.7	0.3	1.3	0.09	15	8 29	7 59 16.49	20 15 30.7	0.3	1.3	0.09
29	11 30	8 3 20.45	20 2 55.8	0.3	1.3	0.09	16	8 25	7 59 13.34	20 15 41.0	0.3	1.3	0.09
30	11 26	8 3 13.56	+20 3 16.9	0.3	1.3	0.09	17	8 21	7 59 10.31	+20 15 50.9	0.3	1.3	0.09
31	11 22	8 3 6.71	20 3 37.8	0.3	1.3	0.09	18	8 17	7 59 7.41	20 16 0.4	0.3	1.3	0.09
eb. 1	11 18	8 2 59.89	20 3 58.7	0.3	1.3	0.09	19	8 13	7 59 4.64	20 16 9.6	0.3	1.3	0.09
2	11 14	8 2 53.11	20 4 19.5	0.3	1.3	0.09	20	8 9	7 59 2.00	20 16 18.4	0.3	1.3	0.09
3	11 10	8 2 46.37	20 4 40.1	0.3	1.3	0.09	21	8 5	7 58 59.49	20 16 26.9	0.3	1.3	0.09
4	11 6	8 2 39.66	+20 5 0.6	0.3	1.3	0.09	22	8 1	7 58 57.12	+20 16 35.0	0.3	1.3	0.09
5	11 2	8 2 33.00	20 5 21.0	0.3	1.3	0.09	23	7 57	7 58 54.87	20 16 42.7	0.3	1.3	0.09
6	10 58	8 2 26.39	20 5 41.2	0.3	1.3	0.09	24	7 53	7 58 52.75	20 16 50.0	0.3	1.3	0.09
7	10 54	8 2 19.82	20 6 1.3	0.3	1.3	0.09	25	7 49	7 58 50.77	20 16 57.0	0.3	1.3	0.09
8	10 50	8 2 13.31	20 6 21.2	0.3	1.3	0.09	26	7 45	7 58 48.92	20 17 3.6	0.3	1.3	0.09
9	10 46	8 2 6.85	+20 6 41.0	0.3	1.3	0.09	27	7 41	7 58 47.21	+20 17 9.8	0.3	1.3	0.09
10	10 41	8 2 0.45	20 7 0.6	0.3	1.3	0.09	28	7 37	7 58 45.63	20 17 15.6	0.3	1.3	0.09
11	10 37	8 1 54.10	20 7 20.0	0.3	1.3	0.09	29	7 33	7 58 44.18	20 17 21.1	0.3	1.3	0.09
12	10 33	8 1 47.82	20 7 39.3	0.3	1.3	0.09	30	7 29	7 58 42.87	20 17 26.2	0.3	1.3	0.09
13	10 29	8 1 41.60	20 7 58.4	0.3	1.3	0.09	31	7 25	7 58 41.70	20 17 30.9	0.3	1.3	0.09
14	10 25	8 1 35.45	+20 8 17.3	0.3	1.3	0.09	Apr. 1	7 21	7 58 40.66	+20 17 35.2	0.3	1.3	0.09
15	10 21	8 1 29.37	+20 8 35.9	0.3	1.3	0.09	2	7 18	7 58 39.76	+20 17 39.1	0.3	1.3	0.09

Stellar magnitude at opposition, in January, *1915*, 7.7.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Apr. 1	7 21	7 58 40.66	+20 17 35.2	0.3	1.3	0.09
2	7 18	7 58 39.76	20 17 39.1	0.3	1.3	0.09
3	7 14	7 58 39.00	20 17 42.6	0.3	1.3	0.09
4	7 10	7 58 38.38	20 17 45.8	0.3	1.3	0.09
5	7 6	7 58 37.89	20 17 48.5	0.3	1.3	0.09
6	7 2	7 58 37.54	+20 17 50.9	0.3	1.3	0.09
7	6 58	7 58 37.33	20 17 52.9	0.3	1.3	0.09
8	6 54	7 58 37.26	20 17 54.5	0.3	1.3	0.09
9	6 50	7 58 37.33	20 17 55.7	0.3	1.3	0.09
10	6 46	7 58 37.54	20 17 56.5	0.3	1.3	0.09
11	6 42	7 58 37.89	+20 17 56.9	0.3	1.3	0.09
12	6 38	7 58 38.38	20 17 56.9	0.3	1.3	0.09
13	6 34	7 58 39.01	20 17 56.5	0.3	1.3	0.09
14	6 30	7 58 39.78	20 17 55.7	0.3	1.3	0.09
15	6 26	7 58 40.68	20 17 54.5	0.3	1.3	0.09
16	6 22	7 58 41.73	+20 17 52.9	0.3	1.3	0.09
17	6 18	7 58 42.92	20 17 50.9	0.3	1.3	0.09
18	6 15	7 58 44.25	20 17 48.5	0.3	1.3	0.09
19	6 11	7 58 45.72	20 17 45.7	0.3	1.3	0.09
20	6 7	7 58 47.32	20 17 42.6	0.3	1.3	0.09
Oct. 21	18 20	8 19 17.01	+19 16 56.0	0.3	1.3	0.09
22	18 16	8 19 18.98	19 16 49.5	0.3	1.3	0.09
23	18 12	8 19 20.81	19 16 43.4	0.3	1.3	0.09
24	18 9	8 19 22.50	19 16 37.8	0.3	1.3	0.09
25	18 5	8 19 24.06	19 16 32.7	0.3	1.3	0.09
26	18 1	8 19 25.47	+19 16 28.0	0.3	1.3	0.09
27	17 57	8 19 26.75	19 16 23.8	0.3	1.3	0.09
28	17 53	8 19 27.88	19 16 20.0	0.3	1.3	0.09
29	17 49	8 19 28.88	19 16 16.7	0.3	1.3	0.09
30	17 45	8 19 29.73	19 16 13.9	0.3	1.3	0.09
31	17 41	8 19 30.45	+19 16 11.5	0.3	1.3	0.09
Nov. 1	17 37	8 19 31.02	19 16 9.6	0.3	1.3	0.09
2	17 33	8 19 31.46	19 16 8.2	0.3	1.3	0.09
3	17 29	8 19 31.76	19 16 7.2	0.3	1.3	0.09
4	17 25	8 19 31.91	19 16 6.7	0.3	1.3	0.09
5	17 21	8 19 31.92	+19 16 6.7	0.3	1.3	0.09
6	17 17	8 19 31.79	19 16 7.1	0.3	1.3	0.09
7	17 13	8 19 31.52	19 16 8.0	0.3	1.3	0.09
8	17 9	8 19 31.11	19 16 9.4	0.3	1.3	0.09
9	17 6	8 19 30.56	19 16 11.2	0.3	1.3	0.09
10	17 2	8 19 29.87	+19 16 13.5	0.3	1.3	0.09
11	16 58	8 19 29.04	19 16 16.3	0.3	1.3	0.09
12	16 54	8 19 28.07	19 16 19.5	0.3	1.3	0.09
13	16 50	8 19 26.96	19 16 23.2	0.3	1.3	0.09
14	16 46	8 19 25.72	19 16 27.3	0.3	1.3	0.09
15	16 42	8 19 24.34	+19 16 31.9	0.3	1.3	0.09
16	16 38	8 19 22.83	+19 16 36.9	0.3	1.3	0.09
Nov. 16	16 38	8 19 22.83	+19 16 36.9	0.3	1.3	0.09
17	16 34	8 19 21.18	19 16 42.4	0.3	1.3	0.09
18	16 30	8 19 19.40	19 16 48.3	0.3	1.3	0.09
19	16 26	8 19 17.48	19 16 54.7	0.3	1.3	0.09
20	16 22	8 19 15.42	19 17 1.6	0.3	1.3	0.09
21	16 18	8 19 13.23	+19 17 8.9	0.3	1.3	0.09
22	16 14	8 19 10.91	19 17 16.6	0.3	1.3	0.09
23	16 10	8 19 8.46	19 17 24.8	0.3	1.3	0.09
24	16 6	8 19 5.88	19 17 33.4	0.3	1.3	0.09
25	16 2	8 19 3.18	19 17 42.4	0.3	1.3	0.09
26	15 58	8 19 0.35	+19 17 51.9	0.3	1.3	0.09
27	15 54	8 18 57.39	19 18 1.8	0.3	1.3	0.09
28	15 50	8 18 54.30	19 18 12.1	0.3	1.3	0.09
29	15 46	8 18 51.09	19 18 22.8	0.3	1.3	0.09
30	15 42	8 18 47.75	19 18 33.9	0.3	1.3	0.09
Dec. 1	15 38	8 18 44.29	+19 18 45.4	0.3	1.3	0.09
2	15 34	8 18 40.71	19 18 57.3	0.3	1.3	0.09
3	15 30	8 18 37.00	19 19 9.6	0.3	1.3	0.09
4	15 26	8 18 33.18	19 19 22.3	0.3	1.3	0.09
5	15 22	8 18 29.24	19 19 35.4	0.3	1.3	0.09
6	15 18	8 18 25.19	+19 19 48.9	0.3	1.3	0.09
7	15 14	8 18 21.03	19 20 2.8	0.3	1.3	0.09
8	15 10	8 18 16.75	19 20 17.0	0.3	1.3	0.09
9	15 6	8 18 12.36	19 20 31.6	0.3	1.3	0.09
10	15 2	8 18 7.86	19 20 46.5	0.3	1.3	0.09
11	14 58	8 18 3.26	+19 21 1.8	0.3	1.3	0.09
12	14 54	8 17 58.55	19 21 17.5	0.3	1.3	0.09
13	14 50	8 17 53.74	19 21 33.5	0.3	1.3	0.09
14	14 46	8 17 48.83	19 21 49.8	0.3	1.3	0.09
15	14 42	8 17 43.82	19 22 6.4	0.3	1.3	0.09
16	14 38	8 17 38.71	+19 22 23.3	0.3	1.3	0.09
17	14 34	8 17 33.51	19 22 40.6	0.3	1.3	0.09
18	14 30	8 17 28.22	19 22 58.2	0.3	1.3	0.09
19	14 26	8 17 22.84	19 23 16.1	0.3	1.3	0.09
20	14 22	8 17 17.37	19 23 34.2	0.3	1.3	0.09
21	14 18	8 17 11.81	+19 23 52.6	0.3	1.3	0.09
22	14 14	8 17 6.17	19 24 11.3	0.3	1.3	0.09
23	14 10	8 17 0.45	19 24 30.3	0.3	1.3	0.09
24	14 6	8 16 54.65	19 24 49.5	0.3	1.3	0.09
25	14 2	8 16 48.77	19 25 8.9	0.3	1.3	0.09
26	13 58	8 16 42.82	+19 25 28.6	0.3	1.3	0.09
27	13 54	8 16 36.80	19 25 48.5	0.3	1.3	0.09
28	13 50	8 16 30.71	19 26 8.6	0.3	1.3	0.09
29	13 46	8 16 24.54	19 26 29.0	0.3	1.3	0.09
30	13 42	8 16 18.30	19 26 49.6	0.3	1.3	0.09
31	13 38	8 16 12.01	+19 27 10.4	0.3	1.3	0.09
32	13 34	8 16 5.67	+19 27 31.3	0.3	1.3	0.09

Stellar magnitude at opposition, in January, 1916, 7.7.

[Eph 15]

PART III.

PHENOMENA.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
July 1	22 39	5 17 26.18	+22 28 13.3	5.5	5.4	0.39
2	22 40	5 22 40.83	22 35 43.4	5.5	5.4	0.39
3	22 42	5 27 56.15	22 42 35.1	5.5	5.3	0.39
4	22 43	5 33 12.10	22 48 48.1	5.5	5.3	0.39
5	22 44	5 38 28.63	22 54 22.1	5.5	5.3	0.39
6	22 46	5 43 45.68	+22 59 16.7	5.5	5.3	0.39
7	22 47	5 49 3.20	23 3 31.5	5.4	5.3	0.38
8	22 48	5 54 21.14	23 7 6.4	5.4	5.3	0.38
9	22 50	5 59 39.45	23 10 1.3	5.4	5.3	0.38
10	22 51	6 4 58.09	23 12 15.8	5.4	5.3	0.38
11	22 52	6 10 16.98	+23 13 49.7	5.4	5.2	0.38
12	22 54	6 15 36.08	23 14 43.0	5.4	5.2	0.38
13	22 55	6 20 55.33	23 14 55.6	5.4	5.2	0.38
14	22 57	6 26 14.68	23 14 27.4	5.4	5.2	0.38
15	22 58	6 31 34.06	23 13 18.3	5.4	5.2	0.38
16	22 59	6 36 53.41	+23 11 28.2	5.4	5.2	0.38
17	23 1	6 42 12.69	23 8 57.2	5.3	5.2	0.38
18	23 2	6 47 31.84	23 5 45.5	5.3	5.2	0.38
19	23 3	6 52 50.81	23 1 53.0	5.3	5.2	0.37
20	23 5	6 58 9.53	22 57 19.7	5.3	5.2	0.37
21	23 6	7 3 27.97	+22 52 5.9	5.3	5.2	0.37
22	23 7	7 8 46.07	22 46 11.7	5.3	5.2	0.37
23	23 9	7 14 3.78	22 39 37.2	5.3	5.1	0.37
24	23 10	7 19 21.06	22 32 22.7	5.3	5.1	0.37
25	23 11	7 24 37.86	22 24 28.4	5.3	5.1	0.37
26	23 13	7 29 54.14	+22 15 54.6	5.3	5.1	0.37
27	23 14	7 35 9.86	22 6 41.5	5.3	5.1	0.37
28	23 15	7 40 24.97	21 56 49.4	5.3	5.1	0.37
29	23 17	7 45 39.43	21 46 18.7	5.2	5.1	0.37
30	23 18	7 50 53.20	21 35 9.7	5.2	5.1	0.36
31	23 19	7 56 6.25	+21 23 22.7	5.2	5.1	0.36
Aug. 1	23 20	8 1 18.53	21 10 58.2	5.2	5.1	0.36
2	23 22	8 6 30.02	20 57 56.7	5.2	5.1	0.36
3	23 23	8 11 40.68	20 44 18.5	5.2	5.1	0.36
4	23 24	8 16 50.48	20 30 4.1	5.2	5.1	0.36
5	23 25	8 21 59.39	+20 15 14.0	5.2	5.0	0.36
6	23 27	8 27 7.39	19 59 48.8	5.2	5.0	0.36
7	23 28	8 32 14.46	19 43 48.9	5.2	5.0	0.36
8	23 29	8 37 20.56	19 27 15.0	5.2	5.0	0.36
9	23 30	8 42 25.68	19 10 7.6	5.2	5.0	0.36
10	23 31	8 47 29.80	+18 52 27.3	5.2	5.0	0.35
11	23 32	8 52 32.90	18 34 14.7	5.2	5.0	0.35
12	23 33	8 57 34.97	18 15 30.4	5.2	5.0	0.35
13	23 34	9 2 36.00	17 56 15.1	5.2	5.0	0.35
14	23 36	9 7 35.98	17 36 29.4	5.1	5.0	0.35
15	23 37	9 12 34.91	+17 16 13.9	5.1	5.0	0.35
16	23 38	9 17 32.79	+16 55 29.3	5.1	5.0	0.35

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Aug. 16	23 38	9 17 32.79	+16 55 29.3	5.1	5.0	0.35
17	23 39	9 22 29.61	16 34 16.2	5.1	5.0	0.35
18	23 40	9 27 25.37	16 12 35.3	5.1	5.0	0.35
19	23 41	9 32 20.08	15 50 27.4	5.1	5.0	0.35
20	23 41	9 37 13.76	15 27 53.0	5.1	5.0	0.34
21	23 42	9 42 6.41	+15 4 52.9	5.1	5.0	0.34
22	23 43	9 46 58.03	14 41 27.6	5.1	5.0	0.34
23	23 44	9 51 48.65	14 17 37.9	5.1	5.0	0.34
24	23 45	9 56 38.29	13 53 24.5	5.1	5.0	0.34
25	23 46	10 1 26.96	13 28 48.1	5.1	5.0	0.34
26	23 47	10 6 14.68	+13 3 49.4	5.1	5.0	0.34
27	23 48	10 11 1.47	12 38 29.1	5.1	5.0	0.34
28	23 49	10 15 47.34	12 12 47.9	5.1	5.0	0.34
29	23 49	10 20 32.33	11 46 46.4	5.1	5.0	0.34
30	23 50	10 25 16.46	11 20 25.3	5.1	5.0	0.34
31	23 51	10 29 59.75	+10 53 45.5	5.1	5.0	0.34
Sept. 1	23 52	10 34 42.24	10 26 47.7	5.1	5.0	0.34
2	23 52	10 39 23.95	9 59 32.6	5.1	5.0	0.34
3	23 53	10 44 4.90	9 32 0.9	5.1	5.0	0.34
4	23 54	10 48 45.13	9 4 13.3	5.1	5.0	0.34
5	23 55	10 53 24.67	+ 8 36 10.6	5.1	5.0	0.34
6	23 55	10 58 3.54	8 7 53.5	5.1	5.0	0.33
7	23 56	11 2 41.79	7 39 22.7	5.1	5.0	0.33
8	23 57	11 7 19.44	7 10 39.1	5.1	5.0	0.33
9	23 57	11 11 56.52	6 41 43.4	5.1	5.0	0.33
10	23 58	11 16 33.06	+ 6 12 36.3	5.1	5.0	0.33
11	23 59	11 21 9.10	5 43 18.5	5.1	5.0	0.33
12	23 59	11 25 44.68	5 13 50.9	5.1	5.0	0.33
14	0 0	11 30 19.84	4 44 14.1	5.1	5.0	0.33
15	0 1	11 34 54.61	4 14 28.9	5.1	5.0	0.33
16	0 1	11 39 29.02	+ 3 44 35.9	5.1	5.0	0.33
17	0 2	11 44 3.13	3 14 36.0	5.1	5.0	0.33
18	0 2	11 48 36.97	2 44 29.8	5.1	5.0	0.33
19	0 3	11 53 10.58	2 14 18.2	5.1	5.0	0.33
20	0 4	11 57 44.00	1 44 1.8	5.1	5.0	0.33
21	0 4	12 2 17.27	+ 1 13 41.3	5.1	5.0	0.33
22	0 5	12 6 50.44	0 43 17.5	5.1	5.0	0.33
23	0 5	12 11 23.56	+ 0 12 51.0	5.1	5.0	0.33
24	0 6	12 15 56.67	− 0 17 37.4	5.1	5.0	0.33
25	0 7	12 20 29.81	0 48 7.0	5.1	5.0	0.33
26	0 7	12 25 3.03	− 1 18 37.0	5.1	5.0	0.33
27	0 8	12 29 36.36	1 49 6.8	5.1	5.0	0.33
28	0 9	12 34 9.85	2 19 35.6	5.1	5.0	0.33
29	0 9	12 38 43.55	2 50 2.6	5.1	5.0	0.33
30	0 10	12 43 17.50	3 20 27.2	5.1	5.0	0.33
Oct. 1	0 10	12 47 51.74	− 3 50 48.5	5.1	5.0	0.33
2	0 11	12 52 26.32	− 4 21 5.8	5.1	5.0	0.33

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
ct. 1	0 10	12 47 51.74	− 3 50 48.5	5.1	5.0	0.33	Nov. 16	0 54	16 33 7.02	−22 24 11.3	5.4	5.3	0.38
2	0 11	12 52 26.32	4 21 5.8	5.1	5.0	0.33	17	0 56	16 38 26.97	22 37 21.4	5.5	5.3	0.38
3	0 12	12 57 1.28	4 51 18.4	5.1	5.0	0.33	18	0 57	16 43 47.88	22 49 51.8	5.5	5.3	0.38
4	0 12	13 1 36.66	5 21 25.5	5.2	5.0	0.34	19	0 58	16 49 9.73	23 1 41.9	5.5	5.3	0.39
5	0 13	13 6 12.50	5 51 26.4	5.2	5.0	0.34	20	1 0	16 54 32.49	23 12 51.3	5.5	5.3	0.39
6	0 14	13 10 48.84	− 6 21 20.2	5.2	5.0	0.34	21	1 1	16 59 56.10	−23 23 19.4	5.5	5.3	0.39
7	0 14	13 15 25.72	6 51 6.2	5.2	5.0	0.34	22	1 3	17 5 20.51	23 33 5.6	5.5	5.3	0.39
8	0 15	13 20 3.18	7 20 43.6	5.2	5.0	0.34	23	1 4	17 10 45.68	23 42 9.6	5.5	5.3	0.39
9	0 16	13 24 41.26	7 50 11.6	5.2	5.0	0.34	24	1 6	17 16 11.55	23 50 30.9	5.5	5.4	0.39
10	0 16	13 29 20.00	8 19 29.5	5.2	5.0	0.34	25	1 7	17 21 38.08	23 58 9.1	5.5	5.4	0.39
11	0 17	13 33 59.43	− 8 48 36.4	5.2	5.0	0.34	26	1 9	17 27 5.21	−24 5 3.8	5.5	5.4	0.39
12	0 18	13 38 39.57	9 17 31.5	5.2	5.0	0.34	27	1 10	17 32 32.89	24 11 14.7	5.6	5.4	0.39
13	0 18	13 43 20.47	9 46 14.1	5.2	5.0	0.34	28	1 12	17 38 1.04	24 16 41.4	5.6	5.4	0.40
14	0 19	13 48 2.17	10 14 43.3	5.2	5.0	0.34	29	1 13	17 43 29.61	24 21 23.7	5.6	5.4	0.40
15	0 20	13 52 44.70	10 42 58.4	5.2	5.0	0.34	30	1 15	17 48 58.55	24 25 21.4	5.6	5.4	0.40
16	0 21	13 57 28.10	−11 10 58.6	5.2	5.1	0.34	Dec. 1	1 16	17 54 27.78	−24 28 34.2	5.6	5.4	0.40
17	0 22	14 2 12.39	11 38 43.2	5.2	5.1	0.34	2	1 18	17 59 57.24	24 31 1.9	5.6	5.5	0.40
18	0 22	14 6 57.60	12 6 11.3	5.2	5.1	0.34	3	1 19	18 5 26.87	24 32 44.5	5.6	5.5	0.40
19	0 23	14 11 43.78	12 33 22.1	5.2	5.1	0.35	4	1 21	18 10 56.59	24 33 41.7	5.7	5.5	0.40
20	0 24	14 16 30.96	13 0 14.9	5.2	5.1	0.35	5	1 23	18 16 26.34	24 33 53.5	5.7	5.5	0.40
21	0 25	14 21 19.16	−13 26 48.8	5.2	5.1	0.35	6	1 24	18 21 56.03	−24 33 19.8	5.7	5.5	0.40
22	0 26	14 26 8.40	13 53 3.2	5.2	5.1	0.35	7	1 26	18 27 25.61	24 32 0.7	5.7	5.5	0.41
23	0 27	14 30 58.73	14 18 57.2	5.2	5.1	0.35	8	1 27	18 32 55.00	24 29 56.3	5.7	5.5	0.41
24	0 28	14 35 50.17	14 44 29.9	5.3	5.1	0.35	9	1 29	18 38 24.12	24 27 6.5	5.7	5.5	0.41
25	0 29	14 40 42.75	15 9 40.5	5.3	5.1	0.35	10	1 30	18 43 52.91	24 23 31.6	5.7	5.5	0.41
26	0 30	14 45 36.47	−15 34 28.4	5.3	5.1	0.35	11	1 32	18 49 21.30	−24 19 11.7	5.7	5.6	0.41
27	0 31	14 50 31.38	15 58 52.7	5.3	5.1	0.36	12	1 33	18 54 49.22	24 14 7.1	5.8	5.6	0.41
28	0 32	14 55 27.48	16 22 52.6	5.3	5.1	0.36	13	1 35	19 0 16.60	24 8 17.8	5.8	5.6	0.41
29	0 33	15 0 24.79	16 46 27.3	5.3	5.1	0.36	14	1 36	19 5 43.37	24 1 44.1	5.8	5.6	0.41
30	0 34	15 5 23.32	17 9 36.1	5.3	5.1	0.36	15	1 38	19 11 9.47	23 54 26.4	5.8	5.6	0.41
31	0 35	15 10 23.10	−17 32 18.1	5.3	5.1	0.36	16	1 39	19 16 34.86	−23 46 25.0	5.8	5.6	0.41
Nov. 1	0 36	15 15 24.13	17 54 32.5	5.3	5.1	0.36	17	1 41	19 21 59.48	23 37 40.4	5.8	5.7	0.41
2	0 37	15 20 26.41	18 16 18.5	5.3	5.2	0.36	18	1 42	19 27 23.25	23 28 12.8	5.8	5.7	0.42
3	0 38	15 25 29.94	18 37 35.2	5.3	5.2	0.36	19	1 44	19 32 46.13	23 18 2.6	5.9	5.7	0.42
4	0 39	15 30 34.74	18 58 22.0	5.3	5.2	0.37	20	1 45	19 38 8.07	23 7 10.2	5.9	5.7	0.42
5	0 40	15 35 40.81	−19 18 38.1	5.3	5.2	0.37	21	1 46	19 43 29.02	−22 55 36.2	5.9	5.7	0.42
6	0 41	15 40 48.13	19 38 22.6	5.3	5.2	0.37	22	1 48	19 48 48.95	22 43 21.1	5.9	5.7	0.42
7	0 43	15 45 56.70	19 57 34.8	5.4	5.2	0.37	23	1 49	19 54 7.80	22 30 25.3	5.9	5.8	0.42
8	0 44	15 51 6.50	20 16 13.9	5.4	5.2	0.37	24	1 51	19 59 25.53	22 16 49.4	5.9	5.8	0.42
9	0 45	15 56 17.51	20 34 19.2	5.4	5.2	0.37	25	1 52	20 4 42.11	22 2 33.9	6.0	5.8	0.42
10	0 46	16 1 29.73	−20 51 50.1	5.4	5.2	0.37	26	1 53	20 9 57.51	−21 47 39.5	6.0	5.8	0.42
11	0 47	16 6 43.14	21 8 45.7	5.4	5.2	0.38	27	1 54	20 15 11.69	21 32 6.7	6.0	5.8	0.42
12	0 49	16 11 57.70	21 25 5.4	5.4	5.2	0.38	28	1 56	20 20 24.63	21 15 56.1	6.0	5.9	0.42
13	0 50	16 17 13.39	21 40 48.4	5.4	5.3	0.38	29	1 57	20 25 36.30	20 59 8.4	6.0	5.9	0.42
14	0 51	16 22 30.19	21 55 54.2	5.4	5.3	0.38	30	1 58	20 30 46.68	20 41 44.3	6.1	5.9	0.42
15	0 53	16 27 48.08	−22 10 22.0	5.4	5.3	0.38	31	1 59	20 35 55.74	−20 23 44.4	6.1	5.9	0.42
16	0 54	16 33 7.02	−22 24 11.3	5.4	5.3	0.38	32	2 1	20 41 3.47	−20 5 9.3	6.1	5.9	0.42

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	19 16	7 56 58.47	+21 41 13.5	5.7	3.2	0.24	Nov. 16	17 49	9 31 5.97	+16 48 0.6	7.4	4.3	0.30
2	19 15	7 59 22.58	21 35 41.5	5.7	3.3	0.24	17	17 47	9 32 41.94	16 42 4.2	7.5	4.3	0.30
3	19 13	8 1 45.88	21 30 4.4	5.7	3.3	0.24	18	17 45	9 34 16.52	16 36 12.7	7.5	4.3	0.30
4	19 12	8 4 8.38	21 24 22.3	5.8	3.3	0.24	19	17 42	9 35 49.67	16 30 26.4	7.6	4.3	0.30
5	19 10	8 6 30.07	21 18 35.4	5.8	3.4	0.24	20	17 40	9 37 21.39	16 24 45.5	7.6	4.4	0.31
6	19 9	8 8 50.91	+21 12 44.0	5.8	3.4	0.24	21	17 37	9 38 51.64	+16 19 10.2	7.7	4.4	0.31
7	19 7	8 11 10.90	21 6 48.2	5.9	3.4	0.24	22	17 35	9 40 20.41	16 13 40.8	7.7	4.4	0.31
8	19 5	8 13 30.04	21 0 48.2	5.9	3.5	0.24	23	17 33	9 41 47.66	16 8 17.7	7.8	4.5	0.31
9	19 4	8 15 48.32	20 54 44.1	5.9	3.5	0.24	24	17 30	9 43 13.37	16 3 1.2	7.8	4.5	0.31
10	19 2	8 18 5.71	20 48 36.2	6.0	3.5	0.24	25	17 27	9 44 37.52	15 57 51.6	7.9	4.5	0.32
11	19 0	8 20 22.23	+20 42 24.8	6.0	3.5	0.24	26	17 25	9 46 0.06	+15 52 49.2	8.0	4.6	0.32
12	18 59	8 22 37.86	20 36 10.0	6.0	3.5	0.24	27	17 22	9 47 20.97	15 47 54.2	8.0	4.6	0.32
13	18 57	8 24 52.58	20 29 51.8	6.0	3.5	0.24	28	17 20	9 48 40.23	15 43 6.9	8.1	4.7	0.32
14	18 55	8 27 6.40	20 23 30.6	6.1	3.5	0.24	29	17 17	9 49 57.80	15 38 27.6	8.1	4.7	0.33
15	18 54	8 29 19.32	20 17 6.7	6.1	3.5	0.25	30	17 14	9 51 13.64	15 33 56.7	8.2	4.7	0.33
16	18 52	8 31 31.32	+20 10 40.0	6.1	3.5	0.25	Dec. 1	17 12	9 52 27.71	+15 29 34.6	8.3	4.8	0.33
17	18 50	8 33 42.39	20 4 10.7	6.2	3.5	0.25	2	17 9	9 53 39.97	15 25 21.5	8.3	4.8	0.33
18	18 48	8 35 52.53	19 57 39.2	6.2	3.5	0.25	3	17 6	9 54 50.40	15 21 17.9	8.4	4.9	0.33
19	18 47	8 38 1.73	19 51 5.5	6.2	3.6	0.26	4	17 3	9 55 58.95	15 17 24.0	8.5	4.9	0.34
20	18 45	8 40 9.98	19 44 29.9	6.3	3.6	0.26	5	17 1	9 57 5.59	15 13 40.1	8.6	4.9	0.34
21	18 43	8 42 17.27	+19 37 52.6	6.3	3.6	0.26	6	16 58	9 58 10.28	+15 10 6.5	8.6	5.0	0.34
22	18 41	8 44 23.59	19 31 13.8	6.4	3.6	0.26	7	16 55	9 59 13.00	15 6 43.5	8.7	5.0	0.34
23	18 39	8 46 28.94	19 24 33.7	6.4	3.6	0.26	8	16 52	10 0 13.70	15 3 31.3	8.8	5.1	0.35
24	18 37	8 48 33.31	19 17 52.4	6.5	3.7	0.26	9	16 49	10 1 12.34	15 0 30.2	8.9	5.1	0.35
25	18 35	8 50 36.67	19 11 10.2	6.5	3.7	0.26	10	16 46	10 2 8.90	14 57 40.6	8.9	5.1	0.35
26	18 34	8 52 39.02	+19 4 27.3	6.6	3.7	0.26	11	16 43	10 3 3.35	+14 55 2.6	9.0	5.2	0.35
27	18 32	8 54 40.34	18 57 44.0	6.6	3.8	0.26	12	16 40	10 3 55.65	14 52 36.6	9.0	5.2	0.35
28	18 30	8 56 40.62	18 51 0.6	6.6	3.8	0.26	13	16 37	10 4 45.77	14 50 22.7	9.1	5.3	0.36
29	18 28	8 58 39.85	18 44 17.2	6.7	3.8	0.27	14	16 34	10 5 33.66	14 48 21.3	9.2	5.3	0.36
30	18 26	9 0 38.01	18 37 34.0	6.7	3.8	0.27	15	16 30	10 6 19.29	14 46 32.5	9.3	5.3	0.36
31	18 24	9 2 35.06	+18 30 51.3	6.7	3.8	0.27	16	16 27	10 7 2.62	+14 44 56.7	9.4	5.4	0.37
Nov. 1	18 22	9 4 31.02	18 24 9.4	6.8	3.9	0.27	17	16 24	10 7 43.62	14 43 34.1	9.4	5.4	0.37
2	18 20	9 6 25.86	18 17 28.5	6.8	3.9	0.27	18	16 21	10 8 22.24	14 42 25.2	9.5	5.5	0.37
3	18 18	9 8 19.55	18 10 48.9	6.8	3.9	0.27	19	16 17	10 8 58.44	14 41 30.2	9.6	5.5	0.38
4	18 16	9 10 12.08	18 4 10.7	6.9	3.9	0.28	20	16 14	10 9 32.17	14 40 49.1	9.7	5.6	0.38
5	18 14	9 12 3.44	+17 57 34.3	6.9	4.0	0.28	21	16 11	10 10 3.40	+14 40 22.4	9.8	5.6	0.39
6	18 12	9 13 53.61	17 51 0.0	7.0	4.0	0.28	22	16 7	10 10 32.08	14 40 10.3	9.8	5.6	0.39
7	18 10	9 15 42.56	17 44 28.0	7.0	4.0	0.28	23	16 4	10 10 58.15	14 40 13.1	9.9	5.7	0.39
8	18 7	9 17 30.29	17 37 58.5	7.1	4.0	0.28	24	16 0	10 11 21.58	14 40 31.0	10.0	5.8	0.39
9	18 5	9 19 16.77	17 31 31.8	7.1	4.0	0.28	25	15 57	10 11 42.31	14 41 4.2	10.1	5.8	0.40
10	18 3	9 21 1.98	+17 25 8.0	7.1	4.1	0.29	26	15 53	10 12 0.31	+14 41 52.9	10.2	5.9	0.40
11	18 1	9 22 45.92	17 18 47.4	7.2	4.1	0.29	27	15 49	10 12 15.55	14 42 57.4	10.2	5.9	0.40
12	17 58	9 24 28.57	17 12 30.2	7.2	4.1	0.29	28	15 45	10 12 27.95	14 44 17.9	10.3	6.0	0.41
13	17 56	9 26 9.91	17 6 16.7	7.3	4.2	0.29	29	15 42	10 12 37.47	14 45 54.6	10.4	6.0	0.41
14	17 54	9 27 49.93	17 0 7.1	7.3	4.2	0.29	30	15 38	10 12 44.08	14 47 47.7	10.5	6.1	0.41
15	17 52	9 29 28.63	+16 54 1.6	7.4	4.2	0.29	31	15 34	10 12 47.73	+14 49 57.2	10.6	6.1	0.42
16	17 49	9 31 5.97	+16 48 0.6	7.4	4.3	0.30	32	15 30	10 12 48.38	+14 52 23.4	10.6	6.1	0.42

Stellar magnitude at opposition, in February, 1916, −1.0.

JUPITER, 1915.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
July 1	17 17	23 54 51.99	−1 57 13.4	1.9	20.1	1.43	Aug. 16	14 14	23 52 3.30	−2 29 53.9	2.1	23.0	1.63
2	17 14	23 55 4.07	1 56 14.3	1.9	20.2	1.43	17	14 9	23 51 43.85	2 32 15.4	2.2	23.0	1.64
3	17 10	23 55 15.48	1 55 19.7	1.9	20.3	1.44	18	14 5	23 51 23.84	2 34 40.3	2.2	23.1	1.64
4	17 6	23 55 26.21	1 54 29.6	1.9	20.3	1.44	19	14 1	23 51 3.29	2 37 8.4	2.2	23.1	1.64
5	17 2	23 55 36.25	1 53 44.0	1.9	20.4	1.45	20	13 57	23 50 42.20	2 39 39.7	2.2	23.2	1.65
6	16 59	23 55 45.60	−1 53 2.9	1.9	20.5	1.45	21	13 52	23 50 20.58	−2 42 14.0	2.2	23.2	1.65
7	16 55	23 55 54.26	1 52 26.3	1.9	20.5	1.46	22	13 48	23 49 58.45	2 44 51.3	2.2	23.2	1.65
8	16 51	23 56 2.23	1 51 54.2	1.9	20.6	1.46	23	13 44	23 49 35.82	2 47 31.4	2.2	23.3	1.66
9	16 47	23 56 9.50	1 51 26.7	1.9	20.7	1.47	24	13 39	23 49 12.71	2 50 14.3	2.2	23.3	1.66
10	16 43	23 56 16.07	1 51 3.9	1.9	20.7	1.47	25	13 35	23 48 49.14	2 52 59.8	2.2	23.3	1.66
11	16 39	23 56 21.93	−1 50 45.7	1.9	20.8	1.48	26	13 31	23 48 25.11	−2 55 47.8	2.2	23.4	1.66
12	16 36	23 56 27.07	1 50 32.2	2.0	20.9	1.48	27	13 26	23 48 0.64	2 58 38.3	2.2	23.4	1.66
13	16 32	23 56 31.50	1 50 23.3	2.0	20.9	1.49	28	13 22	23 47 35.75	3 1 31.2	2.2	23.4	1.67
14	16 28	23 56 35.22	1 50 19.0	2.0	21.0	1.49	29	13 18	23 47 10.45	3 4 26.4	2.2	23.5	1.67
15	16 24	23 56 38.23	1 50 19.3	2.0	21.0	1.50	30	13 13	23 46 44.76	3 7 23.6	2.2	23.5	1.67
16	16 20	23 56 40.53	−1 50 24.3	2.0	21.1	1.50	31	13 9	23 46 18.71	−3 10 22.8	2.2	23.5	1.67
17	16 16	23 56 42.11	1 50 34.0	2.0	21.2	1.51	Sept. 1	13 5	23 45 52.30	3 13 23.8	2.2	23.6	1.68
18	16 12	23 56 42.97	1 50 48.3	2.0	21.2	1.51	2	13 0	23 45 25.55	3 16 26.6	2.2	23.6	1.68
19	16 8	23 56 43.12	1 51 7.1	2.0	21.3	1.51	3	12 56	23 44 58.49	3 19 31.0	2.2	23.6	1.68
20	16 4	23 56 42.55	1 51 30.5	2.0	21.4	1.52	4	12 52	23 44 31.12	3 22 36.9	2.2	23.6	1.68
21	16 1	23 56 41.27	−1 51 58.6	2.0	21.4	1.52	5	12 47	23 44 3.46	−3 25 44.1	2.2	23.7	1.68
22	15 57	23 56 39.27	1 52 31.2	2.0	21.5	1.53	6	12 43	23 43 35.54	3 28 52.6	2.2	23.7	1.68
23	15 53	23 56 36.56	1 53 8.4	2.0	21.6	1.53	7	12 38	23 43 7.39	3 32 2.1	2.2	23.7	1.68
24	15 49	23 56 33.13	1 53 50.2	2.0	21.6	1.54	8	12 34	23 42 39.03	3 35 12.4	2.2	23.7	1.69
25	15 45	23 56 28.98	1 54 36.5	2.0	21.7	1.54	9	12 29	23 42 10.47	3 38 23.5	2.2	23.7	1.69
26	15 41	23 56 24.13	−1 55 27.4	2.0	21.8	1.55	10	12 25	23 41 41.74	−3 41 35.2	2.2	23.7	1.69
27	15 37	23 56 18.57	1 56 22.8	2.0	21.8	1.55	11	12 21	23 41 12.87	3 44 47.3	2.2	23.7	1.69
28	15 33	23 56 12.30	1 57 22.7	2.0	21.9	1.56	12	12 16	23 40 43.87	3 47 59.7	2.2	23.7	1.69
29	15 28	23 56 5.32	1 58 27.1	2.1	22.0	1.56	13	12 12	23 40 14.77	3 51 12.2	2.2	23.7	1.69
30	15 24	23 55 57.63	1 59 36.0	2.1	22.0	1.57	14	12 7	23 39 45.59	3 54 24.6	2.2	23.7	1.69
31	15 20	23 55 49.25	−2 0 49.3	2.1	22.1	1.57	15	12 3	23 39 16.35	−3 57 36.9	2.2	23.7	1.69
Aug. 1	15 16	23 55 40.16	2 2 7.0	2.1	22.1	1.57	16	11 59	23 38 47.07	4 0 48.9	2.2	23.7	1.69
2	15 12	23 55 30.36	2 3 29.2	2.1	22.2	1.58	17	11 54	23 38 17.78	4 4 0.5	2.2	23.7	1.69
3	15 8	23 55 19.87	2 4 55.7	2.1	22.3	1.58	18	11 50	23 37 48.49	4 7 11.5	2.2	23.7	1.69
4	15 4	23 55 8.70	2 6 26.6	2.1	22.3	1.59	19	11 45	23 37 19.23	4 10 21.8	2.2	23.7	1.69
5	15 0	23 54 56.84	−2 8 1.8	2.1	22.4	1.59	20	11 41	23 36 50.02	−4 13 31.1	2.2	23.7	1.69
6	14 56	23 54 44.30	2 9 41.2	2.1	22.5	1.60	21	11 37	23 36 20.88	4 16 39.4	2.2	23.7	1.69
7	14 52	23 54 31.08	2 11 24.7	2.1	22.5	1.60	22	11 32	23 35 51.83	4 19 46.6	2.2	23.7	1.69
8	14 47	23 54 17.21	2 13 12.4	2.1	22.6	1.60	23	11 28	23 35 22.90	4 22 52.6	2.2	23.7	1.69
9	14 43	23 54 2.68	2 15 4.1	2.1	22.6	1.61	24	11 23	23 34 54.11	4 25 57.2	2.2	23.7	1.69
10	14 39	23 53 47.50	−2 16 59.8	2.1	22.7	1.61	25	11 19	23 34 25.48	−4 29 0.2	2.2	23.7	1.69
11	14 35	23 53 31.68	2 18 59.5	2.1	22.7	1.61	26	11 14	23 33 57.02	4 32 1.4	2.2	23.7	1.68
12	14 31	23 53 15.22	2 21 3.0	2.1	22.8	1.62	27	11 10	23 33 28.76	4 35 0.9	2.2	23.7	1.68
13	14 26	23 52 58.15	2 23 10.3	2.1	22.8	1.62	28	11 6	23 33 0.72	4 37 58.5	2.2	23.6	1.68
14	14 22	23 52 40.46	2 25 21.2	2.1	22.9	1.62	29	11 1	23 32 32.91	4 40 54.1	2.2	23.6	1.68
15	14 18	23 52 22.18	−2 27 35.8	2.1	22.9	1.63	30	10 57	23 32 5.35	−4 43 47.4	2.2	23.6	1.68
16	14 14	23 52 3.30	−2 29 53.9	2.1	23.0	1.63	Oct. 1	10 53	23 31 38.08	−4 46 38.4	2.2	23.6	1.68

Stellar magnitude at opposition, in September, 1915, −2.5.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	10 53	23 31 38.08	−4 46 38.4	2.2	23.6	1.68	Nov. 16	7 40	23 20 24.06	−5 49 15.2	2.0	21.1	1.50
2	10 48	23 31 11.12	4 49 27.0	2.2	23.5	1.68	17	7 36	23 20 25.74	5 48 48.1	2.0	21.0	1.50
3	10 44	23 30 44.49	4 52 13.1	2.2	23.5	1.67	18	7 33	23 20 28.17	5 48 16.1	2.0	21.0	1.49
4	10 39	23 30 18.19	4 54 56.5	2.2	23.5	1.67	19	7 29	23 20 31.37	5 47 39.3	2.0	20.9	1.49
5	10 35	23 29 52.25	4 57 37.0	2.2	23.4	1.67	20	7 25	23 20 35.32	5 46 57.7	1.9	20.8	1.48
6	10 31	23 29 26.70	−5 0 14.5	2.2	23.4	1.67	21	7 21	23 20 40.02	−5 46 11.2	1.9	20.8	1.48
7	10 26	23 29 1.55	5 2 48.9	2.2	23.4	1.66	22	7 17	23 20 45.48	5 45 19.9	1.9	20.7	1.47
8	10 22	23 28 36.82	5 5 20.2	2.2	23.3	1.66	23	7 13	23 20 51.68	5 44 23.9	1.9	20.6	1.47
9	10 18	23 28 12.54	5 7 48.2	2.2	23.3	1.66	24	7 10	23 20 58.61	5 43 23.2	1.9	20.6	1.46
10	10 13	23 27 48.72	5 10 12.8	2.2	23.2	1.66	25	7 6	23 21 6.28	5 42 17.8	1.9	20.5	1.46
11	10 9	23 27 25.37	−5 12 33.9	2.2	23.2	1.65	26	7 2	23 21 14.70	−5 41 7.7	1.9	20.4	1.45
12	10 5	23 27 2.51	5 14 51.4	2.2	23.2	1.65	27	6 58	23 21 23.85	5 39 52.9	1.9	20.4	1.45
13	10 0	23 26 40.16	5 17 5.2	2.2	23.1	1.65	28	6 54	23 21 33.72	5 38 33.4	1.9	20.3	1.44
14	9 56	23 26 18.34	5 19 15.2	2.2	23.1	1.64	29	6 51	23 21 44.33	5 37 9.2	1.9	20.2	1.44
15	9 52	23 25 57.07	5 21 21.3	2.2	23.0	1.64	30	6 47	23 21 55.66	5 35 40.5	1.9	20.2	1.43
16	9 47	23 25 36.36	−5 23 23.5	2.2	23.0	1.64	Dec. 1	6 43	23 22 7.71	−5 34 7.2	1.9	20.1	1.43
17	9 43	23 25 16.21	5 25 21.7	2.1	22.9	1.63	2	6 39	23 22 20.49	5 32 29.4	1.9	20.0	1.43
18	9 39	23 24 56.64	5 27 15.7	2.1	22.9	1.63	3	6 36	23 22 33.99	5 30 46.9	1.9	20.0	1.42
19	9 35	23 24 37.66	5 29 5.6	2.1	22.8	1.63	4	6 32	23 22 48.19	5 29 0.0	1.9	19.9	1.42
20	9 30	23 24 19.28	5 30 51.3	2.1	22.8	1.62	5	6 28	23 23 3.09	5 27 8.6	1.9	19.8	1.41
21	9 26	23 24 1.53	−5 32 32.7	2.1	22.7	1.62	6	6 25	23 23 18.69	−5 25 12.8	1.8	19.8	1.41
22	9 22	23 23 44.41	5 34 9.8	2.1	22.7	1.62	7	6 21	23 23 34.99	5 23 12.6	1.8	19.7	1.40
23	9 18	23 23 27.92	5 35 42.5	2.1	22.6	1.61	8	6 17	23 23 51.98	5 21 8.0	1.8	19.6	1.40
24	9 14	23 23 12.08	5 37 10.8	2.1	22.6	1.61	9	6 14	23 24 9.65	5 18 59.1	1.8	19.6	1.40
25	9 9	23 22 56.90	5 38 34.6	2.1	22.5	1.60	10	6 10	23 24 28.00	5 16 45.9	1.8	19.5	1.39
26	9 5	23 22 42.38	−5 39 53.9	2.1	22.4	1.60	11	6 6	23 24 47.02	−5 14 28.4	1.8	19.4	1.39
27	9 1	23 22 28.54	5 41 8.7	2.1	22.4	1.60	12	6 3	23 25 6.71	5 12 6.8	1.8	19.4	1.38
28	8 57	23 22 15.39	5 42 18.9	2.1	22.3	1.59	13	5 59	23 25 27.06	5 9 41.0	1.8	19.3	1.38
29	8 53	23 22 2.94	5 43 24.4	2.1	22.3	1.59	14	5 56	23 25 48.05	5 7 11.1	1.8	19.2	1.37
30	8 49	23 21 51.18	5 44 25.2	2.1	22.2	1.58	15	5 52	23 26 9.69	5 4 37.2	1.8	19.2	1.37
31	8 45	23 21 40.13	−5 45 21.2	2.1	22.2	1.58	16	5 49	23 26 31.95	−5 1 59.2	1.8	19.1	1.36
Nov. 1	8 40	23 21 29.79	5 46 12.5	2.1	22.1	1.57	17	5 45	23 26 54.84	4 59 17.3	1.8	19.1	1.36
2	8 36	23 21 20.17	5 46 59.0	2.1	22.0	1.57	18	5 41	23 27 18.35	4 56 31.5	1.8	19.0	1.35
3	8 32	23 21 11.28	5 47 40.7	2.0	22.0	1.56	19	5 38	23 27 42.48	4 53 41.9	1.8	18.9	1.35
4	8 28	23 21 3.13	5 48 17.6	2.0	21.9	1.56	20	5 34	23 28 7.21	4 50 48.5	1.8	18.9	1.35
5	8 24	23 20 55.72	−5 48 49.6	2.0	21.8	1.55	21	5 31	23 28 32.53	−4 47 51.2	1.8	18.8	1.34
6	8 20	23 20 49.05	5 49 16.6	2.0	21.8	1.55	22	5 27	23 28 58.46	4 44 50.2	1.8	18.8	1.34
7	8 16	23 20 43.13	5 49 38.7	2.0	21.7	1.55	23	5 24	23 29 24.98	4 41 45.4	1.8	18.7	1.33
8	8 12	23 20 37.98	5 49 55.8	2.0	21.6	1.54	24	5 20	23 29 52.07	4 38 36.9	1.7	18.6	1.33
9	8 8	23 20 33.58	5 50 8.0	2.0	21.6	1.54	25	5 17	23 30 19.73	4 35 24.9	1.7	18.6	1.33
10	8 4	23 20 29.94	−5 50 15.3	2.0	21.5	1.53	26	5 13	23 30 47.96	−4 32 9.3	1.7	18.5	1.32
11	8 0	23 20 27.06	5 50 17.6	2.0	21.4	1.53	27	5 10	23 31 16.74	4 28 50.2	1.7	18.5	1.32
12	7 56	23 20 24.94	5 50 14.9	2.0	21.4	1.52	28	5 7	23 31 46.07	4 25 27.5	1.7	18.4	1.31
13	7 52	23 20 23.57	5 50 7.3	2.0	21.3	1.52	29	5 3	23 32 15.95	4 22 1.4	1.7	18.4	1.31
14	7 48	23 20 22.97	5 49 54.8	2.0	21.2	1.51	30	5 0	23 32 46.38	4 18 31.8	1.7	18.3	1.31
15	7 44	23 20 23.13	−5 49 37.4	2.0	21.2	1.51	31	4 56	23 33 17.34	−4 14 58.9	1.7	18.3	1.30
16	7 40	23 20 24.06	−5 49 15.2	2.0	21.1	1.50	32	4 53	23 33 48.83	−4 11 22.6	1.7	18.2	1.30

Stellar magnitude at opposition, in September, 1915, −2.5.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
n. 0	11 12	5 51 14.13	+22 18 50.4	1.1	9.6	0.76	Feb. 15	8 1	5 40 22.43	+22 23 1.2	1.0	9.1	0.72
1	11 8	5 50 53.51	22 18 53.7	1.1	9.6	0.76	16	7 57	5 40 17.72	22 23 10.9	1.0	9.1	0.72
2	11 4	5 50 33.02	22 18 57.1	1.1	9.6	0.76	17	7 53	5 40 13.49	22 23 20.8	1.0	9.1	0.72
3	10 59	5 50 12.69	22 19 0.4	1.1	9.6	0.76	18	7 49	5 40 9.75	22 23 30.9	1.0	9.1	0.72
4	10 55	5 49 52.52	22 19 3.8	1.1	9.6	0.76	19	7 45	5 40 6.49	22 23 41.3	1.0	9.1	0.72
5	10 51	5 49 32.52	+22 19 7.2	1.1	9.6	0.76	20	7 41	5 40 3.72	+22 23 51.9	1.0	9.0	0.71
6	10 47	5 49 12.71	22 19 10.6	1.1	9.6	0.76	21	7 37	5 40 1.44	22 24 2.7	1.0	9.0	0.71
7	10 42	5 48 53.10	22 19 14.0	1.1	9.6	0.76	22	7 33	5 39 59.64	22 24 13.8	1.0	9.0	0.71
8	10 38	5 48 33.70	22 19 17.5	1.1	9.6	0.76	23	7 29	5 39 58.33	22 24 25.1	1.0	9.0	0.71
9	10 34	5 48 14.52	22 19 21.0	1.1	9.6	0.76	24	7 25	5 39 57.50	22 24 36.6	1.0	9.0	0.71
10	10 30	5 47 55.57	+22 19 24.6	1.1	9.6	0.76	25	7 21	5 39 57.15	+22 24 48.4	1.0	9.0	0.71
11	10 25	5 47 36.85	22 19 28.3	1.1	9.6	0.75	26	7 17	5 39 57.30	22 25 0.4	1.0	8.9	0.71
12	10 21	5 47 18.39	22 19 32.0	1.1	9.6	0.75	27	7 13	5 39 57.94	22 25 12.6	1.0	8.9	0.71
13	10 17	5 47 0.20	22 19 35.8	1.1	9.5	0.75	28	7 9	5 39 59.07	22 25 25.1	1.0	8.9	0.70
14	10 13	5 46 42.28	22 19 39.7	1.1	9.5	0.75	Mar. 1	7 5	5 40 0.68	22 25 37.8	1.0	8.9	0.70
15	10 8	5 46 24.64	+22 19 43.7	1.1	9.5	0.75	2	7 1	5 40 2.77	+22 25 50.7	1.0	8.9	0.70
16	10 4	5 46 7.30	22 19 47.8	1.1	9.5	0.75	3	6 57	5 40 5.34	22 26 3.8	1.0	8.9	0.70
17	10 0	5 45 50.26	22 19 51.9	1.1	9.5	0.75	4	6 54	5 40 8.38	22 26 17.1	1.0	8.8	0.70
18	9 56	5 45 33.54	22 19 56.2	1.1	9.5	0.75	5	6 50	5 40 11.92	22 26 30.6	1.0	8.8	0.70
19	9 52	5 45 17.14	22 20 0.6	1.1	9.5	0.75	6	6 46	5 40 15.94	22 26 44.3	1.0	8.8	0.70
20	9 47	5 45 1.07	+22 20 5.1	1.1	9.5	0.75	7	6 42	5 40 20.43	+22 26 58.3	1.0	8.8	0.70
21	9 43	5 44 45.35	22 20 9.7	1.1	9.5	0.75	8	6 38	5 40 25.40	22 27 12.4	1.0	8.8	0.69
22	9 39	5 44 29.98	22 20 14.4	1.1	9.5	0.75	9	6 34	5 40 30.86	22 27 26.7	1.0	8.8	0.69
23	9 35	5 44 14.96	22 20 19.3	1.1	9.4	0.75	10	6 30	5 40 36.79	22 27 41.2	1.0	8.8	0.69
24	9 31	5 44 0.31	22 20 24.3	1.1	9.4	0.74	11	6 27	5 40 43.19	22 27 55.9	1.0	8.7	0.69
25	9 27	5 43 46.03	+22 20 29.5	1.1	9.4	0.74	12	6 23	5 40 50.07	+22 28 10.7	1.0	8.7	0.69
26	9 22	5 43 32.13	22 20 34.8	1.1	9.4	0.74	13	6 19	5 40 57.43	22 28 25.7	1.0	8.7	0.69
27	9 18	5 43 18.62	22 20 40.2	1.1	9.4	0.74	14	6 15	5 41 5.25	22 28 40.9	1.0	8.7	0.69
28	9 14	5 43 5.50	22 20 45.9	1.1	9.4	0.74	15	6 11	5 41 13.54	22 28 56.2	1.0	8.7	0.69
29	9 10	5 42 52.77	22 20 51.7	1.1	9.4	0.74	16	6 8	5 41 22.30	22 29 11.6	1.0	8.7	0.68
30	9 6	5 42 40.45	+22 20 57.6	1.1	9.4	0.74	17	6 4	5 41 31.52	+22 29 27.2	1.0	8.6	0.68
31	9 2	5 42 28.54	22 21 3.8	1.1	9.3	0.74	18	6 0	5 41 41.20	22 29 42.9	1.0	8.6	0.68
Feb. 1	8 58	5 42 17.04	22 21 10.1	1.1	9.3	0.74	19	5 56	5 41 51.33	22 29 58.8	1.0	8.6	0.68
2	8 53	5 42 5.97	22 21 16.7	1.1	9.3	0.74	20	5 52	5 42 1.92	22 30 14.7	1.0	8.6	0.68
3	8 49	5 41 55.32	22 21 23.4	1.1	9.3	0.73	21	5 49	5 42 12.97	22 30 30.7	1.0	8.6	0.68
4	8 45	5 41 45.09	+22 21 30.3	1.1	9.3	0.73	22	5 45	5 42 24.46	+22 30 46.8	1.0	8.6	0.68
5	8 41	5 41 35.30	22 21 37.5	1.1	9.3	0.73	23	5 41	5 42 36.39	22 31 3.0	1.0	8.5	0.68
6	8 37	5 41 25.96	22 21 44.8	1.1	9.3	0.73	24	5 38	5 42 48.76	22 31 19.3	1.0	8.5	0.67
7	8 33	5 41 17.06	22 21 52.4	1.1	9.2	0.73	25	5 34	5 43 1.57	22 31 35.6	1.0	8.5	0.67
8	8 29	5 41 8.61	22 22 0.2	1.0	9.2	0.73	26	5 30	5 43 14.80	22 31 52.0	1.0	8.5	0.67
9	8 25	5 41 0.61	+22 22 8.2	1.0	9.2	0.73	27	5 26	5 43 28.46	+22 32 8.4	1.0	8.5	0.67
10	8 21	5 40 53.08	22 22 16.4	1.0	9.2	0.73	28	5 23	5 43 42.54	22 32 24.9	1.0	8.5	0.67
11	8 17	5 40 46.01	22 22 24.9	1.0	9.2	0.73	29	5 19	5 43 57.05	22 32 41.4	1.0	8.5	0.67
12	8 13	5 40 39.40	22 22 33.6	1.0	9.2	0.72	30	5 15	5 44 11.97	22 32 57.9	1.0	8.4	0.67
13	8 9	5 40 33.27	22 22 42.6	1.0	9.2	0.72	31	5 12	5 44 27.30	22 33 14.4	1.0	8.4	0.67
14	8 5	5 40 27.61	+22 22 51.8	1.0	9.1	0.72	Apr. 1	5 8	5 44 43.03	+22 33 30.9	1.0	8.4	0.66
15	8 1	5 40 22.43	+22 23 1.2	1.0	9.1	0.72	2	5 4	5 44 59.17	+22 33 47.4	1.0	8.4	0.66

Stellar magnitude at opposition, in January, 1916, −0.2.

SATURN, 1915.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Oct. 1	18 28	7 8 20.72	+21 56 35.5	1.0	8.5	0.67	Nov. 16	15 29	7 9 58.42	+21 55 38.0	1.0	9.2	0.73
2	18 24	7 8 33.21	21 56 16.9	1.0	8.5	0.67	17	15 25	7 9 49.57	21 55 55.9	1.1	9.3	0.73
3	18 20	7 8 45.27	21 55 58.9	1.0	8.5	0.67	18	15 21	7 9 40.28	21 56 14.6	1.1	9.3	0.73
4	18 17	7 8 56.90	21 55 41.6	1.0	8.6	0.67	19	15 16	7 9 30.55	21 56 34.0	1.1	9.3	0.73
5	18 13	7 9 8.09	21 55 25.0	1.0	8.6	0.68	20	15 12	7 9 20.39	21 56 54.2	1.1	9.3	0.73
6	18 9	7 9 18.83	+21 55 9.0	1.0	8.6	0.68	21	15 8	7 9 9.81	+21 57 15.1	1.1	9.3	0.73
7	18 5	7 9 29.13	21 54 53.8	1.0	8.6	0.68	22	15 4	7 8 58.81	21 57 36.7	1.1	9.3	0.73
8	18 2	7 9 38.99	21 54 39.3	1.0	8.6	0.68	23	15 0	7 8 47.39	21 57 59.0	1.1	9.3	0.74
9	17 58	7 9 48.39	21 54 25.5	1.0	8.6	0.68	24	14 56	7 8 35.56	21 58 22.0	1.1	9.4	0.74
10	17 54	7 9 57.34	21 54 12.4	1.0	8.7	0.68	25	14 52	7 8 23.32	21 58 45.6	1.1	9.4	0.74
11	17 50	7 10 5.83	+21 54 0.1	1.0	8.7	0.68	26	14 48	7 8 10.69	+21 59 9.9	1.1	9.4	0.74
12	17 47	7 10 13.87	21 53 48.5	1.0	8.7	0.68	27	14 43	7 7 57.66	21 59 34.8	1.1	9.4	0.74
13	17 43	7 10 21.45	21 53 37.7	1.0	8.7	0.68	28	14 39	7 7 44.24	22 0 0.3	1.1	9.4	0.74
14	17 39	7 10 28.56	21 53 27.7	1.0	8.7	0.69	29	14 35	7 7 30.44	22 0 26.5	1.1	9.4	0.74
15	17 35	7 10 35.21	21 53 18.5	1.0	8.7	0.69	30	14 31	7 7 16.26	22 0 53.3	1.1	9.4	0.74
16	17 31	7 10 41.40	+21 53 10.0	1.0	8.8	0.69	Dec. 1	14 27	7 7 1.72	+22 1 20.7	1.1	9.4	0.74
17	17 27	7 10 47.13	21 53 2.3	1.0	8.8	0.69	2	14 23	7 6 46.81	22 1 48.6	1.1	9.4	0.74
18	17 24	7 10 52.38	21 52 55.4	1.0	8.8	0.69	3	14 18	7 6 31.55	22 2 17.1	1.1	9.5	0.75
19	17 20	7 10 57.17	21 52 49.3	1.0	8.8	0.69	4	14 14	7 6 15.94	22 2 46.1	1.1	9.5	0.75
20	17 16	7 11 1.49	21 52 44.0	1.0	8.8	0.69	5	14 10	7 6 0.00	22 3 15.6	1.1	9.5	0.75
21	17 12	7 11 5.33	+21 52 39.6	1.0	8.8	0.70	6	14 6	7 5 43.73	+22 3 45.6	1.1	9.5	0.75
22	17 8	7 11 8.71	21 52 36.0	1.0	8.8	0.70	7	14 2	7 5 27.13	22 4 16.1	1.1	9.5	0.75
23	17 4	7 11 11.61	21 52 33.2	1.0	8.9	0.70	8	13 57	7 5 10.23	22 4 47.1	1.1	9.5	0.75
24	17 0	7 11 14.03	21 52 31.2	1.0	8.9	0.70	9	13 53	7 4 53.03	22 5 18.4	1.1	9.5	0.75
25	16 57	7 11 15.98	21 52 30.0	1.0	8.9	0.70	10	13 49	7 4 35.53	22 5 50.2	1.1	9.5	0.75
26	16 53	7 11 17.46	+21 52 29.7	1.0	8.9	0.70	11	13 45	7 4 17.76	+22 6 22.4	1.1	9.5	0.75
27	16 49	7 11 18.45	21 52 30.2	1.0	8.9	0.70	12	13 40	7 3 59.72	22 6 54.9	1.1	9.5	0.75
28	16 45	7 11 18.97	21 52 31.6	1.0	8.9	0.70	13	13 36	7 3 41.41	22 7 27.7	1.1	9.6	0.75
29	16 41	7 11 19.01	21 52 33.8	1.0	9.0	0.71	14	13 32	7 3 22.86	22 8 0.9	1.1	9.6	0.75
30	16 37	7 11 18.57	21 52 36.8	1.0	9.0	0.71	15	13 28	7 3 4.07	22 8 34.3	1.1	9.6	0.75
31	16 33	7 11 17.65	+21 52 40.7	1.0	9.0	0.71	16	13 24	7 2 45.05	+22 9 8.0	1.1	9.6	0.75
Nov. 1	16 29	7 11 16.25	21 52 45.5	1.0	9.0	0.71	17	13 19	7 2 25.81	22 9 42.0	1.1	9.6	0.76
2	16 25	7 11 14.37	21 52 51.1	1.0	9.0	0.71	18	13 15	7 2 6.36	22 10 16.3	1.1	9.6	0.76
3	16 21	7 11 12.00	21 52 57.6	1.0	9.0	0.71	19	13 11	7 1 46.72	22 10 50.7	1.1	9.6	0.76
4	16 17	7 11 9.16	21 53 4.9	1.0	9.1	0.71	20	13 6	7 1 26.89	22 11 25.3	1.1	9.6	0.76
5	16 13	7 11 5.84	+21 53 13.1	1.0	9.1	0.71	21	13 2	7 1 6.88	+22 12 0.1	1.1	9.6	0.76
6	16 9	7 11 2.05	21 53 22.2	1.0	9.1	0.72	22	12 58	7 0 46.71	22 12 35.1	1.1	9.6	0.76
7	16 5	7 10 57.78	21 53 32.1	1.0	9.1	0.72	23	12 54	7 0 26.39	22 13 10.2	1.1	9.6	0.76
8	16 1	7 10 53.03	21 53 42.8	1.0	9.1	0.72	24	12 49	7 0 5.92	22 13 45.4	1.1	9.6	0.76
9	15 57	7 10 47.82	21 53 54.3	1.0	9.1	0.72	25	12 45	6 59 45.32	22 14 20.7	1.1	9.6	0.76
10	15 53	7 10 42.15	+21 54 6.7	1.0	9.2	0.72	26	12 41	6 59 24.60	+22 14 56.1	1.1	9.6	0.76
11	15 49	7 10 36.00	21 54 19.9	1.0	9.2	0.72	27	12 37	6 59 3.77	22 15 31.6	1.1	9.6	0.76
12	15 45	7 10 29.39	21 54 33.9	1.0	9.2	0.72	28	12 32	6 58 42.84	22 16 7.1	1.1	9.6	0.76
13	15 41	7 10 22.33	21 54 48.8	1.0	9.2	0.72	29	12 28	6 58 21.84	22 16 42.6	1.1	9.6	0.76
14	15 37	7 10 14.81	21 55 4.4	1.0	9.2	0.73	30	12 24	6 58 0.76	22 17 18.1	1.1	9.6	0.76
15	15 33	7 10 6.84	+21 55 20.8	1.0	9.2	0.73	31	12 19	6 57 39.61	+22 17 53.6	1.1	9.6	0.76
16	15 29	7 9 58.42	+21 55 38.0	1.0	9.2	0.73	32	12 15	6 57 18.41	+22 18 29.1	1.1	9.6	0.76

Stellar magnitude at opposition, in January, 1916, —0.2.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
May 12	17 53	21 13 15.20	−16 47 34.2	0.4	1.7	0.12	June 27	14 50	21 11 11.62	−16 58 24.5	0.5	1.8	0.12
13	17 49	21 13 16.73	16 47 29.7	0.4	1.7	0.12	28	14 46	21 11 4.99	16 58 55.6	0.5	1.8	0.12
14	17 45	21 13 18.06	16 47 26.2	0.4	1.7	0.12	29	14 42	21 10 58.23	16 59 27.2	0.5	1.8	0.12
15	17 41	21 13 19.19	16 47 23.6	0.4	1.7	0.12	30	14 38	21 10 51.33	16 59 59.4	0.5	1.8	0.12
16	17 37	21 13 20.13	16 47 21.8	0.4	1.7	0.12	July 1	14 34	21 10 44.31	17 0 32.1	0.5	1.8	0.12
17	17 33	21 13 20.87	−16 47 21.0	0.4	1.7	0.12	2	14 30	21 10 37.15	−17 1 5.4	0.5	1.8	0.12
18	17 29	21 13 21.41	16 47 20.9	0.4	1.7	0.12	3	14 25	21 10 29.87	17 1 39.1	0.5	1.8	0.12
19	17 25	21 13 21.76	16 47 21.7	0.4	1.7	0.12	4	14 21	21 10 22.47	17 2 13.3	0.5	1.8	0.12
20	17 21	21 13 21.91	16 47 23.4	0.4	1.7	0.12	5	14 17	21 10 14.94	17 2 48.0	0.5	1.8	0.12
21	17 17	21 13 21.87	16 47 26.0	0.4	1.7	0.12	6	14 13	21 10 7.30	17 3 23.2	0.5	1.8	0.12
22	17 14	21 13 21.63	−16 47 29.4	0.4	1.7	0.12	7	14 9	21 9 59.54	−17 3 58.8	0.5	1.8	0.12
23	17 10	21 13 21.19	16 47 33.7	0.4	1.7	0.12	8	14 5	21 9 51.67	17 4 34.8	0.5	1.8	0.12
24	17 6	21 13 20.56	16 47 38.9	0.4	1.7	0.12	9	14 1	21 9 43.70	17 5 11.2	0.5	1.8	0.12
25	17 2	21 13 19.74	16 47 44.9	0.5	1.7	0.12	10	13 57	21 9 35.62	17 5 48.1	0.5	1.8	0.12
26	16 58	21 13 18.73	16 47 51.8	0.5	1.7	0.12	11	13 53	21 9 27.43	17 6 25.4	0.5	1.8	0.12
27	16 54	21 13 17.53	−16 47 59.5	0.5	1.7	0.12	12	13 49	21 9 19.15	−17 7 3.0	0.5	1.8	0.12
28	16 50	21 13 16.14	16 48 8.1	0.5	1.7	0.12	13	13 45	21 9 10.77	17 7 41.0	0.5	1.8	0.12
29	16 46	21 13 14.56	16 48 17.5	0.5	1.7	0.12	14	13 41	21 9 2.30	17 8 19.3	0.5	1.8	0.12
30	16 42	21 13 12.79	16 48 27.7	0.5	1.7	0.12	15	13 37	21 8 53.74	17 8 58.0	0.5	1.8	0.12
31	16 38	21 13 10.83	16 48 38.7	0.5	1.7	0.12	16	13 33	21 8 45.10	17 9 37.0	0.5	1.8	0.12
June 1	16 34	21 13 8.69	−16 48 50.6	0.5	1.7	0.12	17	13 29	21 8 36.38	−17 10 16.2	0.5	1.8	0.12
2	16 30	21 13 6.36	16 49 3.3	0.5	1.7	0.12	18	13 25	21 8 27.58	17 10 55.7	0.5	1.8	0.12
3	16 26	21 13 3.85	16 49 16.8	0.5	1.7	0.12	19	13 20	21 8 18.71	17 11 35.5	0.5	1.8	0.12
4	16 22	21 13 1.15	16 49 31.1	0.5	1.7	0.12	20	13 16	21 8 9.76	17 12 15.5	0.5	1.8	0.12
5	16 18	21 12 58.27	16 49 46.2	0.5	1.7	0.12	21	13 12	21 8 0.75	17 12 55.7	0.5	1.8	0.12
6	16 14	21 12 55.21	−16 50 2.1	0.5	1.7	0.12	22	13 8	21 7 51.68	−17 13 36.1	0.5	1.8	0.12
7	16 10	21 12 51.96	16 50 18.8	0.5	1.7	0.12	23	13 4	21 7 42.55	17 14 16.8	0.5	1.8	0.12
8	16 6	21 12 48.53	16 50 36.3	0.5	1.7	0.12	24	13 0	21 7 33.37	17 14 57.6	0.5	1.8	0.12
9	16 2	21 12 44.92	16 50 54.5	0.5	1.7	0.12	25	12 56	21 7 24.13	17 15 38.6	0.5	1.8	0.12
10	15 58	21 12 41.14	16 51 13.5	0.5	1.7	0.12	26	12 52	21 7 14.84	17 16 19.7	0.5	1.8	0.12
11	15 54	21 12 37.18	−16 51 33.3	0.5	1.7	0.12	27	12 48	21 7 5.51	−17 17 0.9	0.5	1.8	0.12
12	15 50	21 12 33.05	16 51 53.8	0.5	1.7	0.12	28	12 44	21 6 56.14	17 17 42.2	0.5	1.8	0.12
13	15 46	21 12 28.74	16 52 15.1	0.5	1.7	0.12	29	12 40	21 6 46.73	17 18 23.6	0.5	1.8	0.12
14	15 42	21 12 24.27	16 52 37.1	0.5	1.7	0.12	30	12 35	21 6 37.29	17 19 5.1	0.5	1.8	0.12
15	15 38	21 12 19.63	16 52 59.9	0.5	1.7	0.12	31	12 31	21 6 27.82	17 19 46.7	0.5	1.8	0.12
16	15 34	21 12 14.82	−16 53 23.3	0.5	1.7	0.12	Aug. 1	12 27	21 6 18.32	−17 20 28.3	0.5	1.8	0.12
17	15 30	21 12 9.85	16 53 47.4	0.5	1.7	0.12	2	12 23	21 6 8.79	17 21 9.9	0.5	1.8	0.12
18	15 26	21 12 4.72	16 54 12.2	0.5	1.7	0.12	3	12 19	21 5 59.24	17 21 51.5	0.5	1.8	0.12
19	15 22	21 11 59.43	16 54 37.7	0.5	1.7	0.12	4	12 15	21 5 49.68	17 22 33.1	0.5	1.8	0.12
20	15 18	21 11 53.98	16 55 3.8	0.5	1.7	0.12	5	12 11	21 5 40.12	17 23 14.7	0.5	1.8	0.12
21	15 14	21 11 48.38	−16 55 30.6	0.5	1.7	0.12	6	12 7	21 5 30.54	−17 23 56.3	0.5	1.8	0.12
22	15 10	21 11 42.62	16 55 58.0	0.5	1.7	0.12	7	12 3	21 5 20.96	17 24 37.8	0.5	1.8	0.12
23	15 6	21 11 36.71	16 56 26.1	0.5	1.7	0.12	8	11 59	21 5 11.38	17 25 19.2	0.5	1.8	0.12
24	15 2	21 11 30.65	16 56 54.8	0.5	1.7	0.12	9	11 55	21 5 1.81	17 26 0.5	0.5	1.8	0.12
25	14 58	21 11 24.45	16 57 24.1	0.5	1.7	0.12	10	11 51	21 4 52.25	17 26 41.8	0.5	1.8	0.12
26	14 54	21 11 18.11	−16 57 54.0	0.5	1.8	0.12	11	11 46	21 4 42.70	−17 27 22.9	0.5	1.8	0.12
27	14 50	21 11 11.62	−16 58 24.5	0.5	1.8	0.12	12	11 42	21 4 33.17	−17 28 3.9	0.5	1.8	0.12

Stellar magnitude at opposition, in August, 1915, 6.0.

URANUS, 1915.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s
Aug. 12	11 42	21 4 33.17	−17 28 3.9	0.5	1.8	0.12
13	11 38	21 4 23.66	17 28 44.7	0.5	1.8	0.12
14	11 34	21 4 14.18	17 29 25.3	0.5	1.8	0.12
15	11 30	21 4 4.73	17 30 5.7	0.5	1.8	0.12
16	11 26	21 3 55.31	17 30 45.8	0.5	1.8	0.12
17	11 22	21 3 45.93	−17 31 25.6	0.5	1.8	0.12
18	11 18	21 3 36.58	17 32 5.3	0.5	1.8	0.12
19	11 14	21 3 27.28	17 32 44.8	0.5	1.8	0.12
20	11 10	21 3 18.03	17 33 23.9	0.5	1.8	0.12
21	11 6	21 3 8.84	17 34 2.7	0.5	1.8	0.12
22	11 1	21 2 59.70	−17 34 41.2	0.5	1.8	0.12
23	10 57	21 2 50.62	17 35 19.4	0.5	1.8	0.12
24	10 53	21 2 41.61	17 35 57.3	0.5	1.8	0.12
25	10 49	21 2 32.67	17 36 34.8	0.5	1.8	0.12
26	10 45	21 2 23.79	17 37 12.0	0.5	1.8	0.12
27	10 41	21 2 14.99	−17 37 48.7	0.5	1.8	0.12
28	10 37	21 2 6.26	17 38 25.1	0.5	1.8	0.12
29	10 33	21 1 57.61	17 39 1.1	0.5	1.8	0.12
30	10 29	21 1 49.05	17 39 36.6	0.5	1.8	0.12
31	10 25	21 1 40.58	17 40 11.7	0.5	1.8	0.12
Sept. 1	10 21	21 1 32.21	−17 40 46.3	0.5	1.8	0.12
2	10 17	21 1 23.93	17 41 20.5	0.5	1.8	0.12
3	10 13	21 1 15.75	17 41 54.2	0.5	1.8	0.12
4	10 9	21 1 7.67	17 42 27.4	0.5	1.8	0.12
5	10 4	21 0 59.70	17 43 0.1	0.5	1.8	0.12
6	10 0	21 0 51.84	−17 43 32.3	0.5	1.8	0.12
7	9 56	21 0 44.08	17 44 3.9	0.5	1.8	0.12
8	9 52	21 0 36.45	17 44 35.0	0.5	1.8	0.12
9	9 48	21 0 28.94	17 45 5.6	0.5	1.8	0.12
10	9 44	21 0 21.55	17 45 35.5	0.5	1.8	0.12
11	9 40	21 0 14.28	−17 46 4.9	0.5	1.8	0.12
12	9 36	21 0 7.15	17 46 33.7	0.5	1.8	0.12
13	9 32	21 0 0.16	17 47 1.9	0.5	1.8	0.12
14	9 28	20 59 53.30	17 47 29.4	0.5	1.8	0.12
15	9 24	20 59 46.58	17 47 56.3	0.5	1.8	0.12
16	9 20	20 59 40.00	−17 48 22.6	0.5	1.8	0.12
17	9 16	20 59 33.57	17 48 48.2	0.5	1.8	0.12
18	9 12	20 59 27.28	17 49 13.1	0.5	1.7	0.12
19	9 8	20 59 21.15	17 49 37.4	0.5	1.7	0.12
20	9 4	20 59 15.17	17 50 1.0	0.5	1.7	0.12
21	9 0	20 59 9.35	−17 50 23.9	0.5	1.7	0.12
22	8 55	20 59 3.68	17 50 46.1	0.5	1.7	0.12
23	8 51	20 58 58.17	17 51 7.6	0.5	1.7	0.12
24	8 47	20 58 52.82	17 51 28.5	0.5	1.7	0.12
25	8 43	20 58 47.63	17 51 48.6	0.5	1.7	0.12
26	8 39	20 58 42.61	−17 52 8.0	0.5	1.7	0.12
27	8 35	20 58 37.75	−17 52 26.6	0.5	1.7	0.12
Sept. 27	8 35	20 58 37.75	−17 52 26.6	0.5	1.7	0.12
28	8 31	20 58 33.07	17 52 44.5	0.5	1.7	0.12
29	8 27	20 58 28.56	17 53 1.7	0.5	1.7	0.12
30	8 23	20 58 24.23	17 53 18.1	0.5	1.7	0.12
Oct. 1	8 19	20 58 20.07	17 53 33.7	0.5	1.7	0.12
2	8 15	20 58 16.10	−17 53 48.6	0.5	1.7	0.12
3	8 11	20 58 12.30	17 54 2.7	0.5	1.7	0.12
4	8 7	20 58 8.69	17 54 16.0	0.5	1.7	0.12
5	8 3	20 58 5.26	17 54 28.5	0.5	1.7	0.12
6	7 59	20 58 2.02	17 54 40.2	0.5	1.7	0.12
7	7 56	20 57 58.97	−17 54 51.2	0.5	1.7	0.12
8	7 52	20 57 56.12	17 55 1.3	0.5	1.7	0.12
9	7 48	20 57 53.45	17 55 10.6	0.5	1.7	0.12
10	7 44	20 57 50.97	17 55 19.1	0.5	1.7	0.12
11	7 40	20 57 48.69	17 55 26.8	0.5	1.7	0.12
12	7 36	20 57 46.60	−17 55 33.6	0.5	1.7	0.12
13	7 32	20 57 44.71	17 55 39.6	0.5	1.7	0.12
14	7 28	20 57 43.01	17 55 44.8	0.5	1.7	0.12
15	7 24	20 57 41.52	17 55 49.1	0.5	1.7	0.12
16	7 20	20 57 40.23	17 55 52.6	0.4	1.7	0.12
17	7 16	20 57 39.14	−17 55 55.2	0.4	1.7	0.12
18	7 12	20 57 38.25	17 55 57.0	0.4	1.7	0.12
19	7 8	20 57 37.56	17 55 58.0	0.4	1.7	0.12
20	7 5	20 57 37.07	17 55 58.1	0.4	1.7	0.12
21	7 0	20 57 36.79	17 55 57.4	0.4	1.7	0.12
22	6 56	20 57 36.71	−17 55 55.8	0.4	1.7	0.12
23	6 52	20 57 36.83	17 55 53.4	0.4	1.7	0.12
24	6 48	20 57 37.16	17 55 50.1	0.4	1.7	0.12
25	6 44	20 57 37.69	17 55 46.0	0.4	1.7	0.12
26	6 40	20 57 38.42	17 55 41.0	0.4	1.7	0.12
27	6 37	20 57 39.36	−17 55 35.2	0.4	1.7	0.12
28	6 33	20 57 40.50	17 55 28.6	0.4	1.7	0.12
29	6 29	20 57 41.85	17 55 21.1	0.4	1.7	0.12
30	6 25	20 57 43.40	17 55 12.7	0.4	1.7	0.12
31	6 21	20 57 45.16	17 55 3.5	0.4	1.7	0.12
Nov. 1	6 17	20 57 47.12	−17 54 53.4	0.4	1.7	0.12
2	6 13	20 57 49.29	17 54 42.5	0.4	1.7	0.12
3	6 9	20 57 51.66	17 54 30.7	0.4	1.7	0.12
4	6 5	20 57 54.23	17 54 18.1	0.4	1.7	0.12
5	6 1	20 57 57.01	17 54 4.6	0.4	1.7	0.12
6	5 58	20 58 0.00	−17 53 50.3	0.4	1.7	0.12
7	5 54	20 58 3.19	17 53 35.2	0.4	1.7	0.12
8	5 50	20 58 6.58	17 53 19.2	0.4	1.7	0.12
9	5 46	20 58 10.18	17 53 2.3	0.4	1.7	0.12
10	5 42	20 58 13.98	17 52 44.6	0.4	1.7	0.12
11	5 38	20 58 17.98	−17 52 26.1	0.4	1.7	0.12
12	5 34	20 58 22.18	−17 52 6.7	0.4	1.7	0.12

Stellar magnitude at opposition, in August, 1915, 6.0.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S. T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
m. 0	13 27	8 6 40.58	+19 52 42.3	0.3	1.3	0.09	Feb. 15	10 21	8 1 29.37	+20 8 35.9	0.3	1.3	0.09
1	13 23	8 6 34.05	19 53 2.4	0.3	1.3	0.09	16	10 17	8 1 23.37	20 8 54.4	0.3	1.3	0.09
2	13 19	8 6 27.48	19 53 22.6	0.3	1.3	0.09	17	10 13	8 1 17.44	20 9 12.6	0.3	1.3	0.09
3	13 15	8 6 20.85	19 53 42.9	0.3	1.3	0.09	18	10 9	8 1 11.59	20 9 30.6	0.3	1.3	0.09
4	13 11	8 6 14.18	19 54 3.4	0.3	1.3	0.09	19	10 5	8 1 5.82	20 9 48.4	0.3	1.3	0.09
5	13 7	8 6 7.47	+19 54 24.0	0.3	1.3	0.09	20	10 1	8 1 0.13	+20 10 5.9	0.3	1.3	0.09
6	13 3	8 6 0.71	19 54 44.8	0.3	1.3	0.09	21	9 57	8 0 54.53	20 10 23.1	0.3	1.3	0.09
7	12 59	8 5 53.91	19 55 5.7	0.3	1.3	0.09	22	9 53	8 0 49.02	20 10 40.1	0.3	1.3	0.09
8	12 55	8 5 47.07	19 55 26.7	0.3	1.3	0.09	23	9 49	8 0 43.59	20 10 56.8	0.3	1.3	0.09
9	12 51	8 5 40.20	19 55 47.8	0.3	1.3	0.09	24	9 45	8 0 38.25	20 11 13.3	0.3	1.3	0.09
10	12 47	8 5 33.30	+19 56 8.9	0.3	1.3	0.09	25	9 41	8 0 33.01	+20 11 29.6	0.3	1.3	0.09
11	12 43	8 5 26.37	19 56 30.2	0.3	1.3	0.09	26	9 37	8 0 27.86	20 11 45.6	0.3	1.3	0.09
12	12 39	8 5 19.42	19 56 51.5	0.3	1.3	0.09	27	9 33	8 0 22.81	20 12 1.3	0.3	1.3	0.09
13	12 35	8 5 12.45	19 57 12.9	0.3	1.3	0.09	28	9 29	8 0 17.86	20 12 16.7	0.3	1.3	0.09
14	12 31	8 5 5.46	19 57 34.3	0.3	1.3	0.09	Mar. 1	9 25	8 0 13.00	20 12 31.8	0.3	1.3	0.09
15	12 27	8 4 58.45	+19 57 55.8	0.3	1.3	0.09	2	9 21	8 0 8.25	+20 12 46.6	0.3	1.3	0.09
16	12 23	8 4 51.44	19 58 17.3	0.3	1.3	0.09	3	9 17	8 0 3.60	20 13 1.2	0.3	1.3	0.09
17	12 18	8 4 44.41	19 58 38.8	0.3	1.3	0.09	4	9 13	7 59 59.05	20 13 15.4	0.3	1.3	0.09
18	12 14	8 4 37.38	19 59 0.4	0.3	1.3	0.09	5	9 9	7 59 54.61	20 13 29.3	0.3	1.3	0.09
19	12 10	8 4 30.34	19 59 21.9	0.3	1.3	0.09	6	9 5	7 59 50.28	20 13 42.9	0.3	1.3	0.09
20	12 6	8 4 23.30	+19 59 43.5	0.3	1.3	0.09	7	9 1	7 59 46.06	+20 13 56.2	0.3	1.3	0.09
21	12 2	8 4 16.27	20 0 5.1	0.3	1.3	0.09	8	8 57	7 59 41.95	20 14 9.2	0.3	1.3	0.09
22	11 58	8 4 9.24	20 0 26.6	0.3	1.3	0.09	9	8 53	7 59 37.96	20 14 21.8	0.3	1.3	0.09
23	11 54	8 4 2.22	20 0 48.1	0.3	1.3	0.09	10	8 49	7 59 34.09	20 14 34.1	0.3	1.3	0.09
24	11 50	8 3 55.22	20 1 9.5	0.3	1.3	0.09	11	8 45	7 59 30.33	20 14 46.1	0.3	1.3	0.09
25	11 46	8 3 48.23	+20 1 30.9	0.3	1.3	0.09	12	8 41	7 59 26.69	+20 14 57.8	0.3	1.3	0.09
26	11 42	8 3 41.25	20 1 52.2	0.3	1.3	0.09	13	8 37	7 59 23.17	20 15 9.1	0.3	1.3	0.09
27	11 38	8 3 34.29	20 2 13.5	0.3	1.3	0.09	14	8 33	7 59 19.77	20 15 20.1	0.3	1.3	0.09
28	11 34	8 3 27.36	20 2 34.7	0.3	1.3	0.09	15	8 29	7 59 16.49	20 15 30.7	0.3	1.3	0.09
29	11 30	8 3 20.45	20 2 55.8	0.3	1.3	0.09	16	8 25	7 59 13.34	20 15 41.0	0.3	1.3	0.09
30	11 26	8 3 13.56	+20 3 16.9	0.3	1.3	0.09	17	8 21	7 59 10.31	+20 15 50.9	0.3	1.3	0.09
31	11 22	8 3 6.71	20 3 37.8	0.3	1.3	0.09	18	8 17	7 59 7.41	20 16 0.4	0.3	1.3	0.09
eb. 1	11 18	8 2 59.89	20 3 58.7	0.3	1.3	0.09	19	8 13	7 59 4.64	20 16 9.6	0.3	1.3	0.09
2	11 14	8 2 53.11	20 4 19.5	0.3	1.3	0.09	20	8 9	7 59 2.00	20 16 18.4	0.3	1.3	0.09
3	11 10	8 2 46.37	20 4 40.1	0.3	1.3	0.09	21	8 5	7 58 59.49	20 16 26.9	0.3	1.3	0.09
4	11 6	8 2 39.66	+20 5 0.6	0.3	1.3	0.09	22	8 1	7 58 57.12	+20 16 35.0	0.3	1.3	0.09
5	11 2	8 2 33.00	20 5 21.0	0.3	1.3	0.09	23	7 57	7 58 54.87	20 16 42.7	0.3	1.3	0.09
6	10 58	8 2 26.39	20 5 41.2	0.3	1.3	0.09	24	7 53	7 58 52.75	20 16 50.0	0.3	1.3	0.09
7	10 54	8 2 19.82	20 6 1.3	0.3	1.3	0.09	25	7 49	7 58 50.77	20 16 57.0	0.3	1.3	0.09
8	10 50	8 2 13.31	20 6 21.2	0.3	1.3	0.09	26	7 45	7 58 48.92	20 17 3.6	0.3	1.3	0.09
9	10 46	8 2 6.85	+20 6 41.0	0.3	1.3	0.09	27	7 41	7 58 47.21	+20 17 9.8	0.3	1.3	0.09
10	10 41	8 2 0.45	20 7 0.6	0.3	1.3	0.09	28	7 37	7 58 45.63	20 17 15.6	0.3	1.3	0.09
11	10 37	8 1 54.10	20 7 20.0	0.3	1.3	0.09	29	7 33	7 58 44.18	20 17 21.1	0.3	1.3	0.09
12	10 33	8 1 47.82	20 7 39.3	0.3	1.3	0.09	30	7 29	7 58 42.87	20 17 26.2	0.3	1.3	0.09
13	10 29	8 1 41.60	20 7 58.4	0.3	1.3	0.09	31	7 25	7 58 41.70	20 17 30.9	0.3	1.3	0.09
14	10 25	8 1 35.45	+20 8 17.3	0.3	1.3	0.09	Apr. 1	7 21	7 58 40.66	+20 17 35.2	0.3	1.3	0.09
15	10 21	8 1 29.37	+20 8 35.9	0.3	1.3	0.09	2	7 18	7 58 39.76	+20 17 39.1	0.3	1.3	0.09

Stellar magnitude at opposition, in January, 1915, 7.7.

NEPTUNE, 1915.

FOR TRANSIT AT WASHINGTON.

Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.	Date.	Mean Time of Transit.	Apparent Right Ascension.	Apparent Declination.	Hor. Par.	Semidiam.	S.T. of Sem. Pass. Mer.
	h m	h m s	° ′ ″	″	″	s		h m	h m s	° ′ ″	″	″	s
Apr. 1	7 21	7 58 40.66	+20 17 35.2	0.3	1.3	0.09	Nov. 16	16 38	8 19 22.83	+19 16 36.9	0.3	1.3	0.09
2	7 18	7 58 39.76	20 17 39.1	0.3	1.3	0.09	17	16 34	8 19 21.18	19 16 42.4	0.3	1.3	0.09
3	7 14	7 58 39.00	20 17 42.6	0.3	1.3	0.09	18	16 30	8 19 19.40	19 16 48.3	0.3	1.3	0.09
4	7 10	7 58 38.38	20 17 45.8	0.3	1.3	0.09	19	16 26	8 19 17.48	19 16 54.7	0.3	1.3	0.09
5	7 6	7 58 37.89	20 17 48.5	0.3	1.3	0.09	20	16 22	8 19 15.42	19 17 1.6	0.3	1.3	0.09
6	7 2	7 58 37.54	+20 17 50.9	0.3	1.3	0.09	21	16 18	8 19 13.23	+19 17 8.9	0.3	1.3	0.09
7	6 58	7 58 37.33	20 17 52.9	0.3	1.3	0.09	22	16 14	8 19 10.91	19 17 16.6	0.3	1.3	0.09
8	6 54	7 58 37.26	20 17 54.5	0.3	1.3	0.09	23	16 10	8 19 8.46	19 17 24.8	0.3	1.3	0.09
9	6 50	7 58 37.33	20 17 55.7	0.3	1.3	0.09	24	16 6	8 19 5.88	19 17 33.4	0.3	1.3	0.09
10	6 46	7 58 37.54	20 17 56.5	0.3	1.3	0.09	25	16 2	8 19 3.18	19 17 42.4	0.3	1.3	0.09
11	6 42	7 58 37.89	+20 17 56.9	0.3	1.3	0.09	26	15 58	8 19 0.35	+19 17 51.9	0.3	1.3	0.09
12	6 38	7 58 38.38	20 17 56.9	0.3	1.3	0.09	27	15 54	8 18 57.39	19 18 1.8	0.3	1.3	0.09
13	6 34	7 58 39.01	20 17 56.5	0.3	1.3	0.09	28	15 50	8 18 54.30	19 18 12.1	0.3	1.3	0.09
14	6 30	7 58 39.78	20 17 55.7	0.3	1.3	0.09	29	15 46	8 18 51.09	19 18 22.8	0.3	1.3	0.09
15	6 26	7 58 40.68	20 17 54.5	0.3	1.3	0.09	30	15 42	8 18 47.75	19 18 33.9	0.3	1.3	0.09
16	6 22	7 58 41.73	+20 17 52.9	0.3	1.3	0.09	Dec. 1	15 38	8 18 44.29	+19 18 45.4	0.3	1.3	0.09
17	6 18	7 58 42.92	20 17 50.9	0.3	1.3	0.09	2	15 34	8 18 40.71	19 18 57.3	0.3	1.3	0.09
18	6 15	7 58 44.25	20 17 48.5	0.3	1.3	0.09	3	15 30	8 18 37.00	19 19 9.6	0.3	1.3	0.09
19	6 11	7 58 45.72	20 17 45.7	0.3	1.3	0.09	4	15 26	8 18 33.18	19 19 22.3	0.3	1.3	0.09
20	6 7	7 58 47.32	20 17 42.6	0.3	1.3	0.09	5	15 22	8 18 29.24	19 19 35.4	0.3	1.3	0.09
Oct. 21	18 20	8 19 17.01	+19 16 56.0	0.3	1.3	0.09	6	15 18	8 18 25.19	+19 19 48.9	0.3	1.3	0.09
22	18 16	8 19 18.98	19 16 49.5	0.3	1.3	0.09	7	15 14	8 18 21.03	19 20 2.8	0.3	1.3	0.09
23	18 12	8 19 20.81	19 16 43.4	0.3	1.3	0.09	8	15 10	8 18 16.75	19 20 17.0	0.3	1.3	0.09
24	18 9	8 19 22.50	19 16 37.8	0.3	1.3	0.09	9	15 6	8 18 12.36	19 20 31.6	0.3	1.3	0.09
25	18 5	8 19 24.06	19 16 32.7	0.3	1.3	0.09	10	15 2	8 18 7.86	19 20 46.5	0.3	1.3	0.09
26	18 1	8 19 25.47	+19 16 28.0	0.3	1.3	0.09	11	14 58	8 18 3.26	+19 21 1.8	0.3	1.3	0.09
27	17 57	8 19 26.75	19 16 23.8	0.3	1.3	0.09	12	14 54	8 17 58.55	19 21 17.5	0.3	1.3	0.09
28	17 53	8 19 27.88	19 16 20.0	0.3	1.3	0.09	13	14 50	8 17 53.74	19 21 33.5	0.3	1.3	0.09
29	17 49	8 19 28.88	19 16 16.7	0.3	1.3	0.09	14	14 46	8 17 48.83	19 21 49.8	0.3	1.3	0.09
30	17 45	8 19 29.73	19 16 13.9	0.3	1.3	0.09	15	14 42	8 17 43.82	19 22 6.4	0.3	1.3	0.09
31	17 41	8 19 30.45	+19 16 11.5	0.3	1.3	0.09	16	14 38	8 17 38.71	+19 22 23.3	0.3	1.3	0.09
Nov. 1	17 37	8 19 31.02	19 16 9.6	0.3	1.3	0.09	17	14 34	8 17 33.51	19 22 40.6	0.3	1.3	0.09
2	17 33	8 19 31.46	19 16 8.2	0.3	1.3	0.09	18	14 30	8 17 28.22	19 22 58.2	0.3	1.3	0.09
3	17 29	8 19 31.76	19 16 7.2	0.3	1.3	0.09	19	14 26	8 17 22.84	19 23 16.1	0.3	1.3	0.09
4	17 25	8 19 31.91	19 16 6.7	0.3	1.3	0.09	20	14 22	8 17 17.37	19 23 34.2	0.3	1.3	0.09
5	17 21	8 19 31.92	+19 16 6.7	0.3	1.3	0.09	21	14 18	8 17 11.81	+19 23 52.6	0.3	1.3	0.09
6	17 17	8 19 31.79	19 16 7.1	0.3	1.3	0.09	22	14 14	8 17 6.17	19 24 11.3	0.3	1.3	0.09
7	17 13	8 19 31.52	19 16 8.0	0.3	1.3	0.09	23	14 10	8 17 0.45	19 24 30.3	0.3	1.3	0.09
8	17 9	8 19 31.11	19 16 9.4	0.3	1.3	0.09	24	14 6	8 16 54.65	19 24 49.5	0.3	1.3	0.09
9	17 6	8 19 30.56	19 16 11.2	0.3	1.3	0.09	25	14 2	8 16 48.77	19 25 8.9	0.3	1.3	0.09
10	17 2	8 19 29.87	+19 16 13.5	0.3	1.3	0.09	26	13 58	8 16 42.82	+19 25 28.6	0.3	1.3	0.09
11	16 58	8 19 29.04	19 16 16.3	0.3	1.3	0.09	27	13 54	8 16 36.80	19 25 48.5	0.3	1.3	0.09
12	16 54	8 19 28.07	19 16 19.5	0.3	1.3	0.09	28	13 50	8 16 30.71	19 26 8.6	0.3	1.3	0.09
13	16 50	8 19 26.96	19 16 23.2	0.3	1.3	0.09	29	13 46	8 16 24.54	19 26 29.0	0.3	1.3	0.09
14	16 46	8 19 25.72	19 16 27.3	0.3	1.3	0.09	30	13 42	8 16 18.30	19 26 49.6	0.3	1.3	0.09
15	16 42	8 19 24.34	+19 16 31.9	0.3	1.3	0.09	31	13 38	8 16 12.01	+19 27 10.4	0.3	1.3	0.09
16	16 38	8 19 22.83	+19 16 36.9	0.3	1.3	0.09	32	13 34	8 16 5.67	+19 27 31.3	0.3	1.3	0.09

Stellar magnitude at opposition, in January, 1916, 7.7.

PART III.

PHENOMENA.

In the year 1915 there will be two eclipses, both of the sun.

I.—*An Annular Eclipse of the Sun*, 1915, February 13, invisible at Washington

ELEMENTS OF THE ECLIPSE.

	d	h	m	s
Greenwich mean time of ☌ in right ascension, February	13	16	22	35.0

	h	m	s			s	s	
Sun and Moon's R. A.	21	46	49.92		Hourly motions	9.80 and	124.66	
	°	′	″			′	″	
Sun's declination	13	23	39.8	S.	Hourly motion	0	50.4	N.
Moon's declination	13	36	27.3	S.	Hourly motion	13	56.2	N.
Sun's equa. hor. parallax			8.9		Sun's true semidiameter	16	11.7	
Moon's equa. hor. parallax		57	16.8		Moon's true semidiameter	15	35.8	

CIRCUMSTANCES OF THE ECLIPSE.

		Greenwich Mean Time.			Longitude from Greenwich.			Latitude.		
		d	h	m	°	′		°	′	
Eclipse begins	Feb.	13	13	41.7	59	40.8	E.	31	45.3	S.
Central eclipse begins		13	14	44.4	42	35.1	E.	35	49.7	S.
Central eclipse at local apparent noon		13	16	22.6	117	57.1	E.	26	29.7	S.
Central eclipse ends		13	18	22.0	174	53.8	E.	13	9.8	N.
Eclipse ends		13	19	24.8	158	9.3	E.	17	17.4	N.

II.—*An Annular Eclipse of the Sun*, 1915, August 10, invisible at Washington.

ELEMENTS OF THE ECLIPSE.

	d	h	m	s
Greenwich mean time of ☌ in right ascension, August	10	10	51	37.5

	h	m	s			s	s	
Sun and Moon's R. A.	9	18	36.62		Hourly motions	9.50 and	122.69	
	°	′	″			′	″	
Sun's declination	15	41	17.3	N.	Hourly motion	0	43.7	S.
Moon's declination	15	42	1.1	N.	Hourly motion	12	29.7	S.
Sun's equa. hor. parallax			8.7		Sun's true semidiameter	15	46.8	
Moon's equa. hor. parallax		56	10.4		Moon's true semidiameter	15	17.7	

CIRCUMSTANCES OF THE ECLIPSE.

		Greenwich Mean Time.			Longitude from Greenwich.			Latitude.		
		d	h	m	°	′		°	′	
Eclipse begins	Aug.	10	7	56.1	145	27.3	E.	22	57.5	N.
Central eclipse begins		10	8	59.0	129	39.2	E.	23	12.3	N.
Central eclipse at local apparent noon		10	10	51.6	161	35.0	W.	16	32.4	N.
Central eclipse ends		10	12	45.4	106	31.3	W.	21	55.9	S.
Eclipse ends		10	13	48.2	122	17.9	W.	22	10.7	S.

The regions within which the eclipses of the Sun are visible are laid down on the accompanying charts, from which, by means of the dotted lines, the Greenwich mean times of beginning and ending at any place may be found with an uncertainty which will vary from three or four minutes for a high Sun to fifteen or twenty minutes when the Sun is near the horizon.

ESSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN, 1915, FEBRUARY 13.

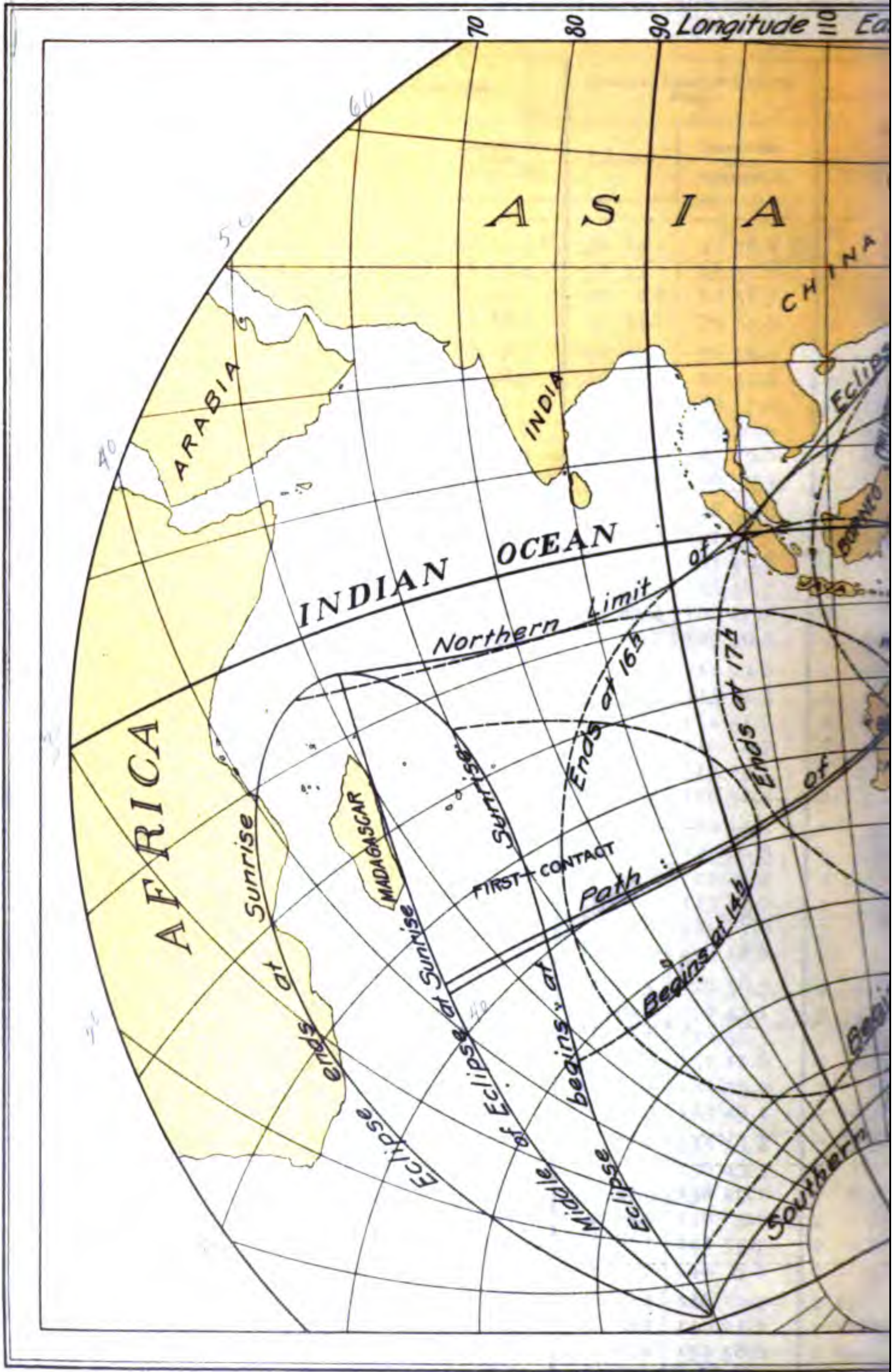
reenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	y	Log sin d	Log cos d	μ	l_1	l_2
h m					° ′		
13 40	−1.32400	−0.84413	−9.36598	+9.98796	201 23.9	+0.55604	+0.01007
50	1.24256	0.80602	9.36591	9.98796	203 53.9	0.55607	0.01010
14 0	−1.16111	−0.76791	−9.36584	+9.98797	206 24.0	+0.55610	+0.01013
10	1.07967	0.72979	9.36576	9.98797	208 54.0	0.55613	0.01016
20	0.99823	0.69167	9.36569	9.98797	211 24.0	0.55616	0.01019
30	0.91679	0.65354	9.36562	9.98798	213 54.0	0.55619	0.01022
40	0.83535	0.61541	9.36555	9.98798	216 24.0	0.55621	0.01024
50	0.75391	0.57727	9.36548	9.98799	218 54.0	0.55624	0.01027
15 0	−0.67247	−0.53912	−9.36541	+9.98799	221 24.0	+0.55627	+0.01030
10	0.59103	0.50097	9.36534	9.98799	223 54.1	0.55629	0.01032
20	0.50960	0.46282	9.36527	9.98800	226 24.1	0.55632	0.01035
30	0.42816	0.42465	9.36519	9.98800	228 54.1	0.55634	0.01037
40	0.34673	0.38649	9.36512	9.98801	231 24.1	0.55636	0.01039
50	0.26530	0.34832	9.36505	9.98801	233 54.1	0.55639	0.01042
16 0	−0.18388	−0.31014	−9.36498	+9.98801	236 24.1	+0.55641	+0.01044
10	0.10245	0.27196	9.36491	9.98802	238 54.2	0.55643	0.01046
20	−0.02103	0.23377	9.36484	9.98802	241 24.2	0.55645	0.01048
30	+0.06039	0.19558	9.36477	9.98803	243 54.2	0.55647	0.01050
40	0.14180	0.15739	9.36470	9.98803	246 24.2	0.55649	0.01052
50	0.22321	0.11919	9.36462	9.98804	248 54.2	0.55651	0.01054
17 0	+0.30462	−0.08098	−9.36455	+9.98804	251 24.2	+0.55653	+0.01056
10	0.38603	0.04277	9.36448	9.98804	253 54.2	0.55655	0.01058
20	0.46743	−0.00456	9.36441	9.98805	256 24.3	0.55656	0.01059
30	0.54882	+0.03366	9.36434	9.98805	258 54.3	0.55658	0.01061
40	0.63022	0.07188	9.36427	9.98806	261 24.3	0.55660	0.01063
50	0.71160	0.11010	9.36420	9.98806	263 54.3	0.55661	0.01064
18 0	+0.79299	+0.14833	−9.36412	+9.98806	266 24.3	+0.55663	+0.01065
10	0.87437	0.18656	9.36405	9.98807	268 54.3	0.55664	0.01067
20	0.95574	0.22480	9.36398	9.98807	271 24.3	0.55665	0.01068
30	1.03711	0.26304	9.36391	9.98808	273 54.4	0.55667	0.01070
40	1.11847	0.30128	9.36384	9.98808	276 24.4	0.55668	0.01071
50	1.19983	0.33953	9.36377	9.98808	278 54.4	0.55669	0.01072
19 0	+1.28118	+0.37778	−9.36369	+9.98809	281 24.4	+0.55670	+0.01073
10	1.36253	0.41604	9.36362	9.98809	283 54.4	0.55671	0.01074
20	1.44387	0.45429	9.36355	9.98810	286 24.4	0.55672	0.01075
30	+1.52520	+0.49255	−9.36348	+9.98810	288 54.4	+0.55673	+0.01076

reenwich Mean Time.	Log x' for 1 Minute.	Log y' for 1 Minute.	Log μ' for 1 Minute.	Log Tangents of Angles of Cones.	
				Penumbra.	Shadow.
h m					
13 0	+7.9108	+7.5806	+1.1761	+7.67532	+7.67315
14 0	7.9108	7.5811	1.1761	7.67531	7.67315
15 0	7.9108	7.5815	1.1761	7.67531	7.67314
16 0	7.9108	7.5818	1.1761	7.67531	7.67314
17 0	7.9107	7.5821	1.1761	7.67531	7.67314
18 0	7.9105	7.5824	1.1761	7.67530	7.67313
19 0	7.9103	7.5827	1.1761	7.67530	7.67313
20 0	+7.9101	+7.5829	+1.1761	+7.67530	+7.67313

PATH OF THE ANNULUS DURING THE ANNULAR ECLIPSE OF THE SUN, 1915, FEBRUARY 13.

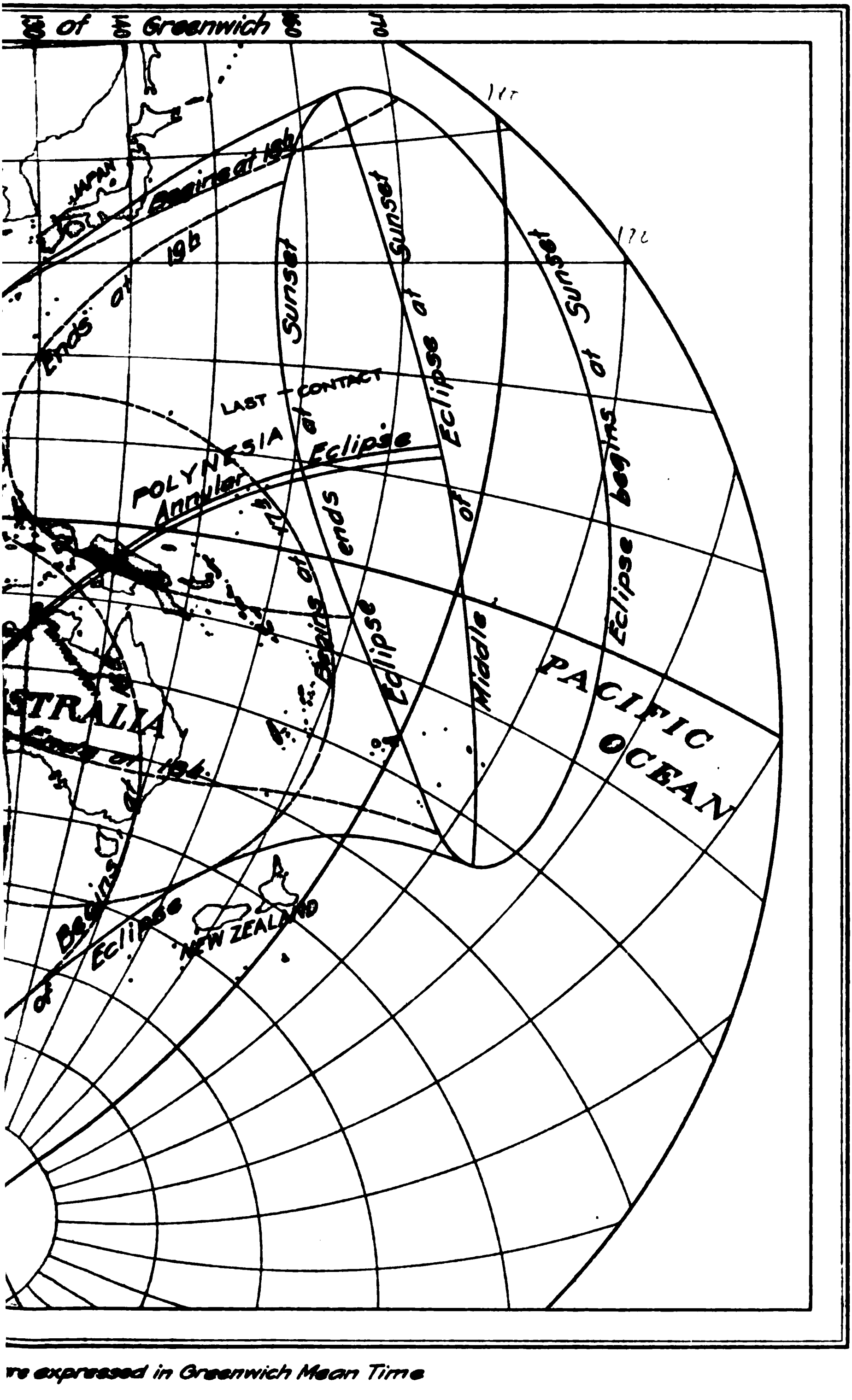
Greenwich Mean Time	Northern Limit of Annulus Path.		Central Line.		Southern Limit of Annulus Path.		Duration of Annulus on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits.	−35 15·3	42 53·0 E.	−35 49·7	42 35·1 E.	−36 24·2	42 16·8 E.	. . .
14h 45m	37 8·9	51 23·7	37 23·0	49 33·4	37 27·1	46 55·8	2 12·7
50	39 4·7	64 9·0	39 32·7	63 35·1	40 0·8	62 58·7	2 11·9
55	39 36·9	71 35·1	40 5·5	71 16·0	40 34·1	70 55·9	2 11·4
15 0	−39 41·2	77 18·4	−40 9·2	77 7·5	−40 37·3	76 56·0	2 10·9
5	39 29·6	82 3·8	39 56·8	81 58·4	40 24·0	81 52·6	2 10·4
10	39 7·3	86 9·9	39 33·5	86 8·6	39 59·7	86 7·0	2 10·0
15	38 37·1	89 47·0	39 2·2	89 48·8	39 27·4	89 50·4	2 9·5
20	38 0·8	93 1·2	38 24·9	93 5·5	38 49·1	93 9·6	2 9·1
25	37 19·5	95 56·9	37 42·6	96 3·1	38 5·8	96 9·3	2 8·6
30	−36 34·2	98 37·2	−36 56·4	98 45·0	−37 18·7	98 52·9	2 8·1
35	35 45·6	101 4·3	36 6·9	101 13·5	36 28·3	101 22·7	2 7·7
40	34 53·9	103 20·1	35 14·4	103 30·5	35 35·0	103 40·8	2 7·2
45	33 59·8	105 26·2	34 19·5	105 37·4	34 39·3	105 48·7	2 6·8
50	33 3·4	107 23·6	33 22·4	107 35·7	33 41·4	107 47·7	2 6·3
55	32 5·0	109 13·6	32 23·3	109 26·3	32 41·7	109 39·0	2 5·9
16 0	−31 4·8	110 57·0	−31 22·5	111 10·3	−31 40·3	111 23·6	2 5·5
5	30 3·0	112 34·7	30 20·2	112 48·5	30 37·3	113 2·3	2 5·1
10	28 59·7	114 7·3	29 16·3	114 21·5	29 33·0	114 35·7	2 4·8
15	27 55·0	115 35·4	28 11·1	115 50·0	28 27·3	116 4·7	2 4·5
20	26 48·9	116 59·7	27 4·6	117 14·7	27 20·3	117 29·7	2 4·2
25	25 41·5	118 20·7	25 56·8	118 36·0	26 12·2	118 51·4	2 4·0
30	−24 32·9	119 38·9	−24 47·8	119 54·5	−25 2·9	120 10·2	2 3·9
35	23 23·0	120 54·8	23 37·7	121 10·7	23 52·4	121 26·8	2 3·8
40	22 11·9	122 8·8	22 26·3	122 25·0	22 40·8	122 41·4	2 3·7
45	20 59·6	123 21·4	21 13·8	123 38·0	21 28·0	123 54·6	2 3·7
50	19 46·0	124 33·0	20 0·0	124 49·9	20 14·1	125 7·0	2 3·8
55	18 31·1	125 44·2	18 45·0	126 1·4	18 58·9	126 18·8	2 3·9
17 0	−17 14·9	126 55·3	−17 28·7	127 12·9	−17 42·5	127 30·7	2 4·1
5	15 57·3	128 6·8	16 11·0	128 24·8	16 24·8	128 43·1	2 4·4
10	14 38·1	129 19·4	14 51·8	129 37·8	15 5·6	129 56·5	2 4·7
15	13 17·3	130 33·5	13 31·1	130 52·4	13 44·9	131 11·6	2 5·1
20	11 54·8	131 49·8	12 8·6	132 9·3	12 22·5	132 29·0	2 5·6
25	10 30·4	133 9·0	10 44·3	133 29·1	10 58·3	133 49·4	2 6·1
30	− 9 3·9	134 32·0	− 9 17·9	134 52·8	− 9 32·0	135 13·8	2 6·7
35	7 34·9	135 59·9	7 49·1	136 21·5	8 3·5	136 43·3	2 7·4
40	6 3·2	137 33·9	6 17·7	137 56·4	6 32·3	138 19·1	2 8·1
45	4 28·3	139 15·8	4 43·1	139 39·4	4 58·0	140 3·2	2 8·9
50	2 49·8	141 7·8	3 4·9	141 32·6	3 20·1	141 57·7	2 9·8
55	− 1 6·6	143 12·8	− 1 22·1	143 39·2	− 1 37·7	144 5·8	2 10·7
18 0	+ 0 42·4	145 35·4	+ 0 26·5	146 3·8	+ 0 10·4	146 32·4	2 11·7
5	2 39·0	148 22·8	2 22·7	148 53·8	2 6·1	149 25·2	2 12·8
10	4 46·8	151 48·0	4 30·0	152 23·0	4 13·1	152 58·6	2 14·0
15	7 12·8	156 19·2	6 56·0	157 1·7	6 39·2	157 45·2	2 15·4
20	10 22·1	163 35·6	10 8·6	164 43·0	9 55·9	165 56·6	2 17·1
Limits.	+13 46·2	174 39·3 E.	+13 9·8	174 53·8 E.	+12 33·3	175 8·5 E.	. . .

ANNULAR ECLIPSE O



Note:- The hours of beginning and en

FEBRUARY 13TH 1915.



re expressed in Greenwich Mean Time

SSELIAN ELEMENTS OF THE ANNULAR ECLIPSE OF THE SUN, 1915, AUGUST 10.

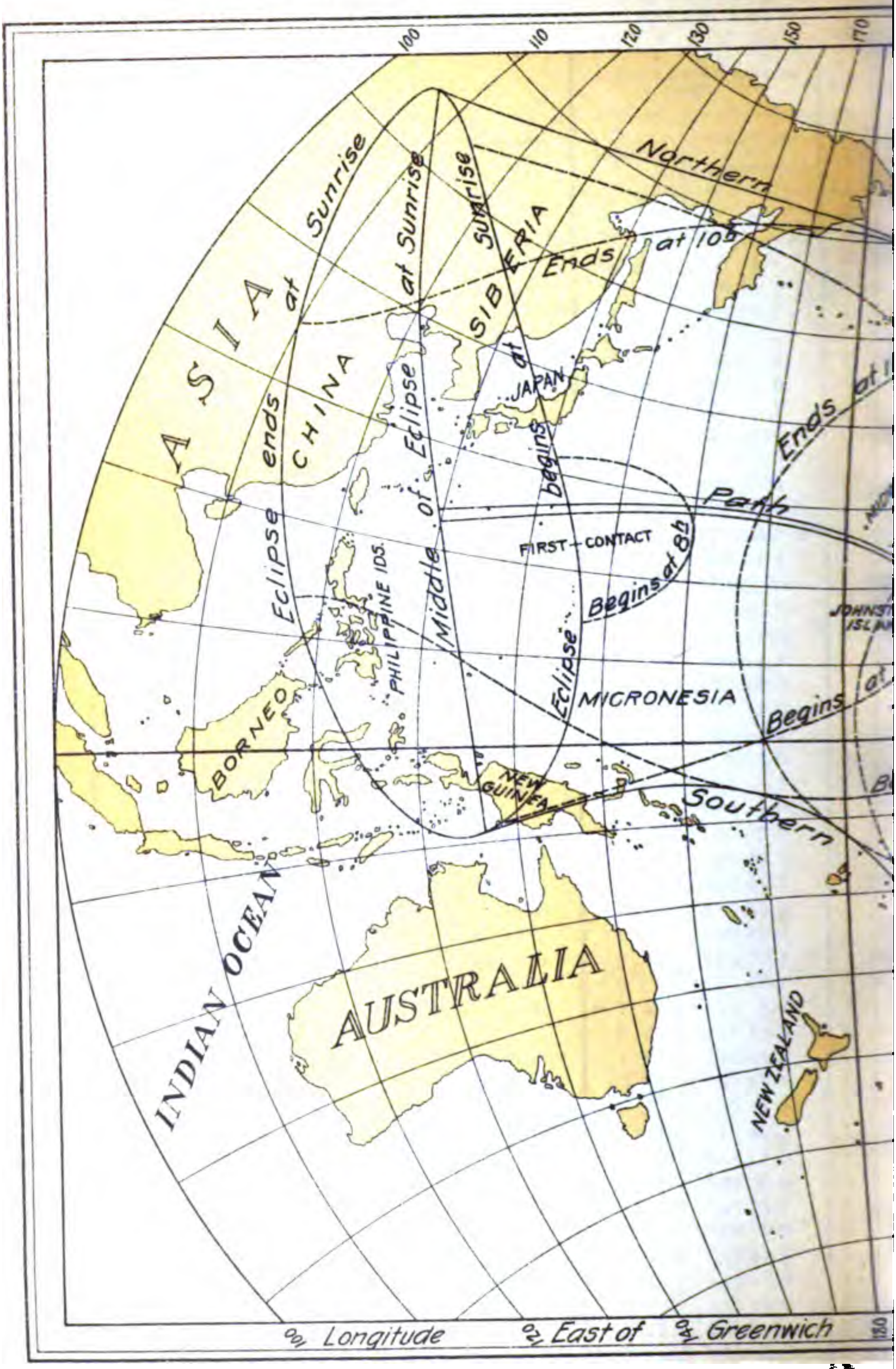
eenwich Mean Time.	Coordinates of Center of Shadow on Fundamental Plane.		Direction of Axis of Shadow.			Radius of Penumbra and Shadow on Fundamental Plane.	
	x	*y*	Log sin *d*	Log cos *d*	*μ*	*l*₁	*l*₂
h m					° ′		
7 50	−1.47199	+0.64791	+9.43296	+9.98344	116 10.2	+0.55487	+0.00891
8 0	−1.39095	+0.61301	+9.43290	+9.98344	118 40.2	+0.55486	+0.00890
10	1.30991	0.57810	9.43285	9.98345	121 10.2	0.55485	0.00889
20	1.22886	0.54319	9.43280	9.98345	123 40.2	0.55484	0.00888
30	1.14782	0.50826	9.43275	9.98345	126 10.3	0.55484	0.00887
40	1.06677	0.47333	9.43269	9.98346	128 40.3	0.55482	0.00886
50	0.98573	0.43840	9.43264	9.98346	131 10.3	0.55481	0.00885
9 0	−0.90468	+0.40346	+9.43259	+9.98347	133 40.3	+0.55480	+0.00884
10	0.82363	0.36851	9.43254	9.98347	136 10.4	0.55479	0.00883
20	0.74259	0.33356	9.43249	9.98347	138 40.4	0.55478	0.00882
30	0.66154	0.29860	9.43243	9.98348	141 10.4	0.55477	0.00881
40	0.58049	0.26363	9.43238	9.98348	143 40.5	0.55475	0.00879
50	0.49944	0.22866	9.43233	9.98349	146 10.5	0.55474	0.00878
10 0	−0.41839	+0.19368	+9.43228	+9.98349	148 40.5	+0.55472	+0.00876
10	0.33735	0.15870	9.43223	9.98350	151 10.5	0.55471	0.00875
20	0.25630	0.12372	9.43217	9.98350	153 40.6	0.55469	0.00873
30	0.17526	0.08872	9.43212	9.98350	156 10.6	0.55468	0.00872
40	0.09421	0.05372	9.43207	9.98351	158 40.6	0.55466	0.00870
50	−0.01317	+0.01872	9.43202	9.98351	161 10.6	0.55464	0.00868
11 0	+0.06787	−0.01629	+9.43196	+9.98352	163 40.7	+0.55462	+0.00866
10	0.14892	0.05130	9.43191	9.98352	166 10.7	0.55460	0.00864
20	0.22995	0.08632	9.43186	9.98352	168 40.7	0.55458	0.00862
30	0.31099	0.12135	9.43181	9.98353	171 10.8	0.55456	0.00860
40	0.39203	0.15638	9.43175	9.98353	173 40.8	0.55454	0.00858
50	0.47306	0.19141	9.43170	9.98354	176 10.8	0.55452	0.00856
12 0	+0.55409	−0.22645	+9.43165	+9.98354	178 40.8	+0.55450	+0.00854
10	0.63512	0.26149	9.43160	9.98354	181 10.9	0.55448	0.00852
20	0.71614	0.29654	9.43154	9.98355	183 40.9	0.55445	0.00849
30	0.79717	0.33159	9.43149	9.98355	186 10.9	0.55443	0.00847
40	0.87819	0.36665	9.43144	9.98356	188 40.9	0.55441	0.00845
50	0.95920	0.40171	9.43139	9.98356	191 11.0	0.55438	0.00842
13 0	+1.04022	−0.43678	+9.43134	+9.98357	193 41.0	+0.55436	+0.00840
10	1.12123	0.47185	9.43128	9.98357	196 11.0	0.55433	0.00837
20	1.20223	0.50692	9.43123	9.98357	198 41.0	0.55430	0.00835
30	1.28323	0.54200	9.43118	9.98358	201 11.1	0.55428	0.00832
40	1.36423	0.57708	9.43113	9.98358	203 41.1	0.55425	0.00829
50	+1.44523	−0.61216	+9.43107	+9.98359	206 11.1	+0.55422	+0.00826

eenwich Mean Time.	Log *x*′ for 1 Minute.	Log *y*′ for 1 Minute.	Log *μ*′ for 1 Minute.	Log Tangents of Angles of Cones.	
				Penumbra.	Shadow.
h m					
7 0	+7.9086	−7.5424	+1.1762	+7.66403	+7.66186
8 0	7.9087	7.5429	1.1762	7.66403	7.66186
9 0	7.9087	7.5434	1.1762	7.66403	7.66186
10 0	7.9087	7.5438	1.1762	7.66404	7.66187
11 0	7.9087	7.5442	1.1762	7.66404	7.66187
12 0	7.9086	7.5446	1.1762	7.66404	7.66187
13 0	7.9085	7.5449	1.1762	7.66404	7.66188
14 0	+7.9084	−7.5452	+1.1762	+7.66405	+7.66188

PATH OF THE ANNULUS DURING THE ANNULAR ECLIPSE OF THE SUN, 1915, AUGUST 10.

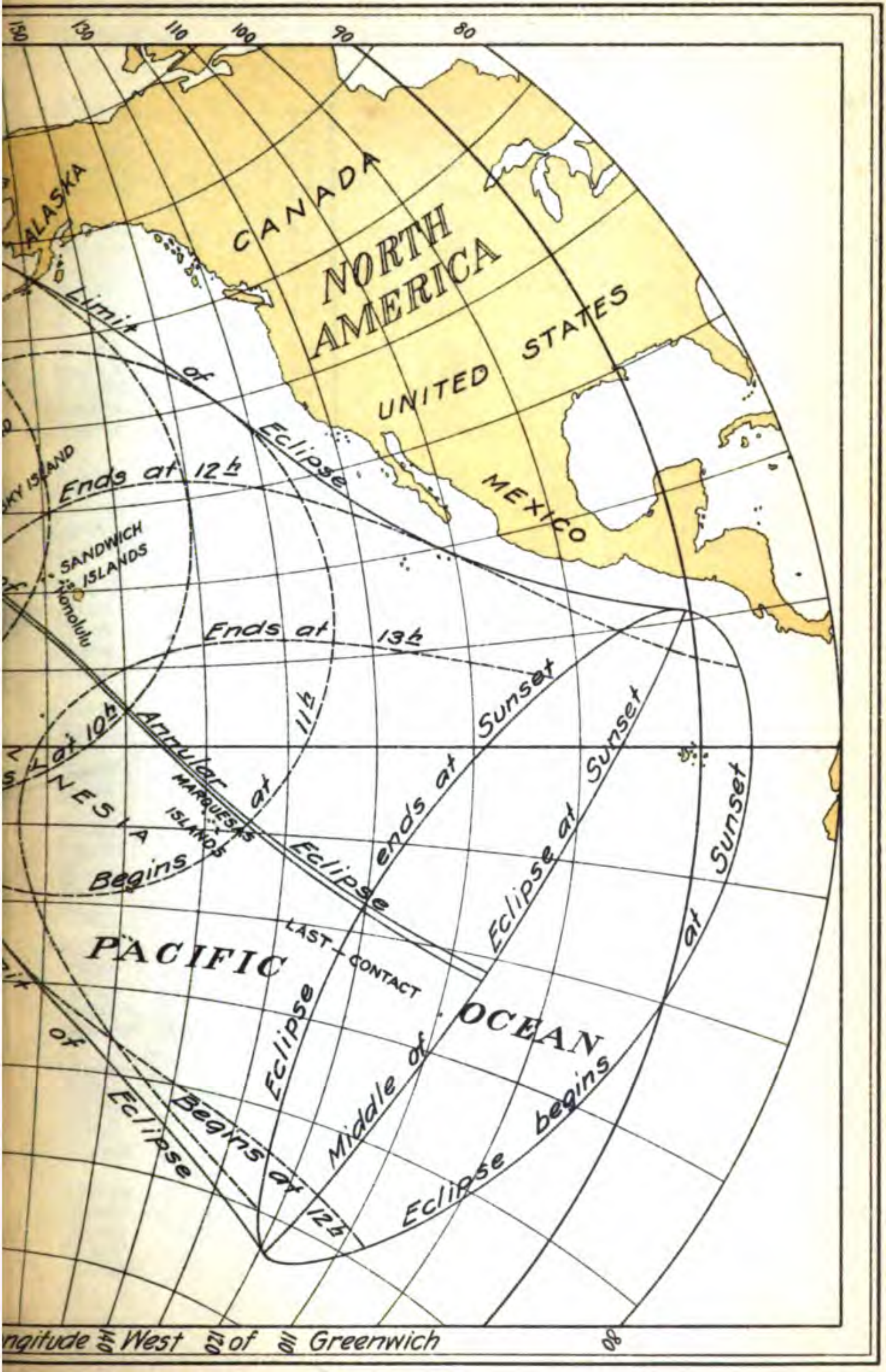
Greenwich Mean Time	Northern Limit of Annulus Path.		Central Line.		Southern Limit of Annulus Path.		Duration of Annulus on Central Line.
	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	Latitude.	Longitude from Greenwich.	
	° ′	° ′	° ′	° ′	° ′	° ′	m s
Limits.	+23 41.3	129 27.2 E.	+23 12.3	129 39.2 E.	+22 43.4	129 51.1 E.	. .
9h 0m	25 36.6	136 50.5	25 16.2	137 29.2	24 55.0	138 4.2	1 57.
5	27 51.7	148 9.8	27 27.7	148 22.3	27 3.7	148 34.3	1 55.
10	28 40.2	154 33.7	28 16.9	154 40.0	27 53.7	154 46.3	1 54.
15	29 0.8	159 27.1	28 38.6	159 30.0	28 16.3	159 32.9	1 53.
20	29 5.6	163 30.8	28 44.3	163 31.2	28 23.1	163 31.7	1 51.
25	28 59.6	167 1.5	28 39.3	167 0.1	28 19.0	166 58.8	1 50.
30	+28 45.5	170 8.0	+28 26.2	170 5.1	+28 6.8	170 2.4	1 49.
35	28 25.2	172 55.9	28 6.7	172 51.8	27 48.1	172 47.9	1 48.
40	27 59.6	175 28.7	27 42.0	175 23.7	27 24.3	175 18.9	1 47.
45	27 29.7	177 49.0	27 12.8	177 43.3	26 55.9	177 37.6	1 45.
50	26 56.0	179 58.8 E.	26 39.8	179 52.4 E.	26 23.6	179 46.1 E.	1 44.
55	26 19.0	178 0.5 W.	26 3.5	178 7.4 W.	25 48.0	178 14.2 W.	1 43.
10 0	+25 39.0	176 7.6	+25 24.2	176 14.9	+25 9.3	176 22.3	1 42.
5	24 56.4	174 21.6	24 42.2	174 29.3	24 28.0	174 37.0	1 41.
10	24 11.5	172 41.6	23 57.8	172 49.7	23 44.1	172 57.7	1 40
15	23 24.3	171 6.9	23 11.2	171 15.3	22 58.0	171 23.6	1 39
20	22 35.1	169 37.0	22 22.5	169 45.6	22 9.8	169 54.1	1 38.
25	21 44.0	168 11.1	21 31.8	168 20.0	21 19.5	168 28.8	1 37.
30	+20 51.1	166 49.0	+20 39.3	166 58.0	+20 27.4	167 7.0	1 36.
35	19 56.4	165 30.0	19 45.0	165 39.2	19 33.5	165 48.4	1 35.5
40	19 0.1	164 13.8	18 49.0	164 23.2	18 37.8	164 32.6	1 34.5
45	18 2.2	163 0.0	17 51.3	163 9.6	17 40.4	163 19.1	1 34.1
50	17 2.6	161 48.2	16 52.0	161 57.9	16 41.4	162 7.6	1 33.5
55	16 1.5	160 38.0	15 51.1	160 47.9	15 40.7	160 57.8	1 33.0
11 0	+14 58.9	159 29.1	+14 48.7	159 39.2	+14 38.5	159 49.2	1 32.6
5	13 54.6	158 21.1	13 44.6	158 31.4	13 34.5	158 41.6	1 32.3
10	12 48.8	157 13.6	12 38.9	157 24.1	12 29.0	157 34.5	1 32.1
15	11 41.4	156 6.3	11 31.5	156 17.0	11 21.7	156 27.6	1 32.0
20	10 32.3	154 58.8	10 22.5	155 9.6	10 12.7	155 20.5	1 31.9
25	9 21.4	153 50.6	9 11.6	154 1.7	9 1.8	154 12.7	1 32.0
30	+ 8 8.7	152 41.3	+ 7 58.9	152 52.6	+ 7 49.1	153 3.9	1 32.2
35	6 54.0	151 30.4	6 44.1	151 42.0	6 34.3	151 53.6	1 32.5
40	5 37.2	150 17.3	5 27.3	150 29.3	5 17.4	150 41.2	1 32.9
45	4 18.2	149 1.4	4 8.1	149 13.8	3 58.1	149 26.1	1 33.4
50	2 56.7	147 42.0	2 46.5	147 54.7	2 36.3	148 7.4	1 34.
55	1 32.4	146 17.9	+ 1 22.0	146 31.1	+ 1 11.6	146 44.3	1 34.5
12 0	+ 0 5.1	144 48.2	− 0 5.5	145 2.0	− 0 16.2	145 15.6	1 35.6
5	− 1 25.7	143 11.5	1 36.7	143 25.8	1 47.6	143 40.0	1 36.6
10	3 0.6	141 25.8	3 11.9	141 40.8	3 23.3	141 55.7	1 37.6
15	4 40.4	139 28.6	4 52.2	139 44.3	5 3.9	140 0.0	1 38.8
20	6 26.2	137 16.2	6 38.5	137 32.9	6 50.7	137 49.5	1 40.2
25	8 19.6	134 43.2	8 32.5	135 1.0	8 45.4	135 18.8	1 41.7
30	−10 23.5	131 40.1	−10 37.2	131 59.5	−10 50.7	132 18.9	1 43.4
35	12 43.2	127 49.0	12 57.7	128 10.8	13 12.1	128 32.4	1 45.4
40	15 31.9	122 24.4	15 47.2	122 50.8	16 2.4	123 16.7	1 47.
45	20 16.2	110 21.0	20 24.0	111 28.6	20 33.9	112 26.8	1 52.
Limits.	−21 28.2	106 20.2 W.	−21 55.9	106 31.3 W.	−22 23.4	106 42.4 W.	. . .

ANNULAR ECLIPSE



Note:– The hours of beginning and endin

T AUGUST 10TH 1915.



re expressed in Greenwich Mean Time.

MEAN PLACES FOR 1915.0. (January 0^d.732, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
d Piscium . . .	5.4	0 16 13.390	+0.0003	+ 7 43 5.84	+0.016
1 Piscium . . .	5.6	0 28 0.570	+0.0021	6 29 10.36	+0.009
6 B. Piscium . . .	6.5	0 36 48.256	−0.0084	8 53 28.82	−0.082
5 Piscium . . .	6.3	1 2 5.198	+0.0012	12 30 2.93	+0.042
η Piscium . . .	3.7	1 26 55.924	+0.0015	14 54 28.83	−0.003
1 Piscium . . .	6.2	1 31 13.615	+0.0010	+14 13 38.20	−0.001
5 Piscium . . .	6.1	1 35 5.480	+0.0053	15 58 30.03	−0.006
3 Arietis . . .	6.4	1 41 58.256	+0.0031	16 59 15.36	+0.015
4 Arietis . . .	5.8	1 43 34.117	+0.0035	16 31 58.20	−0.021
ι Arietis . . .	5.1	1 52 42.233	+0.0021	17 24 10.70	−0.020
5 B. Arietis . . .	6.4	1 59 2.694	−0.0008	+17 50 42.79	−0.018
7 B. Arietis . . .	6.5	2 3 5.709	−0.0037	17 37 29.77	−0.007
0 H¹. Arietis . . .	6.4	2 4 42.760	+0.0112	16 49 34.07	−0.179
15 Arietis . . .	5.9	2 5 54.696	+0.0059	19 5 59.00	−0.032
θ Arietis . . .	5.6	2 13 23.670	−0.0007	19 30 30.57	−0.003
26 Arietis . . .	6.2	2 25 52.191	+0.0050	+19 28 43.17	−0.022
ν Arietis . . .	5.4	2 33 59.203	+0.0001	21 35 39.96	−0.021
μ Arietis . . .	5.7	2 37 34.221	+0.0023	19 38 59.97	−0.038
ε Arietis (*mean*) .	4.6	2 54 20.884	−0.0009	21 0 3.66	−0.010
64 Arietis . . .	5.8	3 19 17.092	+0.0013	24 25 25.65	−0.046
66 Arietis . . .	6.1	3 23 28.270	+0.0006	+22 30 42.33	−0.112
7 Tauri . . .	5.9	3 29 24.408	+0.0013	24 10 48.45	−0.023
11 Tauri . . .	6.1	3 35 41.512	+0.0014	25 3 19.68	−0.008
16 Tauri . . .	5.4	3 39 44.837	+0.0009	24 1 22.24	−0.049
17 Tauri . . .	3.8	3 39 49.48[illegible]	+0.0016	23 50 48.77	−0.050
18 Tauri . . .	5.6	3 40 5.203	+0.0004	+24 34 24.49	−0.038
q Tauri . . .	4.3	3 40 8.665	+0.0010	24 12 5.59	−0.034
20 Tauri . . .	4.1	3 40 45.945	+0.0016	24 6 10.70	−0.044
21 Tauri . . .	5.8	3 40 50.424	+0.0012	24 17 23.96	−0.046
22 Tauri . . .	6.5	3 40 58.866	+0.0006	24 15 48.72	−0.039
23 Tauri . . .	4.3	3 41 16.683	+0.0017	+23 41 3.48	−0.050
η Tauri . . .	3.0	3 42 25.719	+0.0016	23 50 35.18	−0.050
27 Tauri . . .	3.7	3 44 6.289	+0.0013	23 47 39.60	−0.048
28 Tauri . . .	5.2	3 44 7.575	+0.0009	23 52 40.23	−0.046
14 H. Tauri . . .	5.3	3 45 12.140	+0.0033	25 19 25.88	−0.103
p Tauri . . .	5.6	4 5 39.079	−0.0024	+26 15 35.98	−0.042
φ Tauri . . .	5.0	4 15 7.389	−0.0019	27 8 53.74	−0.082
χ Tauri . . .	5.3	4 17 24.460	+0.0028	25 25 46.42	−0.029
17 B. Aurigæ . . .	6.0	4 47 28.420	+0.0033	27 45 22.23	−0.037
38 B. Aurigæ . . .	6.5	4 59 18.940	−0.0001	27 34 41.41	−0.075
47 B. Aurigæ . . .	6.0	5 4 24.623	. . . .	+27 55 27.19	. . .
154 B. Tauri . . .	6.4	5 15 38.965	−0.0027	27 52 19.52	−0.015
22 Aurigæ . . .	6.4	5 17 59.796	+0.0017	28 51 24.17	−0.031
β Tauri . . .	1.8	5 20 55.053	+0.0025	28 32 12.08	−0.177
107 B. Aurigæ . . .	6.5	5 30 35.407	−0.0013	27 36 27.56	−0.076
112 B. Aurigæ . . .	5.7	5 31 50.228	−0.0004	+26 52 19.33	−0.039
125 Tauri . . .	5.1	5 34 28.117	+0.0018	25 51 1.39	−0.029
106 B. Tauri . . .	5.6	5 45 36.644	−0.0013	27 56 36.54	+0.011
136 Tauri . . .	4.6	5 47 59.110	+0.0013	27 35 35.22	−0.020
154 B. Aurigæ . . .	6.4	5 51 9.795	. . . .	+28 55 47.19	. . .

MEAN PLACES FOR 1915.0. (January 0^d.732, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
139 Tauri	4.7	5 52 43.196	0.0000	+25 56 39.68	−0.007
415 B. Tauri	6.1	5 55 40.056	+0.0018	27 34 7.97	−0.001
49 Aurigæ	5.1	6 29 50.914	−0.0001	28 5 22.19	−0.027
54 Aurigæ	5.8	6 34 11.539	−0.0012	28 20 20.84	−0.025
ε Geminorum	3.2	6 38 42.204	−0.0001	25 12 58.74	−0.018
37 Geminorum	5.7	6 50 5.102	−0.0028	+25 28 58.73	+0.014
39 Geminorum	6.2	6 53 33.186	−0.0117	26 11 37.19	+0.086
40 Geminorum	6.3	6 54 13.094	−0.0012	26 1 49.74	−0.015
ω Geminorum	5.2	6 57 14.119	−0.0003	24 20 15.39	0.000
47 Geminorum	5.6	7 6 6.880	−0.0011	26 59 49.58	−0.051
48 Geminorum	5.8	7 7 16.603	−0.0009	+24 16 18.56	−0.041
52 Geminorum	6.1	7 9 30.151	+0.0038	25 2 1.24	−0.086
134 B. Geminorum	6.5	7 11 47.598	+0.0058	26 50 36.72	−0.134
A Geminorum	5.1	7 18 17.674	−0.0051	25 12 53.48	−0.014
58 Geminorum	6.0	7 18 21.745	−0.0022	23 6 34.89	−0.054
B. D.+23° 1744	6.4	7 27 45.102	−0.0010	+23 4 10.93	−0.007
176 B. Geminorum	6.3	7 33 5.963	+0.0038	24 33 4.92	−0.009
181 B. Geminorum	6.0	7 34 3.977	−0.0006	24 24 56.95	−0.039
187 B. Geminorum	6.3	7 35 53.347	+0.0011	23 12 58.70	+0.007
192 B. Geminorum	6.3	7 38 18.574	−0.0014	22 36 2.78	+0.025
κ Geminorum	3.7	7 39 19.122	−0.0014	+24 36 9.66	−0.060
82 Geminorum	6.3	7 43 28.800	−0.0010	23 21 7.92	−0.001
5 B. Cancri	6.4	7 55 56.427	−0.0003	23 49 2.87	−0.047
9 Cancri	6.2	8 1 16.255	−0.0009	22 52 44.13	−0.018
μ Cancri	5.5	8 2 45.884	+0.0019	21 49 44.95	−0.084
35 B. Cancri	6.4	8 8 39.692	−0.0017	+23 23 39.28	−0.021
49 B. Cancri	6.0	8 15 23.702	+0.0052	21 0 59.42	−0.063
θ Cancri	5.5	8 26 45.092	−0.0039	18 22 56.30	−0.068
η Cancri	5.5	8 27 47.760	−0.0025	20 43 50.34	−0.055
39 Cancri	6.5	8 35 13.207	−0.0027	20 18 30.99	−0.016
40 Cancri	6.5	8 35 18.368	−0.0014	+20 16 20.15	−0.003
102 B. Cancri	6.5	8 35 29.383	−0.0048	19 58 16.62	−0.019
ε Cancri	6.3	8 35 34.723	−0.0007	19 50 46.14	−0.027
δ Cancri	4.2	8 39 51.429	−0.0008	18 28 2.70	−0.240
139 B. Cancri	6.1	8 45 54.960	−0.0011	19 9 0.84	−0.001
X Cancri (*var.*)	6.2	8 50 35.777	+0.0009	+17 33 19.88	+0.013
81 Cancri	6.4	9 7 38.633	−0.0359	15 20 21.28	+0.244
π Cancri	5.6	9 10 32.464	−0.0022	15 17 41.14	−0.008
227 B. Cancri	6.4	9 16 34.015	....	15 43 57.20	...
12 B. Leonis	6.3	9 20 50.247	−0.0042	16 57 10.78	−0.014
7 Leonis	6.2	9 31 14.341	−0.0021	+14 45 34.15	−0.002
11 Leonis	6.5	9 33 23.102	−0.0047	14 43 55.23	−0.079
ψ Leonis	5.6	9 39 6.288	−0.0002	14 24 39.56	−0.009
18 Leonis	5.8	9 41 48.725	−0.0006	12 12 7.31	+0.008
19 Leonis	6.4	9 42 51.807	−0.0049	11 57 42.79	+0.008
R Leonis (*var.*)	5–10	9 42 59.299	−0.0005	+11 49 25.38	−0.020
ν Leonis	5.0	9 53 39.075	−0.0028	12 51 2.16	−0.027
A Leonis	4.6	10 3 23.725	−0.0057	10 24 52.59	−0.067
α Leonis	1.3	10 3 50.825	−0.0169	12 22 59.05	−0.002
43 Leonis	6.3	10 18 33.650	−0.0017	+ 6 58 28.70	−0.101

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Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
44 Leonis	5.9	10 20 46.588	+0.0017	+ 9 13 2.34	−0.041
45 Leonis	5.8	10 23 9.725	+0.0011	10 11 46.09	−0.003
ρ Leonis	3.8	10 28 20.236	−0.0004	9 44 39.87	−0.003
48 Leonis	5.2	10 30 22.039	−0.0072	7 23 29.78	+0.046
49 Leonis	5.7	10 30 34.704	−0.0030	9 5 23.57	−0.010
35 Sextantis	6.1	10 38 56.282	+0.0018	+ 5 11 38.88	−0.019
37 Sextantis	6.3	10 41 40.199	−0.0010	6 49 17.09	−0.040
56 Leonis	6.1	10 51 36.746	−0.0013	6 38 21.56	−0.007
d Leonis	5.0	10 56 10.282	+0.0004	4 4 26.68	−0.022
c Leonis	5.1	10 56 20.511	−0.0035	6 33 30.35	−0.025
p^4 Leonis	5.7	11 2 34.123	−0.0253	+ 2 25 2.26	−0.080
75 Leonis	5.4	11 12 54.963	+0.0027	2 28 41.39	−0.145
76 Leonis	6.0	11 14 33.224	−0.0037	2 7 0.05	−0.053
359 B. Leonis	6.3	11 18 56.827	−0.0024	0 35 55.69	−0.015
79 Leonis	5.5	11 19 40.636	−0.0013	+ 1 52 28.34	+0.003
388 B. Leonis	6.3	11 23 33.122	−0.0025	− 1 13 54.86	+0.007
υ Leonis	4.5	11 32 35.798	0.0000	0 21 15.61	+0.039
431 B. Leonis	6.2	11 34 3.451	−0.0028	− 1 57 57.29	+0.047
9 B. Virginis	6.2	11 44 41.206	−0.0148	+ 0 9 13.53	+0.007
78 B. Virginis	6.5	12 9 54.175	−0.0051	− 5 14 47.80	+0.114
q Virginis	5.3	12 29 23.445	−0.0057	− 8 58 59.43	+0.004
χ Virginis	4.8	12 34 51.448	−0.0056	7 31 40.65	−0.031
370 B. Virginis	6.0	12 49 53.186	−0.0058	11 11 16.45	−0.037
ψ Virginis	5.0	12 49 55.837	−0.0023	9 4 39.24	−0.028
49 Virginis	5.2	13 3 26.498	+0.0007	10 17 10.28	−0.014
i Virginis	5.7	13 22 13.578	−0.0096	−12 15 56.08	−0.023
69 Virginis	4.9	13 22 54.986	−0.0086	15 31 59.26	+0.013
75 Virginis	5.6	13 28 19.008	−0.0050	14 55 33.59	+0.004
83 Virginis	5.6	13 39 54.474	+0.0007	15 45 7.07	−0.011
85 Virginis	6.1	13 41 0.318	−0.0029	15 20 26.86	−0.034
87 Virginis	5.8	13 42 47.717	+0.0025	−17 26 5.08	−0.046
89 Virginis	5.1	13 45 14.978	−0.0017	17 42 40.10	−0.040
43 H. Virginis	5.5	14 10 42.863	−0.0031	17 48 16.43	−0.015
231 G. Virginis	6.4	14 12 21.634	−0.0005	18 11 26.75	+0.106
236 G. Virginis	5.7	14 13 56.077	−0.0039	18 19 21.05	−0.001
9 G. Libræ	6.5	14 30 3.617	+0.0032	−20 4 0.51	−0.004
17 G. Libræ	6.4	14 41 21.414	−0.0047	20 48 58.01	−0.121
18 G. Libræ	6.1	14 42 23.478	−0.0032	20 58 7.83	−0.014
43 B. Libræ	5.7	14 52 29.949	+0.0745	21 1 59.68	−1.792
47 G. Libræ	6.1	15 1 32.740	+0.0065	21 42 6.15	−0.051
64 G. Libræ	5.8	15 11 27.164	−0.0028	−22 5 7.63	+0.018
153 B. Libræ	6.3	15 28 7.014	−0.0006	24 12 5.15	−0.042
42 Libræ	5.0	15 35 15.184	−0.0018	23 32 33.26	−0.027
b Scorpii	4.7	15 45 51.777	−0.0023	25 29 37.65	−0.044
A Scorpii	4.6	15 48 30.321	−0.0017	25 4 26.39	−0.023
31 B. Scorpii	5.4	15 48 49.024	−0.0022	−24 16 50.58	−0.037
3 Scorpii	5.9	15 49 33.082	−0.0031	24 59 32.92	−0.029
4 Scorpii	5.7	15 50 21.661	−0.0038	26 0 58.02	−0.028
40 B. Scorpii	5.4	15 53 28.789	−0.0031	24 35 12.58	+0.004
π Scorpii	3.0	15 53 42.394	−0.0010	−25 52 13.02	−0.048

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Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
48 B. Scorpii	4.9	15 58 12.251	−0.0048	−25 37 44.86	−0.043
50 B. Scorpii	6.4	15 58 48.324	+0.0017	24 29 33.62	−0.032
65 B. Scorpii	5.5	16 2 56.663	+0.0095	26 5 57.87	+0.023
85 B. Scorpii	6.0	16 9 44.210	−0.0005	25 15 42.79	+0.011
σ Scorpii	3.1	16 16 1.137	−0.0011	25 23 23.18	−0.039
α Scorpii	1.2	16 24 11.574	−0.0006	−26 14 39.44	−0.028
116 B. Scorpii	6.2	16 26 9.715	−0.0013	26 21 12.38	−0.037
τ Scorpii	2.9	16 30 35.282	−0.0013	28 2 26.34	−0.034
134 B. Scorpii	6.4	16 39 0.914	+0.0012	27 17 50.71	−0.014
135 B. Scorpii	6.0	16 39 41.128	−0.0015	28 21 7.72	+0.007
118 B. Ophiuchi	6.2	17 1 37.073	−0.0008	−26 23 56.53	−0.046
95 G. Ophiuchi	6.1	17 7 5.690	+0.0008	27 39 28.31	−0.029
36 Ophiuchi (*First Star*)	5.4	17 10 7.075	−0.0369	26 28 44.84	−1.169
43 Ophiuchi	5.4	17 18 0.520	−0.0002	28 3 41.35	−0.040
136 G. Ophiuchi	6.3	17 21 39.638	−0.0010	25 52 8.43	−0.003
151 G. Ophiuchi	6.0	17 26 27.701	+0.0012	−26 12 19.34	−0.026
163 G. Ophiuchi	6.3	17 37 56.574	+0.0002	27 50 38.49	−0.017
X Sagittarii (*var.*)	4.4	17 42 12.582	+0.0002	27 47 57.77	−0.015
4 G. Sagittarii	6.2	17 43 8.864	−0.0003	26 56 44.54	−0.030
10 G. Sagittarii	5.7	17 51 19.815	+0.0024	28 3 7.79	+0.015
210 B. Scorpii	5.8	17 53 15.577	+0.0028	−28 45 1.31	+0.005
38 B. Sagittarii	4.7	18 2 41.959	+0.0016	28 28 2.39	−0.020
C. D. −28° 14268	6.4	18 6 34.010	−0.0002	28 55 14.14	−0.019
48 G. Sagittarii	6.3	18 12 0.548	+0.0093	28 18 59.99	−0.234
62 B. Sagittarii	6.0	18 12 1.026	+0.0053	28 40 52.95	+0.032
66 B. Sagittarii	4.7	18 12 43.953	0.0000	−27 4 26.59	+0.015
67 B. Sagittarii	6.4	18 13 25.949	−0.0044	25 38 15.19	−0.062
58 G. Sagittarii	6.1	18 16 37.508	+0.0027	28 28 10.13	+0.005
68 G. Sagittarii	6.2	18 22 25.822	0.0000	26 41 9.59	−0.046
λ Sagittarii	2.9	18 22 43.506	−0.0033	25 28 11.22	−0.199
69 G. Sagittarii	6.3	18 22 48.063	+0.0018	−26 48 32.10	−0.032
86 B. Sagittarii	6.5	18 23 39.279	−0.0063	26 38 12.43	−0.054
126 B. Sagittarii	5.7	18 39 36.070	−0.0008	25 5 50.46	−0.041
φ Sagittarii	3.3	18 40 20.767	+0.0034	27 4 44.82	−0.006
σ Sagittarii	2.1	18 49 59.674	−0.0003	26 24 12.19	−0.075
162 B. Sagittarii	6.4	18 53 7.845	−0.0009	−24 59 27.82	−0.030
127 G. Sagittarii	6.4	18 55 11.873	+0.0023	25 3 40.20	+0.051
172 B. Sagittarii	5.8	18 57 15.699	+0.0002	24 57 53.42	−0.172
189 B. Sagittarii	6.1	19 3 3.036	+0.0012	24 47 27.27	+0.001
201 B. Sagittarii	5.9	19 7 59.605	−0.0015	26 3 1.01	−0.018
ψ Sagittarii	4.9	19 10 19.768	+0.0025	−25 24 15.01	−0.035
208 B. Sagittarii	6.1	19 10 22.562	+0.0072	24 19 29.70	−0.078
χ Sagittarii	4.9	19 20 6.232	+0.0033	24 40 28.22	−0.063
49 Sagittarii	5.5	19 20 21.068	−0.0017	24 7 46.71	+0.001
51 Sagittarii	5.8	19 30 52.107	+0.0004	24 54 21.29	−0.005
h Sagittarii	4.7	19 31 32.153	+0.0044	−25 4 19.74	−0.027
53 Sagittarii	6.3	19 34 43.086	−0.0004	23 37 18.86	−0.037
274 B. Sagittarii	6.1	19 35 0.665	+0.0018	23 37 28.29	−0.031
308 B. Sagittarii	6.3	19 49 12.480	−0.0094	24 9 12.38	−0.438
329 B. Sagittarii	6.1	19 56 20.929	+0.0010	−22 58 18.13	−0.005

MEAN PLACES FOR 1915.0. (January 0d.732, Washington.)

Name of Star.	Magnitude.	Right Ascension.	Annual Proper Motion.	Declination.	Annual Proper Motion.
		h m s	s	° ′ ″	″
36 B. Sagittarii . .	6.5	19 58 42.222	−0.0019	−22 50 4.42	+0.052
4 Capricorni . .	5.7	20 13 1.838	+0.0012	22 4 23.88	−0.032
σ Capricorni . .	5.5	20 14 29.455	−0.0002	19 23 4.37	−0.006
36 B. Capricorni . .	6.2	20 24 32.221	+0.0003	22 40 26.82	−0.027
ο Capricorni . .	5.6	20 25 1.648	+0.0011	18 51 54.86	−0.081
υ Capricorni . .	5.3	20 35 12.769	−0.0018	−18 26 18.57	−0.007
31 B. Capricorni . .	6.4	20 44 31.367	−0.0004	18 21 0.09	−0.019
19 Capricorni . .	5.7	20 49 59.785	−0.0041	18 14 45.08	−0.013
94 B. Capricorni . .	5.7	20 52 55.279	+0.0046	16 21 32.46	+0.030
20 Capricorni . .	6.2	20 54 46.487	+0.0012	19 21 55.85	−0.020
21 Capricorni . .	6.5	20 56 4.869	−0.0025	−17 51 46.34	−0.002
θ Capricorni . .	4.2	21 1 10.251	+0.0050	17 34 16.91	−0.066
14 B. Capricorni . .	6.1	21 10 21.390	−0.0011	17 41 49.56	. . .
29 Capricorni . .	5.5	21 11 2.680	+0.0016	15 31 31.19	+0.004
30 Capricorni . .	5.4	21 13 11.440	+0.0015	18 20 30.87	−0.002
31 Capricorni . .	6.3	21 13 30.451	+0.0031	−17 49 9.95	+0.006
ι Capricorni . .	4.3	21 17 30.963	+0.0022	17 11 49.76	+0.003
42 Capricorni . .	5.1	21 36 55.684	−0.0084	14 25 37.58	−0.302
44 Capricorni . .	6.0	21 38 26.263	−0.0005	14 47 19.79	+0.024
45 Capricorni . .	5.8	21 39 22.648	−0.0013	15 8 22.30	−0.002
λ Capricorni . .	5.5	21 41 57.661	+0.0015	−11 45 30.33	−0.004
51 B. Capricorni . .	6.1	21 45 5.513	−0.0009	13 7 10.07	+0.031
μ Capricorni . .	5.2	21 48 39.795	+0.0204	13 57 9.12	+0.001
96 B. Aquarii . . .	6.5	21 49 3.423	−0.0001	10 42 44.22	+0.006
ε Aquarii . . .	5.4	22 6 4.919	+0.0019	11 58 59.89	+0.020
θ Aquarii . . .	4.3	22 12 20.960	+0.0073	− 8 12 24.85	−0.019
50 B. Aquarii . . .	6.0	22 12 23.441	−0.0034	9 27 50.21	−0.005
ρ Aquarii . . .	5.3	22 15 43.650	+0.0008	8 14 54.58	−0.008
70 B. Aquarii . . .	6.0	22 19 4.792	+0.0012	7 37 27.90	+0.033
86 B. Aquarii . . .	6.1	22 26 50.965	+0.0129	6 59 21.95	−0.129
67 G. Aquarii . . .	6.3	22 33 54.478	+0.0010	− 8 20 21.66	+0.012
113 B. Aquarii . . .	6.5	22 38 36.281	+0.0014	8 45 23.33	+0.031
67 Aquarii . . .	6.4	22 38 48.012	+0.0015	7 24 29.49	−0.007
152 B. Aquarii . . .	5.8	22 50 46.417	−0.0003	5 26 26.65	+0.009
197 G. Aquarii . . .	6.3	22 52 53.173	−0.0024	5 15 52.47	+0.006
6 G. Piscium . . .	6.2	22 53 52.946	+0.0002	− 2 51 2.51	−0.082
163 B. Aquarii . . .	6.1	22 57 7.809	+0.0007	5 10 6.81	+0.002
193 B. Aquarii . . .	5.5	23 11 11.559	−0.0011	3 57 35.38	+0.003
22 B. Piscium . . .	6.4	23 19 10.310	+0.0043	− 0 10 31.15	+0.038
κ Piscium . . .	4.9	23 22 34.509	+0.0056	+ 0 47 24.69	−0.093
9 Piscium . . .	6.4	23 22 53.550	+0.0032	+ 0 39 20.27	−0.029
13 Piscium . . .	6.4	23 27 35.872	+0.0003	− 1 33 19.28	+0.023
14 Piscium . . .	5.9	23 29 46.805	+0.0073	− 1 43 1.31	−0.005
16 Piscium . . .	5.7	23 32 3.022	−0.0074	+ 1 37 49.53	+0.057
λ Piscium . . .	4.6	23 37 42.538	−0.0092	1 18 43.74	−0.154
19 Piscium . . .	5.4	23 42 2.842	−0.0034	+ 3 0 54.75	−0.020
21 Piscium . . .	5.6	23 45 6.347	+0.0002	0 36 14.77	−0.033
22 Piscium . . .	5.8	23 47 36.720	+0.0009	2 27 28.32	−0.011
25 Piscium . . .	6.2	23 48 43.511	+0.0003	+ 1 37 4.94	−0.004

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limit-ing Pa- allels	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
37 Geminorum	5.7	+2.22	+4.6	+25 29.1	0 21 28.6	+ 9 19.1	+1.2719	0.5584	−0.0835	+73	+
39 Geminorum	6.2	2.24	4.3	26 11.7	22 58.6	+10 45.9	+0.3755	0.5580	0.0873	+66	−
40 Geminorum	6.3	2.24	4.3	26 1.9	23 15.9	+11 2.5	+0.5264	0.5580	0.0881	+80	+
47 Geminorum	5.6	2.27	3.6	26 59.9	1 4 25.6	− 7 58.8	−1.0043	0.5568	0.1011	−17	−
52 Geminorum	6.1	2.22	3.4	25 2.1	5 54.0	− 6 33.4	+0.9604	0.5564	0.1047	+90	+
134 B. Geminorum	6.5	+2.26	+3.2	+26 50.7	6 53.9	− 5 35.7	−1.0952	0.5561	−0.1072	−24	−
A Geminorum	5.1	2.23	2.8	25 12.9	9 44.2	− 2 51.4	+0.3447	0.5553	0.1142	+65	−
176 B. Geminorum	6.3	2.22	1.9	24 33.1	16 14.0	+ 3 24.7	+0.2650	0.5531	0.1297	+60	−
181 B. Geminorum	6.0	2.21	1.9	24 25.0	16 39.6	+ 3 49.3	+0.3550	0.5529	0.1307	+66	−
κ Geminorum	3.7	2.21	1.5	24 36.2	18 58.7	+ 6 3.5	−0.1549	0.5521	0.1361	+35	−
82 Geminorum	6.3	+2.18	+1.4	+23 21.2	20 49.2	+ 7 50.2	+0.9314	0.5514	−0.1403	+90	+
5 B. Cancri	6.4	2.18	0.5	23 49.1	2 2 22.0	−10 48.6	−0.3798	0.5491	0.1527	+23	−
9 Cancri	6.2	2.16	0.3	22 52.7	4 45.1	− 8 30.4	+0.2536	0.5481	0.1578	+59	−
μ Cancri	5.5	2.13	+0.3	21 49.8	5 25.3	− 7 51.6	+1.2692	0.5478	0.1593	+82	+
35 B. Cancri	6.4	2.16	−0.3	23 23.6	8 4.5	− 5 17.9	−0.8328	0.5466	0.1649	− 3	−
49 B. Cancri	6.0	+2.10	−0.4	+21 1.0	11 7.1	− 2 21.5	+1.1932	0.5452	−0.1712	+90	−
η Cancri	5.5	2.07	1.2	20 43.8	16 45.7	+ 3 5.7	+0.4984	0.5426	0.1824	+76	−
39 Cancri	6.5	2.05	1.5	20 18.5	20 10.0	+ 6 23.0	+0.3150	0.5410	0.1888	+62	−
40 Cancri	6.5	2.05	1.6	20 16.3	20 12.3	+ 6 25.3	+0.3462	0.5410	0.1889	+64	−
102 B. Cancri	6.5	2.05	1.5	19 58.3	20 17.4	+ 6 30.2	+0.6502	0.5409	0.1891	+90	+
ε Cancri	6.3	+2.04	−1.5	+19 50.7	20 19.8	+ 6 32.5	+0.7755	0.5409	−0.1891	+90	+
139 B. Cancri	6.1	2.00	2.1	19 9.0	3 1 6.3	+11 9.5	+0.5898	0.5387	0.1978	+83	−
227 B. Cancri	6.4	1.86	3.2	15 43.9	15 29.3	+ 1 4.1	+1.1844	0.5320	0.2213	+90	+
12 B. Leonis	6.3	1.87	3.7	16 57.1	17 31.2	+ 3 2.1	−0.5563	0.5311	0.2242	+14	−
7 Leonis	6.2	1.80	3.8	14 45.5	22 29.6	+ 7 50.9	+0.6235	0.5290	0.2311	+85	−
11 Leonis	6.5	+1.80	−3.9	+14 43.9	23 31.4	+ 8 50.8	+0.4132	0.5286	−0.2325	+68	−
ψ Leonis	5.6	1.77	4.2	14 24.6	4 2 16.7	+11 30.9	+0.1054	0.5275	0.2361	+40	−
ν Leonis	5.0	1.70	4.6	12 51.0	9 19.9	− 5 39.4	+0.0492	0.5249	0.2445	+46	−
α Leonis	1.3	1.65	5.1	12 22.9	14 18.8	− 0 49.9	−0.6914	0.5232	0.2498	+ 8	−
44 Leonis	5.9	1.54	5.1	9 13.0	22 38.7	+ 7 14.5	+0.5054	0.5209	0.2575	+74	−
45 Leonis	5.8	+1.55	−5.4	+10 11.7	23 49.4	+ 8 23.0	−0.8207	0.5206	−0.2585	+ 1	−
ρ Leonis	3.8	1.52	5.6	9 44.6	5 2 23.1	+10 51.9	−1.1035	0.5200	0.2606	−11	−
48 Leonis	5.2	1.48	5.0	7 23.4	3 23.5	+11 50.5	+1.1771	0.5198	0.2614	+90	+
49 Leonis	5.7	1.50	5.5	9 5.3	3 29.8	+11 56.6	−0.6207	0.5198	0.2614	+12	−
37 Sextantis	6.3	1.42	5.4	6 49.2	9 0.3	− 6 43.1	+0.2911	0.5188	0.2652	+60	−
56 Leonis	6.1	+1.38	−5.8	+ 6 38.3	13 57.5	− 1 55.0	−0.8400	0.5182	−0.2681	0	−
d Leonis	5.0	1.33	5.2	4 4.4	16 13.9	+ 0 17.2	+1.2124	0.5180	0.2693	+90	+
c Leonis	5.1	1.35	6.0	6 33.4	16 19.0	+ 0 22.1	−1.3889	0.5180	0.2694	−40	−
75 Leonis	5.4	1.23	5.4	2 28.6	6 0 35.2	+ 8 23.2	+0.5983	0.5177	0.2727	+81	−
76 Leonis	6.0	1.22	5.4	2 6.9	1 24.3	+ 9 10.7	+0.7493	0.5178	0.2730	+90	−
79 Leonis	5.5	+1.20	−5.5	+ 1 52.4	3 57.6	+11 39.3	+0.3008	0.5178	−0.2737	+60	−
υ Leonis	4.5	1.11	5.3	− 0 21.3	10 23.7	− 6 6.4	+0.8359	0.5184	0.2748	+90	
9 B. Virginis	6.2	1.06	5.9	+ 0 9.1	16 23.8	− 0 17.4	−1.3379	0.5194	0.2751	−38	−
78 B. Virginis	6.5	0.89	5.0	− 5 14.9	7 4 48.7	+11 44.3	+0.8027	0.5227	0.2733	+85	−
χ Virginis	4.8	0.75	5.0	7 31.8	16 54.0	− 0 33.4	−0.1407	0.5277	0.2682	+35	−
ψ Virginis	5.0	+0.66	−4.9	− 9 4.7	8 0 4.6	+ 6 23.4	−0.4686	0.5315	−0.2636	+18	−
49 Virginis	5.2	0.58	4.9	10 17.3	6 25.1	−11 28.6	−0.8930	0.5352	0.2584	− 0	−
i Virginis	5.7	0.48	4.7	12 16.0	15 4.8	− 3 6.2	−1.0824	0.5410	0.2498	−20	−
75 Virginis	5.6	0.43	4.0	14 55.6	17 50.9	− 0 25.8	+0.9286	0.5431	0.2466	+75	+
83 Virginis	5.6	0.37	4.0	15 45.2	23 3.5	+ 4 36.1	+0.4965	0.5470	0.2399	+65	−
85 Virginis	6.1	+0.36	−4.2	−15 20.5	23 32.9	+ 5 4.5	−0.0369	0.5474	−0.2393	+36	−
43 H. Virginis	5.5	0.20	4.2	17 48.3	9 12 32.4	− 6 23.6	−0.5310	0.5581	0.2193	+ 8	−
231 G. Virginis	6.4	0.19	4.1	18 11.5	13 14.7	− 5 42.9	−0.2956	0.5587	0.2181	+20	−
236 G. Virginis	5.7	0.19	4.1	18 19.4	13 55.1	− 5 3.9	−0.3091	0.5593	0.2169	+19	−
9 G. Libræ	6.5	0.10	3.9	20 4.1	20 44.1	+ 1 30.0	+0.0128	0.5652	0.2042	+34	−
17 G. Libræ	6.4	+0.04	−4.0	−20 49.0	10 1 25.7	+ 6 1.0	−0.1689	0.5693	−0.1946	+24	−

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
8 G. Libræ	6.1	+0.04	− 4.0	−20 58.2	10 1 51.3	+ 6 25.7	−0.0980	0.5697	−0.1937	+28	−49
3 B. Libræ	5.7	0.00	4.2	21 2.1	5 59.6	+10 24.6	−0.8158	0.5733	0.1847	−12	−90
7 G. Libræ	6.1	−0.05	4.2	21 42.2	9 39.2	−10 4.2	−0.8042	0.5765	0.1762	−12	−90
4 G. Libræ	5.8	0.09	4.4	22 5.2	13 37.0	− 6 15.8	−1.0981	0.5799	0.1667	−32	−90
3 B. Libræ	6.3	0.17	4.2	24 12.2	20 11.2	+ 0 2.9	−0.0145	0.5853	0.1499	+27	−45
42 Libræ	5.0	−0.19	− 4.5	−23 32.6	22 57.9	+ 2 43.0	−1.0810	0.5875	−0.1424	−34	−90
b Scorpii	4.7	0.24	4.3	25 29.7	11 3 3.5	+ 6 38.6	+0.3156	0.5906	0.1310	+42	−26
A Scorpii	4.6	0.25	4.5	25 4.5	4 4.3	+ 7 37.0	−0.2364	0.5913	0.1281	+13	−58
31 B. Scorpii	5.4	0.25	4.7	24 16.9	4 11.5	+ 7 43.9	−1.0467	0.5914	0.1277	−33	−90
3 Scorpii	5.9	0.26	4.5	24 59.6	4 28.4	+ 8 0.1	−0.3692	0.5916	0.1269	+ 6	−67
4 Scorpii	5.7	−0.26	− 4.2	−26 1.0	4 47.0	+ 8 17.9	+0.6176	0.5919	−0.1260	+59	− 9
40 B. Scorpii	5.4	0.26	4.7	24 35.3	5 58.4	+ 9 26.4	−0.9628	0.5927	0.1226	−27	−90
π Scorpii	3.0	0.28	4.4	25 52.3	6 3.6	+ 9 31.4	+0.3128	0.5927	0.1223	+41	−26
48 B. Scorpii	4.9	0.29	4.6	25 37.8	7 46.3	+11 9.9	−0.1340	0.5939	0.1173	+18	−52
65 B. Scorpii	5.5	0.31	4.5	26 6.0	9 34.1	−11 6.7	+0.1311	0.5951	0.1120	+31	−36
85 B. Scorpii	6.0	−0.32	− 4.9	−25 15.8	12 7.9	− 8 39.3	−0.9850	0.5967	−0.1042	−31	−90
σ Scorpii	3.1	0.34	5.1	25 23.5	14 29.5	− 6 23.6	−1.0941	0.5980	0.0970	−39	−90
α Scorpii	1.2	0.37	5.0	26 14.7	17 32.8	− 3 28.0	−0.5199	0.5997	0.0874	− 5	−79
16 B. Scorpii	6.2	0.38	5.1	26 21.3	18 16.8	− 2 45.9	−0.4740	0.6002	0.0851	− 3	−75
τ Scorpii	2.9	0.41	4.8	28 2.5	19 55.6	− 1 11.2	+1.0803	0.6010	0.0799	+62	+24
134 B. Scorpii	6.4	−0.42	− 5.2	−27 17.9	23 2.9	+ 1 48.2	+0.1022	0.6023	−0.0698	+25	−38
135 B. Scorpii	6.0	0.43	4.9	28 21.2	23 17.8	+ 2 2.4	+1.1414	0.6024	0.0690	+62	+31
118 B. Ophiuchi	6.2	0.46	5.9	26 24.0	12 7 22.1	+ 9 46.1	−1.2649	0.6050	0.0423	−61	−72
95 G. Ophiuchi	6.1	0.48	5.8	27 39.6	9 22.5	+11 41.3	−0.0819	0.6055	0.0356	+13	−49
43 Ophiuchi	5.4	0.51	5.9	28 3.8	13 22.0	− 8 29.4	+0.2074	0.6061	0.0222	+27	−32
163 G. Ophiuchi	6.3	−0.54	− 6.4	−27 50.7	20 39.0	− 1 31.1	−0.0818	0.6063	−0.0026	+10	−49
				NEW	*MOON.*						
44 Capricorni	6.0	−0.30	− 6.4	−14 47.4	16 21 50.6	− 4 4.0	+0.2536	0.5330	+0.2388	+52	−31
45 Capricorni	5.8	0.30	6.5	15 8.5	22 17.3	− 3 38.2	+0.7253	0.5327	0.2392	+75	− 5
151 B. Capricorni	6.1	−0.29	− 6.0	−13 7.3	17 1 0.4	− 1 0.4	−0.7268	0.5303	+0.2421	+ 2	−90
μ Capricorni	5.2	0.27	6.1	13 57.3	2 43.0	+ 0 38.8	+0.5583	0.5288	0.2438	+70	−15
JUPITER	-1.6	. . .	. . .	13 40.5	5 29.4	+ 3 20.1	+0.9484	0.5174	0.2431	+76	+ 7
e Aquarii	5.4	0.23	5.4	11 59.1	11 11.5	+ 8 51.3	+0.5973	0.5219	0.2510	+75	−13
150 B. Aquarii	6.0	0.22	4.7	9 27.9	14 18.9	+11 52.9	−1.2622	0.5195	0.2533	−33	−90
167 G. Aquarii	6.3	−0.15	− 3.9	− 8 20.4	18 1 10.2	− 1 35.4	+0.3334	0.5120	+0.2594	+60	−27
213 B. Aquarii	6.5	0.13	3.8	8 45.5	3 34.8	+ 0 44.9	+1.4024	0.5104	0.2604	+73	+50
67 Aquarii	6.4	0.14	3.6	7 24.6	3 40.8	+ 0 50.7	+0.0002	0.5103	0.2604	+42	−44
252 B. Aquarii	5.8	0.11	2.7	5 26.5	9 53.1	+ 6 52.0	−0.4660	0.5067	0.2624	+19	−71
197 G. Aquarii	6.3	0.10	2.6	5 15.9	10 59.3	+ 7 56.3	−0.3638	0.5061	0.2627	+24	−64
263 B. Aquarii	6.1	−0.09	− 2.4	− 5 10.2	13 12.8	+10 6.0	+0.1188	0.5049	+0.2632	+49	−38
293 B. Aquarii	5.5	−0.04	1.7	3 57.6	20 39.1	− 6 40.6	+0.7929	0.5014	0.2643	+86	− 3
13 Piscium	6.4	+0.02	0.5	1 33.3	19 5 26.7	+ 1 52.0	+0.5426	0.4979	0.2642	+77	−16
14 Piscium	5.9	0.03	− 0.4	− 1 43.0	6 37.3	+ 3 0.6	+1.0279	0.4975	0.2640	+88	+11
λ Piscium	4.6	0.04	+ 0.7	+ 1 18.7	10 54.9	+ 7 11.0	−1.0999	0.4962	0.2635	−16	−89
21 Piscium	5.6	+0.08	+ 0.7	+ 0 36.3	14 56.3	+11 5.7	+0.7216	0.4953	+0.2627	+90	− 7
22 Piscium	5.8	0.08	1.4	2 27.5	16 18.2	−11 34.7	−0.9218	0.4949	0.2623	− 5	−88
25 Piscium	6.2	0.09	1.2	1 37.1	16 54.7	−10 59.2	+0.1447	0.4948	0.2622	+52	−36
51 Piscium	5.6	0.25	4.0	6 29.2	20 14 27.6	+ 9 58.0	+0.4234	0.4927	0.2530	+68	−21
136 B. Piscium	6.5	0.28	5.1	8 53.6	19 17.5	− 9 20.1	−0.9883	0.4929	0.2500	− 9	−81
η Piscium	3.7	+0.53	+ 8.5	+14 54.6	21 22 33.6	− 6 49.7	−1.0733	0.4982	+0.2271	−16	−75
101 Piscium	6.2	0.56	8.4	14 13.8	22 0 51.7	− 4 35.5	+0.1966	0.4990	0.2247	+55	−29
105 Piscium	6.1	0.57	9.1	15 58.7	2 55.6	− 2 35.1	−1.2694	0.4997	0.2224	−34	−74
4 Arietis	5.8	0.62	9.5	16 32.1	7 26.0	+ 1 47.5	−0.8948	0.5014	0.2173	− 5	−73
ι Arietis	5.1	0.68	10.0	17 24.3	12 15.3	+ 6 28.5	−0.8223	0.5033	0.2116	− 1	−73
35 B. Arietis	6.4	+0.71	+10.3	+17 50.9	15 34.8	+ 9 42.2	−0.6149	0.5048	+0.2074	+11	−70

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N	S
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
47 B. Arietis	6.5	+0.74	+10.2	+17 37.7	22 17 41.6	+11 45.3	+0.0639	0.5058	+0.2047	+48	−33
20 H¹. Arietis	6.4	0.76	10.0	16 49.7	18 32.1	−11 25.7	+1.1192	0.5062	0.2036	+90	+27
15 Arietis	5.9	0.75	10.8	19 6.2	19 9.4	−10 49.5	−1.2686	0.5065	0.2027	−36	−71
θ Arietis	5.6	0.80	11.0	19 30.7	23 1.8	− 7 3.9	−0.9464	0.5083	0.1975	− 9	−70
26 Arietis	6.2	0.88	11.2	19 28.9	23 5 25.2	− 0 52.0	+0.3194	0.5116	0.1882	+63	−18
ν Arietis	5.4	+0.94	+12.0	+21 35.9	9 32.1	+ 3 7.5	−1.2611	0.5138	+0.1820	−38	−68
μ Arietis	5.7	0.96	11.3	19 39.2	11 20.4	+ 4 52.5	+1.2176	0.5148	0.1792	+90	+39
ε Arietis (*mean*)	4.6	1.08	11.9	21 0.3	19 41.9	−11 1.5	+1.1626	0.5196	0.1654	+90	+36
64 Arietis	5.8	1.25	12.9	24 25.6	24 7 50.8	+ 0 44.5	−0.7480	0.5268	0.1434	+ 2	−65
7 Tauri	5.9	1.32	12.7	24 11.0	12 41.0	+ 5 25.4	+0.1928	0.5298	0.1340	+55	−18
11 Tauri	6.1	+1.37	+13.0	+25 3.5	15 39.7	+ 8 18.3	−0.3847	0.5315	+0.1280	+22	−47
16 Tauri	5.4	1.39	12.5	24 1.6	17 34.4	+10 9.2	+0.9975	0.5327	0.1241	+90	+28
17 Tauri	3.8	1.39	12.5	23 51.0	17 36.6	+10 11.4	+1.1965	0.5327	0.1240	+90	+45
18 Tauri	5.6	1.40	12.7	24 34.6	17 44.0	+10 18.5	+0.4088	0.5328	0.1238	+70	− 5
q Tauri	4.3	1.40	12.6	24 12.3	17 45.6	+10 20.0	+0.8231	0.5328	0.1237	+90	+17
20 Tauri	4.1	+1.40	+12.6	+24 6.4	18 3.2	+10 37.1	+0.9681	0.5330	+0.1231	+90	+20
21 Tauri	5.8	1.40	12.6	24 17.6	18 5.3	+10 39.1	+0.7658	0.5330	0.1231	+90	+14
22 Tauri	6.5	1.40	12.6	24 16.0	18 9.2	+10 42.9	+0.8031	0.5330	0.1229	+90	+10
14 H. Tauri	5.3	1.44	12.9	25 19.6	20 8.0	−11 22.2	−0.1294	0.5342	0.1188	+36	−32
p Tauri	5.6	1.58	12.8	26 15.8	25 5 36.2	− 2 12.9	−0.1336	0.5397	0.0983	+36	−31
φ Tauri	5.0	+1.65	+12.8	+27 9.1	9 55.7	+ 1 57.8	−0.7084	0.5421	+0.0885	+ 3	−63
χ Tauri	5.3	1.66	12.2	25 26.0	10 58.0	+ 2 58.1	+1.2757	0.5426	0.0861	+72	+59
17 B. Aurigæ	6.0	1.87	11.9	27 45.6	26 0 26.9	− 8 0.9	−0.3395	0.5493	0.0537	+24	−38
38 B. Aurigæ	6.5	1.94	11.4	27 34.9	5 40.8	− 2 58.0	+0.1033	0.5515	0.0406	+50	−13
47 B. Aurigæ	6.0	1.98	11.3	27 55.6	7 55.1	− 0 48.4	−0.1911	0.5524	0.0350	+33	−28
354 B. Tauri	6.4	+2.04	+10.8	+27 52.5	12 50.0	+ 3 56.0	+0.0074	0.5542	+0.0224	+44	−10
22 Aurigæ	6.4	2.08	10.9	28 51.6	13 51.4	+ 4 55.3	−1.0476	0.5545	0.0197	−22	−61
β Tauri	1.8	2.09	10.7	28 32.4	15 7.7	+ 6 8.8	−0.6744	0.5549	0.0164	+ 5	−57
107 B. Aurigæ	6.5	2.13	10.0	27 36.6	19 19.7	+10 11.9	+0.3865	0.5562	0.0055	+69	+ 5
112 B. Aurigæ	5.7	2.12	9.8	26 52.5	19 52.1	+10 43.1	+1.1917	0.5563	+0.0040	+86	+55
406 B. Tauri	5.6	+2.21	+ 9.3	+27 56.8	27 1 49.1	− 7 32.6	+0.0001	0.5577	−0.0117	+44	−15
136 Tauri	4.6	2.22	9.1	27 35.7	2 50.5	− 6 33.4	+0.3681	0.5579	0.0144	+68	+ 3
154 B. Aurigæ	6.4	2.26	9.2	28 55.9	4 12.7	− 5 14.2	−1.1082	0.5581	0.0181	−28	−61
415 B. Tauri	6.1	2.26	8.7	27 34.3	6 9.0	− 3 22.1	+0.3320	0.5584	0.0232	+65	+ 1
49 Aurigæ	5.1	2.42	6.8	28 5.5	20 49.5	+10 46.6	−0.8576	0.5594	0.0622	− 7	−62
54 Aurigæ	5.8	+2.44	+ 6.5	+28 20.5	22 41.4	−11 25.5	−1.2469	0.5594	−0.0671	−47	−62
39 Geminorum	6.2	2.46	4.9	26 11.7	28 7 0.7	− 3 24.3	+0.4182	0.5587	0.0889	+71	− 1
40 Geminorum	6.3	2.46	4.8	26 1.9	7 17.8	− 3 7.8	+0.5682	0.5586	0.0896	+84	+ 7
47 Geminorum	5.6	2.52	4.2	26 59.9	12 25.7	+ 1 49.0	−0.9634	0.5579	0.1027	−14	−63
52 Geminorum	6.1	2.49	3.7	25 2.1	13 53.6	+ 3 13.9	+0.9906	0.5576	0.1064	+90	+30
134 B. Geminorum	6.5	+2.54	+ 3.7	+26 50.7	14 53.0	+ 4 11.1	−1.0573	0.5574	−0.1089	−21	−63
A Geminorum	5.1	2.52	3.1	25 12.9	17 42.0	+ 6 54.1	+0.3721	0.5568	0.1159	+67	− 6
176 B. Geminorum	6.3	2.54	2.0	24 33.1	29 0 8.5	−10 53.1	+0.2835	0.5552	0.1316	+61	−12
181 B. Geminorum	6.0	2.54	1.9	24 25.0	0 33.9	−10 28.6	+0.3725	0.5551	0.1326	+67	− 8
κ Geimnorum	3.7	2.55	1.6	24 36.2	2 51.7	− 8 15.7	−0.1378	0.5544	0.1381	+36	−34
82 Geminorum	6.3	+2.53	+ 1.1	+23 21.2	4 41.1	− 6 30.1	+0.9396	0.5538	−0.1423	+90	+23
5 B. Cancri	6.4	2.56	+ 0.3	23 49.1	10 10.2	− 1 12.6	−0.3716	0.5520	0.1549	+23	−48
9 Cancri	6.2	2.55	− 0.2	22 52.7	12 31.7	+ 1 4.0	+0.2543	0.5512	0.1602	+59	−17
μ Cancri	5.5	2.52	0.4	21 49.7	13 11.4	+ 1 42.3	+1.2624	0.5510	0.1616	+83	+45
35 B. Cancri	6.4	2.57	0.7	23 23.6	15 48.6	+ 4 14.0	−0.8295	0.5500	0.1674	− 3	−67
49 B. Cancri	6.0	+2.52	− 1.3	+21 1.0	18 48.7	+ 7 7.9	+1.1785	0.5489	−0.1738	+90	+37
η Cancri	5.5	2.52	2.2	20 43.8	30 0 22.6	−11 29.7	+0.4803	0.5467	0.1851	+74	− 8
39 Cancri	6.5	2.52	2.7	20 18.5	3 43.8	− 8 15.5	+0.2935	0.5453	0.1917	+61	−18
40 Cancri	6.5	2.52	2.7	20 16.3	3 46.1	− 8 13.2	+0.3243	0.5453	0.1918	+63	−16
102 B. Cancri	6.5	2.51	2.7	19 58.2	3 51.1	− 8 8.4	+0.6260	0.5452	0.1920	+87	− 1
Cancri	6.3	+2.51	− 2.7	+19 50.7	3 53.5	− 8 6.1	+0.7502	0.5452	−0.1920	+90	+ 6

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
39 B. Cancri	6.1	+2.49	− 3.5	+19 9.0	30 8 35.5	− 3 33.7	+0.5591	0.5433	−0.2009	+81	− 5
27 B. Cancri	6.4	2.41	5.5	15 43.9	22 43.5	+10 6.0	+1.1288	0.5375	0.2249	+90	+26
12 B. Leonis	6.3	2.43	5.8	16 57.1	31 0 43.1	−11 58.4	−0.5996	0.5367	0.2279	+12	−70
7 Leonis	6.2	2.38	6.4	14 45.5	5 35.8	− 7 15.3	+0.5633	0.5348	0.2349	+80	− 9
11 Leonis	6.5	2.38	6.6	14 43.8	6 36.4	− 6 16.6	+0.3537	0.5344	0.2363	+64	−20
ψ Leonis	5.6	+2.37	− 6.9	+14 24.5	9 18.5	− 3 39.8	+0.0450	0.5334	−0.2400	+46	−36
ν Leonis	5.0	2.32	7.7	12 50.9	16 13.2	+ 3 1.5	−0.0194	0.5310	0.2485	+43	−41
A Leonis	4.6	2.26	8.1	10 24.7	20 53.0	+ 7 32.3	+1.3389	0.5295	0.2537	+83	+43
α Leonis	1.3	+2.29	− 8.3	+12 22.8	21 6.1	+ 7 45.0	−0.7593	0.5294	−0.2540	+ 4	−78
FEBRUARY.											
44 Leonis	5.9	+2.20	− 8.9	+ 9 12.9	1 5 15.6	− 8 21.0	+0.4174	0.5272	−0.2618	+68	−20
45 Leonis	5.8	2.21	9.2	10 11.6	6 24.9	− 7 13.9	−0.8983	0.5269	0.2628	− 4	−80
ρ Leonis	3.8	2.20	9.4	9 44.5	8 55.5	− 4 48.1	−1.0922	0.5264	0.2648	−16	−80
48 Leonis	5.2	+2.16	− 9.2	+ 7 23.3	9 54.6	− 3 50.9	+1.0782	0.5261	−0.2656	+90	+16
49 Leonis	5.7	2.18	9.4	9 5.2	10 0.8	− 3 44.9	−0.7040	0.5261	0.2656	+ 7	−80
37 Sextantis	6.3	2.12	9.8	6 49.1	15 24.6	+ 1 28.7	+0.1942	0.5251	0.2694	+54	−33
56 Leonis	6.1	2.09	10.1	6 38.2	20 15.8	+ 6 10.8	−0.9321	0.5244	0.2723	− 6	−83
d Leonis	5.0	2.04	9.9	4 4.3	22 29.5	+ 8 20.3	+1.1012	0.5241	0.2734	+90	+17
75 Leonis	5.4	+1.97	−10.4	+ 2 28.5	2 6 41.3	− 7 43.3	+0.4855	0.5235	−0.2766	+73	−19
76 Leonis	6.0	1.96	10.4	2 6.8	7 29.4	− 6 56.8	+0.6347	0.5235	0.2768	+84	−11
79 Leonis	5.5	1.95	10.5	+ 1 52.3	9 59.9	− 4 31.0	+0.1876	0.5235	0.2774	+54	−34
υ Leonis	4.5	1.88	10.6	− 0 21.4	16 19.3	+ 1 36.6	+0.7147	0.5237	0.2784	+90	− 7
78 B. Virginis	6.5	1.71	10.6	5 15.0	3 10 28.2	− 4 48.8	+0.6737	0.5267	0.2759	+84	− 9
χ Virginis	4.8	+1.60	−10.7	− 7 31.9	22 26.0	+ 6 46.0	−0.2694	0.5305	−0.2700	+29	−59
ψ Virginis	5.0	1.52	10.6	9 4.8	4 5 33.6	−10 20.4	−0.5980	0.5335	0.2648	+11	−82
49 Virginis	5.2	1.46	10.5	10 17.3	11 52.4	− 4 14.1	−1.0230	0.5365	0.2592	−14	−90
i Virginis	5.7	1.38	10.3	12 16.1	20 31.3	+ 4 7.6	−1.2134	0.5413	0.2499	−30	−90
75 Virginis	5.6	1.34	9.5	14 55.7	23 17.4	+ 6 48.0	+0.8005	0.5428	0.2465	+75	− 1
83 Virginis	5.6	+1.30	− 9.4	−15 45.3	5 4 30.8	+11 50.7	+0.3692	0.5462	−0.2395	+58	−25
85 Virginis	6.1	1.29	9.5	15 20.6	5 0.3	−11 40.8	−0.1655	0.5465	0.2388	+29	−53
43 H. Virginis	5.5	1.15	9.1	17 48.4	18 4.8	+ 0 56.2	−0.6579	0.5554	0.2180	+ 1	−90
231 G. Virginis	6.4	1.14	9.0	18 11.6	18 47.5	+ 1 37.3	−0.4212	0.5559	0.2168	+14	−69
236 G. Virginis	5.7	1.14	9.0	18 19.5	19 28.3	+ 2 16.6	−0.4345	0.5564	0.2155	+13	−71
9 G. Libræ	6.5	+1.06	− 8.5	−20 4.2	6 2 21.9	+ 8 55.2	−0.1079	0.5614	−0.2025	+28	−50
17 G. Libræ	6.4	1.01	8.4	20 49.1	7 7.2	−10 30.0	−0.2885	0.5649	0.1927	+18	−61
18 G. Libræ	6.1	1.01	8.3	20 58.3	7 33.1	−10 5.1	−0.2160	0.5652	0.1918	+21	−57
43 B. Libræ	5.7	0.97	8.6	21 2.1	11 45.2	− 6 2.4	−0.9381	0.5683	0.1826	−19	−90
47 G. Libræ	6.1	0.92	8.2	21 42.2	15 28.5	− 2 27.6	−0.9249	0.5710	0.1741	−19	−90
64 G. Libræ	5.8	+0.87	− 8.2	−22 5.3	19 30.7	+ 1 25.4	−1.2195	0.5738	−0.1644	−44	−89
153 B. Libræ	6.3	0.80	7.5	24 12.2	7 2 12.7	+ 7 51.9	−0.1219	0.5784	0.1475	+21	−51
42 Libræ	5.0	0.77	7.8	23 32.7	5 3.0	+10 35.4	−1.1976	0.5803	0.1401	−44	−90
b Scorpii	4.7	0.72	7.1	25 29.7	9 14.2	− 9 23.3	+0.2165	0.5830	0.1287	+37	−32
A Scorpii	4.6	0.71	7.3	25 4.6	10 16.4	− 8 23.5	−0.3408	0.5836	0.1258	+ 8	−65
31 B. Scorpii	5.4	+0.71	− 7.6	−24 17.0	10 23.8	− 8 16.4	−1.1599	0.5836	−0.1254	−42	−90
3 Scorpii	5.9	0.71	7.3	24 59.7	10 41.0	− 7 59.9	−0.4748	0.5838	0.1247	+ 1	−75
4 Scorpii	5.7	0.70	7.0	26 1.1	11 0.1	− 7 41.6	+0.5231	0.5840	0.1237	+54	−15
40 B. Scorpii	5.4	0.69	7.5	24 35.3	12 13.2	− 6 31.4	−1.0740	0.5848	0.1203	−35	−90
π Scorpii	3.0	0.69	7.0	25 52.3	12 18.5	− 6 26.3	+0.2159	0.5848	0.1201	+36	−32
48 B. Scorpii	4.9	+0.67	− 7.1	−25 37.9	14 3.7	− 4 45.3	−0.2347	0.5858	−0.1151	+12	−58
65 B. Scorpii	5.5	0.65	7.0	26 6.1	15 54.2	− 2 59.3	+0.0348	0.5868	0.1098	+25	−42
85 B. Scorpii	6.0	0.62	7.3	25 15.8	18 31.9	− 0 27.9	−1.0925	0.5882	0.1021	−38	−90
σ Scorpii	3.1	0.60	7.3	25 23.5	20 57.2	+ 1 51.5	−1.2015	0.5894	0.0949	−48	−87
α Scorpii	1.2	0.56	7.0	26 14.8	8 0 5.3	+ 4 52.0	−0.6181	0.5908	0.0854	−10	−90
116 B. Scorpii	6.2	+0.56	− 7.0	−26 21.3	0 50.5	+ 5 35.3	−0.5710	0.5911	−0.0831	− 8	−84

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
47 B. Arietis	6.5	+0.74	+10.2	+17 37.7	22 17 41.6	+11 45.3	+0.0639	0.5058	+0.2047	+48	−33
20 H¹. Arietis	6.4	0.76	10.0	16 49.7	18 32.1	−11 25.7	+1.1192	0.5062	0.2036	+90	+27
15 Arietis	5.9	0.75	10.8	19 6.2	19 9.4	−10 49.5	−1.2686	0.5065	0.2027	−36	−71
θ Arietis	5.6	0.80	11.0	19 30.7	23 1.8	− 7 3.9	−0.9464	0.5083	0.1975	− 9	−70
26 Arietis	6.2	0.88	11.2	19 28.9	23 5 25.2	− 0 52.0	+0.3194	0.5116	0.1882	+63	−18
ν Arietis	5.4	+0.94	+12.0	+21 35.9	9 32.1	+ 3 7.5	−1.2611	0.5138	+0.1820	−38	−68
μ Arietis	5.7	0.96	11.3	19 39.2	11 20.4	+ 4 52.5	+1.2176	0.5148	0.1792	+90	+30
ε Arietis (*mean*)	4.6	1.08	11.9	21 0.3	19 41.9	−11 1.5	+1.1626	0.5196	0.1654	+90	+36
64 Arietis	5.8	1.25	12.9	24 25.6	24 7 50.8	+ 0 44.5	−0.7480	0.5268	0.1434	+ 2	−65
7 Tauri	5.9	1.32	12.7	24 11.0	12 41.0	+ 5 25.4	+0.1928	0.5298	0.1340	+55	−18
11 Tauri	6.1	+1.37	+13.0	+25 3.5	15 39.7	+ 8 18.3	−0.3847	0.5315	+0.1280	+22	−47
16 Tauri	5.4	1.39	12.5	24 1.6	17 34.4	+10 9.2	+0.9975	0.5327	0.1241	+90	+28
17 Tauri	3.8	1.39	12.5	23 51.0	17 36.6	+10 11.4	+1.1965	0.5327	0.1240	+90	+45
18 Tauri	5.6	1.40	12.7	24 34.6	17 44.0	+10 18.5	+0.4088	0.5328	0.1238	+70	− 5
q Tauri	4.3	1.40	12.6	24 12.3	17 45.6	+10 20.0	+0.8231	0.5328	0.1237	+90	+17
20 Tauri	4.1	+1.40	+12.6	+24 6.4	18 3.2	+10 37.1	+0.9681	0.5330	+0.1231	+90	+26
21 Tauri	5.8	1.40	12.6	24 17.6	18 5.3	+10 39.1	+0.7658	0.5330	0.1231	+90	+14
22 Tauri	6.5	1.40	12.6	24 16.0	18 9.2	+10 42.9	+0.8031	0.5330	0.1229	+90	+16
14 H. Tauri	5.3	1.44	12.9	25 19.6	20 8.0	−11 22.2	−0.1294	0.5342	0.1188	+36	−32
p Tauri	5.6	1.58	12.8	26 15.8	25 5 36.2	− 2 12.9	−0.1336	0.5397	0.0983	+36	−31
φ Tauri	5.0	+1.65	+12.8	+27 9.1	9 55.7	+ 1 57.8	−0.7084	0.5421	+0.0885	+ 3	−63
χ Tauri	5.3	1.66	12.2	25 26.0	10 58.0	+ 2 58.1	+1.2757	0.5426	0.0861	+72	+59
17 B. Aurigæ	6.0	1.87	11.9	27 45.6	26 0 26.9	− 8 0.9	−0.3395	0.5493	0.0537	+24	−38
38 B. Aurigæ	6.5	1.94	11.4	27 34.9	5 40.8	− 2 58.0	+0.1033	0.5515	0.0406	+50	−13
47 B. Aurigæ	6.0	1.98	11.3	27 55.6	7 55.1	− 0 48.4	−0.1911	0.5524	0.0350	+33	−28
354 B. Tauri	6.4	+2.04	+10.8	+27 52.5	12 50.0	+ 3 56.0	+0.0074	0.5542	+0.0224	+44	−16
22 Aurigæ	6.4	2.08	10.9	28 51.6	13 51.4	+ 4 55.3	−1.0476	0.5545	0.0197	−22	−61
β Tauri	1.8	2.09	10.7	28 32.4	15 7.7	+ 6 8.8	−0.6744	0.5549	0.0164	+ 5	−57
107 B. Aurigæ	6.5	2.13	10.0	27 36.6	19 19.7	+10 11.9	+0.3865	0.5562	0.0055	+69	+ 5
112 B. Aurigæ	5.7	2.12	9.8	26 52.5	19 52.1	+10 43.1	+1.1917	0.5563	+0.0040	+86	+55
406 B. Tauri	5.6	+2.21	+ 9.3	+27 56.8	27 1 49.1	− 7 32.6	+0.0001	0.5577	−0.0117	+44	−15
136 Tauri	4.6	2.22	9.1	27 35.7	2 50.5	− 6 33.4	+0.3681	0.5579	0.0144	+68	+ 3
154 B. Aurigæ	6.4	2.26	9.2	28 55.9	4 12.7	− 5 14.2	−1.1082	0.5581	0.0181	−28	−61
415 B. Tauri	6.1	2.26	8.7	27 34.3	6 9.0	− 3 22.1	+0.3320	0.5584	0.0232	+65	+ 1
49 Aurigæ	5.1	2.42	6.8	28 5.5	20 49.5	+10 46.6	−0.8576	0.5594	0.0622	− 7	−62
54 Aurigæ	5.8	+2.44	+ 6.5	+28 20.5	22 41.4	−11 25.5	−1.2469	0.5594	−0.0671	−47	−62
39 Geminorum	6.2	2.46	4.9	26 11.7	28 7 0.7	− 3 24.3	+0.4182	0.5587	0.0889	+71	− 1
40 Geminorum	6.3	2.46	4.8	26 1.9	7 17.8	− 3 7.8	+0.5682	0.5586	0.0896	+84	+ 7
47 Geminorum	5.6	2.52	4.2	26 59.9	12 25.7	+ 1 49.0	−0.9634	0.5579	0.1027	−14	−63
52 Geminorum	6.1	2.49	3.7	25 2.1	13 53.6	+ 3 13.9	+0.9906	0.5576	0.1064	+90	+30
134 B. Geminorum	6.5	+2.54	+ 3.7	+26 50.7	14 53.0	+ 4 11.1	−1.0573	0.5574	−0.1089	−21	−63
A Geminorum	5.1	2.52	3.1	25 12.9	17 42.0	+ 6 54.1	+0.3721	0.5568	0.1159	+67	− 6
176 B. Geminorum	6.3	2.54	2.0	24 33.1	29 0 8.5	−10 53.1	+0.2835	0.5552	0.1316	+61	−12
181 B. Geminorum	6.0	2.54	1.9	24 25.0	0 33.9	−10 28.6	+0.3725	0.5551	0.1326	+67	− 8
κ Geimnorum	3.7	2.55	1.6	24 36.2	2 51.7	− 8 15.7	−0.1378	0.5544	0.1381	+36	−34
82 Geminorum	6.3	+2.53	+ 1.1	+23 21.2	4 41.1	− 6 30.1	+0.9396	0.5538	−0.1423	+90	+23
5 B. Cancri	6.4	2.56	+ 0.3	23 49.1	10 10.2	− 1 12.6	−0.3716	0.5520	0.1549	+23	−48
9 Cancri	6.2	2.55	− 0.2	22 52.7	12 31.7	+ 1 4.0	+0.2543	0.5512	0.1602	+59	−17
μ Cancri	5.5	2.52	0.4	21 49.7	13 11.4	+ 1 42.3	+1.2624	0.5510	0.1616	+83	+48
35 B. Cancri	6.4	2.57	0.7	23 23.6	15 48.6	+ 4 14.0	−0.8295	0.5500	0.1674	− 3	−67
49 B. Cancri	6.0	+2.52	− 1.3	+21 1.0	18 48.7	+ 7 7.9	+1.1785	0.5489	−0.1738	+90	+37
η Cancri	5.5	2.52	2.2	20 43.8	30 0 22.6	−11 29.7	+0.4803	0.5467	0.1851	+74	− 8
39 Cancri	6.5	2.52	2.7	20 18.5	3 43.8	− 8 15.5	+0.2935	0.5453	0.1917	+61	−18
40 Cancri	6.5	2.52	2.7	20 16.3	3 46.1	− 8 13.2	+0.3243	0.5453	0.1918	+63	−16
102 B. Cancri	6.5	2.51	2.7	19 58.2	3 51.1	− 8 8.4	+0.6260	0.5452	0.1920	+87	− 1
ε Cancri	6.3	+2.51	− 2.7	+19 50.7	3 53.5	− 8 6.1	+0.7502	0.5452	−0.1920	+90	+ 6

OCCULTATIONS

ELEMENTS FOR THE PRED

JANUARY

The Star's						Washington Mean Time.	
	Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.		
			s	″	° ′	d h m	
B.	Cancri	6.1	+2.49	− 3.5	+19 9.0	30 [illegible]	
B.	Cancri	6.4	2.41	5.5	15 43.9	22 [illegible]	
B.	Leonis	6.3	2.43	5.8	16 57.1	31 [illegible]	
	Leonis	6.2	2.38	6.4	14 45.5	[illegible]	
	Leonis	6.5	2.38	6.6	14 43.8	6 [illegible]	
	Leonis	5.6	+2.37	− 6.9	+14 24.5	9 [illegible]	
	Leonis	5.0	2.32	7.7	12 50.9	16 [illegible]	
	Leonis	4.6	2.26	8.1	10 24.7	20 [illegible]	
	Leonis	1.3	+2.29	− 8.3	+12 22.8	21 [illegible]	

FEBRUARY

	Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	
4	Leonis	5.9	+2.20	− 8.9	+ 9 12.9	1 5 15.6	
5	Leonis	5.8	2.21	9.2	10 11.6	6 24.5	
9	Leonis	3.8	2.20	9.4	9 44.5	8 55.5	
8	Leonis	5.2	+2.16	− 9.2	+ 7 23.3	9 54.6	
9	Leonis	5.7	2.18	9.4	9 5.2	10 0.8	
	Sextantis	6.3	2.12	9.8	6 49.1	15 24.6	
6	Leonis	6.1	2.09	10.1	6 38.2	20 15.8	
d	Leonis	5.0	2.04	9.9	4 4.3	22 29.5	
5	Leonis	5.4	+1.97	−10.4	+ 2 28.5	2 6 41.3	
6	Leonis	6.0	1.96	10.4	2 6.8	7 29.4	
9	Leonis	5.5	1.95	10.5	+ 1 52.3	9 59.6	
υ	Leonis	4.5	1.88	10.6	− 0 21.4	16 19.3	
8 B.	Virginis	6.5	1.71	10.6	5 15.0	3 10 28.5	
χ	Virginis	4.8	+1.60	−10.7	− 7 31.9	22 26.6	
φ	Virginis	5.0	1.52	10.6	9 4.8	4 5 33.6	
49	Virginis	5.2	1.46	10.5	10 17.3	11 52.4	
ι	Virginis	5.7	1.38	10.3	12 16.1	20 31.3	
75	Virginis	5.6	1.34	9.5	14 55.7	[illegible]	
83	Virginis	5.6	+1.30	− 9.4	−15 45.3	5 4 30	
85	Virginis	6.1	1.29	9.5	15 20.6	5 [illegible]	
43 H.	Virginis	5.5	1.15	9.1	17 48.4	18 4	
31 G.	Virginis	6.4	1.14	9.0	18 11.6	18 47	
36 G.	Virginis	5.7	1.14	9.0	18 10.5	19 28	
9 G.	Libræ	6.5	+1.06	− 8.5	−20 4.2	6 2 21	
17 G.	Libræ	6.4	1.01	8.4	20 40.1	7 7	
18 G.	Libræ	6.1	1.01	8.3	20 58.3	7 33	
43 B.	Libræ	5.7	0.97	8.6	21 2.1	11 45	
47 G.	Libræ	6.1	0.92	8.2	21 42.2	15 26	7
64 G.	Libræ	5.8	+0.87	− 8.2	−22 5.3	19 36	18
153 B.	Libræ	6.3	0.80	7.5	24 12.2	7 2 12	7
42	Libræ	5.0	0.77	7.8	23 32.7	5 3	−17
b	Scorpii	4.7	0.72	7.1	25 29.7	9 14	−16
A	Scorpii	4.6	0.71	7.3	25 4.6	10 16	0
31 B.	Scorpii	5.4	+0.71	− 7.6	−24 17.0	10 23	+ 6
3	Scorpii	5.9	0.71	7.3	24 59.7	10 41	− 5
4	Scorpii	5.7	0.70	7.0	26 1.1	11 6	+26
40 B.	Scorpii	5.4	0.69	7.5	24 [illegible]	12 11	−70
π	Scorpii	3.0	0.69	7.0	25 [illegible]	12 13	− 9
48 B.	Scorpii	4.9	−0.67	− 7.1	−25 37.9	14 1	−20
65 B.	Scorpii	5.5	0.65	7.0	26 6.1	15 54	−36
85 B.	Scorpii	6.0	0.62	7.3	25 17.8	18 21	−40
σ	Scorpii	3.1	0.60	7.3	25 2		2
α	Scorpii	1.2	0.56	7.0	26		8
116 B.	Scorpii	6.2	+0.56	− 7.0	−		

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
τ Scorpii	2.9	+0.54	− 6.4	−28 2.5	8 2 31.9	+ 7 12.6	+1.0037	0.5918	−0.0779	+62	+17
134 B. Scorpii	6.4	0.50	6.8	27 18.0	5 44.5	+10 17.3	+0.0159	0.5930	0.0680	+21	−43
135 B. Scorpii	6.0	0.50	6.4	28 21.2	5 59.7	+10 31.9	+1.0685	0.5931	0.0672	+62	+23
95 G. Ophiuchi	6.1	0.40	6.6	27 39.6	16 21.7	− 3 31.8	−0.1623	0.5957	0.0343	+ 9	−54
43 Ophiuchi	5.4	0.36	6.5	28 3.8	20 28.3	+ 0 24.6	+0.1341	0.5962	−0.0210	+23	−36
163 G. Ophiuchi	6.3	+0.29	− 6.6	−27 50.8	9 3 58.2	+ 7 35.8	−0.1530	0.5963	+0.0034	+ 7	−53
X Sagittarii (*var.*)	4.4	0.28	6.6	27 48.1	5 34.6	+ 9 8.1	−0.1889	0.5962	0.0086	+ 5	−55
4 G. Sagittarii	6.2	0.27	6.8	26 56.9	5 55.8	+ 9 28.4	−1.0538	0.5962	0.0097	−43	−90
10 G. Sagittarii	5.7	0.25	6.5	28 3.2	9 0.8	−11 34.2	+0.1169	0.5958	0.0197	+22	−37
210 B. Scorpii	5.8	0.24	6.4	28 45.1	9 44.5	−10 52.4	+0.8426	0.5957	0.0220	+61	+ 6
38 B. Sagittarii	4.7	+0.21	− 6.4	−28 28.1	13 18.5	− 7 27.2	+0.6540	0.5950	+0.0335	+56	− 6
C. D.−28° 14268	6.4	0.20	6.3	28 55.3	14 46.3	− 6 3.1	+1.1682	0.5946	0.0382	+61	+34
48 G. Sagittarii	6.3	0.18	6.5	28 19.1	16 50.2	− 4 4.2	+0.6390	0.5941	0.0447	+56	− 7
62 B. Sagittarii	6.0	0.18	6.3	28 41.0	16 50.3	− 4 4.1	+1.0107	0.5941	0.0447	+61	+18
66 B. Sagittarii	4.7	0.18	6.8	27 4.6	17 6.6	− 3 48.5	−0.6145	0.5940	0.0456	−14	−90
58 G. Sagittarii	6.1	+0.17	− 6.4	−28 28.3	18 35.4	− 2 23.3	+0.8783	0.5935	+0.0503	+62	+ 8
68 G. Sagittarii	6.2	0.15	6.8	26 41.3	20 48.0	− 0 16.2	−0.8207	0.5927	0.0572	−24	−90
69 G. Sagittarii	6.3	0.15	6.8	26 48.6	20 56.5	− 0 8.1	−0.6873	0.5927	0.0577	−17	−90
86 B. Sagittarii	6.5	0.15	6.8	26 38.3	21 16.1	+ 0 10.7	−0.8439	0.5926	0.0587	−25	−90
φ Sagittarii	3.3	0.10	6.6	27 4.9	10 3 40.1	+ 6 19.2	+0.0458	0.5898	0.0784	+23	−41
σ Sagittarii	2.1	+0.08	− 6.8	−26 24.3	7 23.9	+ 9 53.9	−0.3311	0.5879	+0.0895	+ 5	−65
201 B. Sagittarii	5.9	0.04	6.8	26 3.1	14 25.9	− 7 20.9	+0.0094	0.5838	0.1099	+24	−43
ψ Sagittarii	4.9	0.03	6.9	25 24.4	15 21.2	− 6 27.8	−0.5496	0.5833	0.1125	− 4	−82
χ Sagittarii	4.9	+0.01	7.0	24 40.6	19 13.6	− 2 44.5	−0.8410	0.5807	0.1232	−19	−90
51 Sagittarii	5.8	0.00	6.8	24 54.5	23 32.1	+ 1 23.9	−0.0486	0.5776	0.1347	+24	−47
h Sagittarii	4.7	−0.01	− 6.8	−25 4.4	23 48.2	+ 1 39.4	+0.1582	0.5774	+0.1354	+34	−35
53 Sagittarii	6.3	0.02	7.0	23 37.4	11 1 5.2	+ 2 53.4	−1.1536	0.5765	0.1387	−40	−90
274 B. Sagittarii	6.1	0.02	7.0	23 37.6	1 12.4	+ 3 0.3	−1.1348	0.5764	0.1390	−38	−90
308 B. Sagittarii	6.3	0.04	6.8	24 9.3	6 59.4	+ 8 34.0	+0.2539	0.5719	0.1535	+41	−30
329 B. Sagittarii	6.1	0.05	6.9	22 58.4	9 56.1	+11 24.1	−0.4989	0.5696	0.1605	+ 3	−76
336 B. Sagittarii	6.5	−0.06	− 6.9	−22 50.2	10 54.7	−11 39.5	−0.4822	0.5688	+0.1628	+ 5	−75
				NEW	*MOON.*						
13 Piscium	6.4	−0.09	− 1.5	− 1 33.3	15 14 42.1	−11 4.6	+0.5914	0.5014	+0.2665	+80	−14
14 Piscium	5.9	0.09	1.5	− 1 43.0	15 52.1	− 9 56.6	+1.0761	0.5011	0.2663	+88	+14
λ Piscium	4.6	−0.10	− 0.8	+ 1 18.7	20 7.2	− 5 48.7	−1.0449	0.5000	+0.2658	−13	−80
21 Piscium	5.6	0.07	0.5	0 36.2	16 0 6.1	− 1 56.6	+0.7734	0.4991	0.2650	+90	− 4
22 Piscium	5.8	0.08	0.1	2 27.5	1 27.2	− 0 37.8	−0.8649	0.4988	0.2647	− 1	−88
25 Piscium	6.2	−0.07	− 0.2	1 37.1	2 3.2	− 0 2.8	+0.1988	0.4987	0.2646	+55	−33
51 Piscium	5.6	+0.02	+ 2.3	6 29.2	23 21.2	− 3 20.6	+0.4821	0.4968	0.2553	+72	−18
136 B. Piscium	6.5	+0.03	+ 3.2	+ 8 53.5	17 4 7.5	+ 1 17.8	−0.9237	0.4970	+0.2522	− 5	−81
η Piscium	3.7	0.20	6.5	14 54.6	18 7 5.3	+ 3 29.9	−1.0079	0.5015	0.2286	−12	−75
101 Piscium	6.2	0.23	6.5	14 13.7	9 22.0	+ 5 42.6	+0.2579	0.5022	0.2261	+58	−26
105 Piscium	6.1	0.24	7.1	15 58.6	11 24.7	+ 7 41.8	−1.2040	0.5028	0.2238	−27	−74
4 Arietis	5.8	0.28	7.6	16 32.1	15 52.7	−11 58.0	−0.8311	0.5042	0.2185	0	−73
ι Arietis	5.1	+0.32	+ 8.1	+17 24.3	20 39.7	− 7 19.3	−0.7595	0.5059	+0.2126	+ 3	−73
35 B. Arietis	6.4	0.35	8.4	17 50.9	23 57.6	− 4 7.3	−0.5532	0.5072	0.2083	+14	−66
47 B. Arietis	6.5	0.38	8.4	17 37.6	19 2 3.6	− 2 4.9	+0.1238	0.5080	0.2055	+51	−30
20 H¹. Arietis	6.4	0.39	8.2	16 49.7	2 53.7	− 1 16.2	+1.1767	0.5083	0.2043	+90	+31
15 Arietis	5.9	0.38	9.0	19 6.1	3 30.8	− 0 40.2	−1.2063	0.5086	0.2035	−29	−71
θ Arietis	5.6	+0.43	+ 9.2	+19 30.7	7 21.8	+ 3 3.9	−0.8856	0.5102	+0.1981	− 5	−70
26 Arietis	6.2	0.50	9.5	19 28.9	13 43.3	+ 9 14.0	+0.3767	0.5130	0.1886	+66	−15
ν Arietis	5.4	0.54	10.4	21 35.8	17 49.2	−10 47.6	−1.2029	0.5149	0.1822	−31	−68
μ Arietis	5.7	0.58	9.8	19 39.2	19 37.1	− 9 3.0	+1.2729	0.5158	0.1793	+85	+46
ε Arietis (*mean*)	4.6	0.68	10.5	21 0.2	20 3 57.6	− 0 57.9	+1.2166	0.5198	0.1653	+90	+41
64 Arietis	5.8	+0.84	+11.8	+24 25.6	16 6.6	+10 48.1	−0.6974	0.5260	+0.1430	+ 5	−65

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
Tauri	5.9	+0.92	+11.8	+24 11.0	20 20 57.5	− 8 30.3	+0.2426	0.5286	+0.1335	+58	−15
Tauri	6.1	0.96	12.1	25 3.5	23 56.8	− 5 36.8	−0.3364	0.5301	0.1274	+25	−44
Tauri	5.4	0.99	11.7	24 1.6	21 1 51.9	− 3 45.5	+1.0468	0.5311	0.1235	+90	+32
Tauri	3.8	0.99	11.6	23 51.0	1 54.1	− 3 43.3	+1.2460	0.5311	0.1234	+83	+50
Tauri	5.6	0.99	11.9	24 34.6	2 1.5	− 3 36.2	+0.4573	0.5312	0.1231	+74	− 3
Tauri	4.3	+0.99	+11.8	+24 12.3	2 3.1	− 3 34.7	+0.8721	0.5312	+0.1231	+90	+20
Tauri	4.1	0.99	11.7	24 6.4	2 20.7	− 3 17.6	+1.0173	0.5314	0.1225	+90	+29
Tauri	5.8	1.00	11.8	24 17.6	2 22.8	− 3 15.6	+0.8146	0.5314	0.1224	+90	+17
Tauri	6.5	1.00	11.8	24 16.0	2 26.8	− 3 11.7	+0.8520	0.5314	0.1223	+90	+19
H. Tauri	5.3	1.03	12.2	25 19.6	4 26.0	− 1 16.4	−0.0822	0.5325	0.1182	+39	−30
Tauri	5.6	+1.18	+12.3	+26 15.8	13 57.2	+ 7 55.9	−0.0895	0.5372	+0.0975	+39	−28
Tauri	5.0	1.25	12.5	27 9.1	18 18.5	−11 51.5	−0.6671	0.5393	0.0877	+ 6	−60
B. Aurigæ	6.0	1.50	12.1	27 45.6	22 8 56.8	+ 2 16.9	−0.3022	0.5456	0.0531	+27	−36
B. Aurigæ	6.5	1.58	11.7	27 34.9	14 13.6	+ 7 22.7	+0.1401	0.5476	0.0401	+52	−11
B. Aurigæ	6.0	1.62	11.6	27 55.6	16 29.2	+ 9 33.6	−0.1559	0.5484	0.0345	+35	−25
B. Tauri	6.4	+1.70	+11.2	+27 52.5	21 27.1	− 9 39.0	+0.0415	0.5500	+0.0219	+46	−14
Aurigæ	6.4	1.73	11.5	28 51.6	22 29.2	− 8 39.0	−1.0170	0.5503	0.0193	−19	−61
Tauri	1.8	1.75	11.2	28 32.4	23 46.3	− 7 24.6	−0.6430	0.5507	0.0160	+ 7	−55
B. Aurigæ	6.5	1.80	10.6	27 36.6	23 4 0.9	− 3 19.0	+0.4198	0.5518	0.0051	+71	+ 7
B. Aurigæ	5.7	1.80	10.3	26 52.5	4 33.7	− 2 47.4	+1.2273	0.5519	+0.0037	+80	+58
5 B. Tauri	5.6	+1.91	+10.0	+27 56.8	10 34.6	+ 3 0.7	+0.0301	0.5532	−0.0119	+46	−14
6 Tauri	4.6	1.92	9.9	27 35.8	11 36.7	+ 4 0.6	+0.3989	0.5534	0.0146	+70	+ 5
4 B. Aurigæ	6.4	1.96	10.1	28 56.0	12 59.7	+ 5 20.6	−1.0824	0.5537	0.0182	−25	−61
5 B. Tauri	6.1	1.97	9.5	27 34.3	14 57.3	+ 7 14.1	+0.3616	0.5540	0.0233	+67	+ 2
9 Aurigæ	5.1	2.20	7.9	28 5.5	24 5 47.2	− 2 27.7	−0.8356	0.5551	0.0620	− 5	−62
4 Aurigæ	5.8	+2.23	+ 7.7	+28 20.5	7 40.2	− 0 38.7	−1.2263	0.5551	−0.0669	−42	−62
9 Geminorum	6.2	2.29	5.9	26 11.7	16 4.3	+ 7 27.3	+0.4403	0.5547	0.0885	+72	0
0 Geminorum	6.3	2.30	5.8	26 1.9	16 21.7	+ 7 44.1	+0.5905	0.5547	0.0892	+86	+ 8
7 Geminorum	5.6	2.38	5.4	26 59.9	21 32.2	−11 16.5	−0.9452	0.5541	0.1023	−12	−63
2 Geminorum	6.1	2.36	4.6	25 2.1	23 0.8	− 9 50.9	+1.0116	0.5539	0.1060	+90	+32
4 B. Geminorum	6.5	+2.41	+ 4.9	+26 50.7	25 0 0.7	− 8 53.2	−1.0397	0.5538	−0.1084	−19	−63
4 Geminorum	5.1	2.40	4.0	25 13.0	2 51.0	− 6 8.9	+0.3910	0.5534	0.1155	+69	− 5
6 B. Geminorum	6.3	2.45	2.9	24 33.1	9 20.1	+ 0 6.4	+0.3006	0.5522	0.1312	+62	−11
1 B. Geminorum	6.0	2.46	2.8	24 25.0	9 45.5	+ 0 30.9	+0.3894	0.5521	0.1322	+68	− 7
κ Geminorum	3.7	2.48	2.5	24 36.2	12 4.1	+ 2 44.6	−0.1218	0.5516	0.1376	+37	−33
2 Geminorum	6.3	+2.47	+ 1.9	+23 21.2	13 54.1	+ 4 30.8	+0.9555	0.5512	−0.1419	+90	+24
5 B. Geminorum	6.4	2.53	1.1	23 49.1	19 24.6	+ 9 49.7	−0.3571	0.5498	0.1545	+24	−48
9 Cancri	6.2	2.53	0.6	22 52.7	21 46.6	−11 53.2	+0.2681	0.5492	0.1598	+60	−16
μ Cancri	5.5	2.51	0.2	21 49.8	22 26.4	−11 14.8	+1.2755	0.5491	0.1613	+81	+50
5 B. Cancri	6.4	2.57	+ 0.1	23 23.7	26 1 4.0	− 8 42.6	−0.8155	0.5483	0.1670	− 2	−67
9 B. Cancri	6.0	+2.54	− 0.8	+21 1.0	4 4.4	− 5 48.4	+1.1895	0.5474	−0.1735	+90	+38
η Cancri	5.5	2.57	1.8	20 43.8	9 38.5	− 0 25.8	+0.4909	0.5458	0.1850	+76	− 7
39 Cancri	6.5	2.58	2.4	20 18.5	12 59.5	+ 2 48.2	+0.3037	0.5447	0.1917	+62	−17
40 Cancri	6.5	2.58	2.4	20 16.3	13 1.8	+ 2 50.5	+0.3345	0.5447	0.1918	+64	−16
2 B. Cancri	6.5	2.58	2.5	19 58.2	13 6.8	+ 2 55.3	+0.6354	0.5447	0.1920	+88	0
ε Cancri	6.3	+2.58	− 2.5	+19 50.7	13 9.2	+ 2 57.7	+0.7594	0.5447	−0.1921	+90	+ 6
39 B. Cancri	6.1	2.59	3.4	19 9.0	17 50.5	+ 7 29.3	+0.5676	0.5432	0.2011	+81	− 5
27 B. Cancri	6.4	2.58	6.0	15 43.9	27 7 54.0	− 2 55.5	+1.1314	0.5390	0.2256	+90	+26
12 B. Leonis	6.3	2.61	6.2	16 57.1	9 52.7	− 1 0.8	−0.5887	0.5384	0.2287	+13	−70
7 Leonis	6.2	2.58	7.1	14 45.5	14 42.7	+ 3 39.6	+0.5675	0.5370	0.2360	+80	− 9
11 Leonis	6.5	+2.58	− 7.3	+14 43.8	15 42.8	+ 4 37.8	+0.3589	0.5368	−0.2375	+65	−20
φ Leonis	5.6	2.58	7.7	14 24.5	18 23.1	+ 7 12.8	+0.0518	0.5360	0.2413	+46	−36
ν Leonis	5.0	2.57	8.8	12 50.9	28 1 12.7	−10 11.1	−0.0127	0.5344	0.2502	+43	−40
A Leonis	4.6	2.53	9.6	10 24.7	5 48.5	− 5 44.2	+1.3348	0.5334	0.2556	+84	+42
α Leonis	1.3	2.56	9.5	12 22.8	6 1.3	− 5 31.9	−0.7470	0.5334	0.2559	+ 5	−78
44 Leonis	5.9	+2.52	−10.7	+ 9 12.9	14 2.9	+ 2 14.1	+0.4198	0.5320	−0.2642	+68	−20

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
45 Leonis	5.8	+2.54	−10.8	+10 11.6	28 15 10.9	+ 3 19.9	−0.8842	0.5318	−0.2652	− 3	−80
ρ Leonis	3.8	2.53	11.1	9 44.5	17 38.7	+ 5 42.9	−1.0761	0.5314	0.2674	−15	−80
48 Leonis	5.2	2.49	11.3	7 23.3	18 36.7	+ 6 39.1	+1.0742	0.5314	0.2682	+90	+16
49 Leonis	5.7	+2.52	−11.3	+ 9 5.2	18 42.8	+ 6 45.0	−0.6913	0.5313	−0.2683	+ 8	−81
MARCH.											
37 Sextantis	6.3	+2.49	−11.9	+ 6 49.1	1 0 0.2	+11 52.2	+0.1984	0.5308	−0.2724	+55	−32
56 Leonis	6.1	2.48	12.5	6 38.2	4 45.1	− 7 32.1	−0.9161	0.5305	0.2754	− 5	−83
d Leonis	5.0	2.44	12.7	4 4.2	6 55.9	− 5 25.5	+1.0960	0.5304	0.2767	+90	+16
75 Leonis	5.4	+2.41	−13.5	+ 2 28.5	14 56.1	+ 2 19.3	+0.4869	0.5305	−0.2802	+73	−19
76 Leonis	6.0	2.41	13.6	2 6.8	15 43.1	+ 3 4.8	+0.6344	0.5306	0.2805	+84	−11
79 Leonis	5.5	2.40	13.8	+ 1 52.2	18 9.9	+ 5 26.9	+0.1926	0.5307	0.2812	+54	−24
υ Leonis	4.5	2.37	14.2	− 0 21.5	2 0 19.5	+11 24.6	+0.7139	0.5314	0.2823	+90	− 7
9 B. Virginis	6.2	2.36	14.6	+ 0 9.0	6 4.4	− 7 1.7	−1.4228	0.5323	0.2825	−52	−72
78 B. Virginis	6.5	+2.27	−14.9	− 5 15.0	17 58.5	+ 4 29.2	+0.6753	0.5351	−0.2801	+84	− 9
χ Virginis	4.8	2.21	15.2	7 31.9	3 5 35.8	− 8 16.6	−0.2537	0.5392	0.2742	+29	−58
ψ Virginis	5.0	2.18	15.2	9 4.9	12 31.2	− 1 35.1	−0.5770	0.5421	0.2689	+12	−80
49 Virginis	5.2	2.14	15.2	10 17.4	18 39.4	+ 4 20.6	−0.9957	0.5451	0.2631	−12	−90
i Virginis	5.7	2.09	15.0	12 16.2	4 3 4.1	−11 32.2	−1.1828	0.5495	0.2535	−28	−90
75 Virginis	5.6	+2.07	−14.4	−14 55.8	5 45.9	− 8 56.1	+0.8080	0.5511	−0.2500	+75	− 1
83 Virginis	5.6	2.04	14.3	15 45.4	10 51.2	− 4 1.4	+0.3829	0.5541	0.2427	+59	−24
85 Virginis	6.1	2.04	14.4	15 20.7	11 20.0	− 3 33.6	−0.1457	0.5543	0.2420	+30	−52
43 H. Virginis	5.5	1.95	13.8	17 48.5	5 0 6.0	+ 8 44.7	−0.6310	0.5623	0.2205	+ 3	−87
231 G. Virginis	6.4	1.95	13.6	18 11.7	0 47.7	+ 9 24.8	−0.3965	0.5627	0.2192	+15	−68
236 G. Virginis	5.7	+1.94	−13.6	−18 19.6	1 27.6	+10 3.2	−0.4096	0.5632	−0.2179	+14	−69
9 G. Libræ	6.5	1.90	13.0	20 4.2	8 12.7	− 7 26.7	−0.0851	0.5675	0.2045	+29	−49
17 G. Libræ	6.4	1.86	12.8	20 49.2	12 52.8	− 2 57.1	−0.2634	0.5705	0.1944	+10	−59
18 G. Libræ	6.1	1.86	12.7	20 58.3	13 18.2	− 2 32.6	−0.1923	0.5708	0.1935	+22	−55
43 B. Libræ	5.7	1.84	12.8	21 2.2	17 26.0	+ 1 25.8	−0.9076	0.5734	0.1841	−17	−90
47 G. Libræ	6.1	+1.80	−12.2	−21 42.3	21 5.9	+ 4 57.2	−0.8944	0.5757	−0.1753	−17	−90
64 G. Libræ	5.8	1.77	12.0	22 5.3	6 1 4.6	+ 8 46.7	−1.1871	0.5780	0.1654	−40	−90
153 B. Libræ	6.3	1.72	11.1	24 12.3	7 41.9	− 8 51.5	−0.0955	0.5818	0.1482	+22	−40
42 Libræ	5.0	1.69	11.2	23 32.7	10 30.5	− 6 9.7	−1.1658	0.5833	0.1406	−41	−90
b Scorpii	4.7	1.66	10.3	25 29.8	14 39.5	− 2 10.6	+0.2424	0.5853	0.1290	+39	−30
A Scorpii	4.6	+1.65	−10.4	−25 4.6	15 41.3	− 1 11.2	−0.3126	0.5858	−0.1261	+ 9	−65
31 B. Scorpii	5.4	1.64	10.7	24 17.0	15 48.5	− 1 4.3	−1.1287	0.5859	0.1258	−39	−90
3 Scorpii	5.9	1.65	10.4	24 59.7	16 5.7	− 0 47.9	−0.4460	0.5860	0.1250	+ 2	−73
4 Scorpii	5.7	1.65	10.0	26 1.1	16 24.6	− 0 29.7	+0.5482	0.5862	0.1240	+55	−13
40 B. Scorpii	5.4	1.63	10.5	24 35.4	17 37.2	+ 0 40.0	−1.0432	0.5867	0.1206	−33	−90
π Scorpii	3.0	+1.64	−10.1	−25 52.4	17 42.5	+ 0 45.1	+0.2423	0.5867	−0.1203	+38	−30
48 B. Scorpii	4.9	1.62	10.1	25 37.9	19 27.1	+ 2 25.5	−0.2066	0.5875	0.1153	+14	−50
65 B. Scorpii	5.5	1.60	9.8	26 6.1	21 17.0	+ 4 10.9	+0.0623	0.5882	0.1099	+27	−40
85 B. Scorpii	6.0	1.57	10.0	25 15.9	23 54.0	+ 6 41.5	−1.0621	0.5892	0.1021	−36	−90
σ Scorpii	3.1	1.55	9.8	25 23.6	7 2 18.7	+ 9 0.4	−1.1711	0.5900	0.0949	−46	−90
α Scorpii	1.2	+1.52	− 9.3	−26 14.8	5 26.5	−11 59.5	−0.5889	0.5910	−0.0853	− 9	−80
116 B. Scorpii	6.2	1.51	9.3	26 21.4	6 11.6	−11 16.3	−0.5418	0.5912	0.0830	− 7	−81
τ Scorpii	2.9	1.51	8.6	28 2.6	7 53.0	− 9 39.0	+1.0315	0.5917	0.0778	+62	+20
134 B. Scorpii	6.4	1.47	8.6	27 18.0	11 5.5	− 6 34.4	+0.0448	0.5924	0.0678	+22	−41
135 B. Scorpii	6.0	1.47	8.2	28 21.3	11 20.8	− 6 19.7	+1.0971	0.5924	0.0670	+62	+20
95 G. Ophiuchi	6.1	+1.36	− 7.9	−27 39.6	21 44.7	+ 3 38.5	−0.1329	0.5936	−0.0341	+11	−52
43 Ophiuchi	5.4	1.31	7.5	28 3.8	8 1 52.8	+ 7 36.4	+0.1642	0.5935	−0.0209	+25	−34
163 G. Ophiuchi	6.3	1.23	7.1	27 50.8	9 26.5	− 9 8.6	−0.1234	0.5927	+0.0034	+ 8	−51
X Sagittarii (*var.*)	4.4	1.21	7.0	27 48.1	11 3.9	− 7 35.2	−0.1594	0.5924	0.0085	+ 7	−53
4 G. Sagittarii	6.2	1.20	7.3	26 56.9	11 25.3	− 7 14.7	−1.0275	0.5923	0.0097	−42	−90
o G. Sagittarii	5.7	+1.17	− 6.7	−28 3.2	14 32.3	− 4 15.3	+0.1475	0.5916	+0.0196	+23	−35

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
B. Scorpii	5.8	+1.17	− 6.4	−28 45.1	8 15 16.5	− 3 33.0	+0.8762	0.5914	+0.0219	+61	+ 8
B. Sagittarii	4.7	1.13	6.2	28 28.1	18 53.1	− 0 5.2	+0.6871	0.5903	0.0332	+59	− 4
C. D.–28° 14268	6.4	1.11	6.0	28 55.3	20 22.1	+ 1 20.1	+1.2039	0.5898	0.0379	+61	+39
G. Sagittarii	6.3	1.09	6.1	28 19.1	22 27.7	+ 3 20.7	+0.6724	0.5890	0.0443	+58	− 5
B. Sagittarii	6.0	1.09	5.9	28 41.0	22 27.9	+ 3 20.9	+1.0459	0.5890	0.0443	+61	+21
B. Sagittarii	4.7	+1.07	− 6.5	−27 4.6	22 44.4	+ 3 36.6	−0.5877	0.5889	+0.0452	−12	−86
G. Sagittarii	6.1	1.07	5.9	28 28.3	9 0 14.4	+ 5 3.1	+0.9130	0.5883	0.0498	+62	+11
G. Sagittarii	6.2	1.03	6.4	26 41.3	2 29.1	+ 7 12.3	−0.7954	0.5874	0.0567	−23	−90
G. Sagittarii	6.3	1.03	6.3	26 48.6	2 37.7	+ 7 20.5	−0.6613	0.5873	0.0571	−16	−90
B. Sagittarii	6.5	1.02	6.4	26 38.3	2 57.5	+ 7 39.5	−0.8188	0.5871	0.0581	−24	−90
Sagittarii	3.3	+0.96	− 5.8	−27 4.8	9 27.8	−10 5.8	+0.0756	0.5839	+0.0775	+25	−39
Sagittarii	2.1	0.91	5.7	26 24.3	13 15.6	− 6 27.0	−0.3042	0.5817	0.0885	+ 6	−63
B. Sagittarii	5.9	0.84	5.4	26 3.1	20 25.5	+ 0 26.1	+0.0380	0.5772	0.1085	+26	−42
Sagittarii	4.9	0.82	5.5	25 24.3	21 21.8	+ 1 20.2	−0.5254	0.5766	0.1110	− 3	−80
Sagittarii	4.9	0.78	5.5	24 40.6	10 1 18.8	+ 5 8.1	−0.8198	0.5738	0.1216	−18	−90
Sagittarii	5.8	+0.74	− 5.1	−24 54.4	5 42.7	+ 9 21.9	−0.0218	0.5706	+0.1328	+25	−45
h Sagittarii	4.7	0.74	5.1	25 4.4	5 59.2	+ 9 37.9	+0.1867	0.5704	0.1335	+36	−33
3 Sagittarii	6.3	0.71	5.4	23 37.4	7 17.8	+10 53.5	−1.1366	0.5694	0.1368	−38	−90
4 B. Sagittarii	6.1	0.71	5.4	23 37.6	7 25.1	+11 0.5	−1.1175	0.5693	0.1371	−36	−90
8 B. Sagittarii	6.3	0.66	4.9	24 9.3	13 19.6	− 7 18.2	+0.2820	0.5648	0.1513	+43	−28
9 B. Sagittarii	6.1	+0.62	− 5.0	−22 58.4	16 20.1	− 4 24.4	−0.4781	0.5624	+0.1583	+ 5	−75
6 B. Sagittarii	6.5	0.61	5.0	22 50.2	17 20.0	− 3 26.7	−0.4616	0.5616	0.1605	+ 6	−73
4 Capricorni	5.7	0.56	4.8	22 4.5	23 28.3	+ 2 28.4	−0.2273	0.5567	0.1738	+19	−57
6 B. Capricorni	6.2	0.52	4.3	22 40.5	11 4 28.9	+ 7 18.2	+1.2956	0.5526	0.1839	+67	+44
9 Capricorni	5.7	0.40	4.7	18 14.8	15 50.9	− 5 43.4	−1.1181	0.5435	0.2045	−29	−90
σ Capricorni	6.2	+0.40	− 4.3	−19 22.0	18 1.5	− 3 37.2	+0.5028	0.5418	+0.2081	+62	−17
1 Capricorni	6.5	0.38	4.6	17 51.8	18 37.4	− 3 2.5	−0.9461	0.5413	0.2090	−16	−90
θ Capricorni	4.2	0.37	4.5	17 34.4	20 57.8	− 0 46.9	−0.7590	0.5395	0.2127	− 4	−90
URANUS	6.0	. . .	. . .	17 18.1	23 7.0	+ 1 18.0	−0.5828	0.5358	0.2154	+ 6	−82
4 B. Capricorni	6.1	0.34	4.2	17 41.9	12 1 13.5	+ 3 20.3	+0.2929	0.5362	0.2190	+52	−28
30 Capricorni	5.4	+0.34	− 3.9	−18 20.6	2 33.1	+ 4 37.3	+1.2622	0.5352	+0.2209	+72	+35
31 Capricorni	6.3	0.34	4.0	17 49.2	2 42.0	+ 4 45.9	+0.7463	0.5351	0.2211	+72	− 3
ι Capricorni	4.3	0.32	4.1	17 11.9	4 35.1	+ 6 35.4	+0.5123	0.5336	0.2237	+65	−17
42 Capricorni	5.1	0.24	4.0	14 25.7	13 51.5	− 8 26.1	−0.2736	0.5270	0.2353	+25	−59
44 Capricorni	6.0	0.24	3.9	14 47.4	14 35.4	− 7 43.6	+0.2802	0.5265	0.2361	+54	−29
45 Capricorni	5.8	+0.25	− 3.8	−15 8.4	15 2.7	− 7 17.2	+0.7579	0.5262	+0.2366	+75	− 4
51 B. Capricorni	6.1	0.22	3.9	13 7.2	17 49.8	− 4 35.4	−0.7112	0.5244	0.2396	+ 2	−90
μ Capricorni	5.2	0.22	− 3.7	13 57.2	19 34.8	− 2 53.7	+0.5897	0.5232	0.2414	+73	−13
MERCURY	0.7	. . .	. . .	−12 53.8	20 35.9	− 1 54.4	−0.2820	0.4962	0.2427	+26	−60
				NEW	*MOON.*						
η Piscium	3.7	0.00	+ 4.7	+14 54.6	17 15 6.0	−10 41.6	−1.0811	0.5042	+0.2291	−17	−75
01 Piscium	6.2	+0.02	4.8	14 13.7	17 22.1	− 8 29.4	+0.1837	0.5049	0.2266	+54	−30
05 Piscium	6.1	0.02	5.2	15 58.6	19 24.2	− 6 30.9	−1.2798	0.5055	0.2243	−35	−74
4 Arietis	5.8	0.04	5.6	16 32.1	23 50.9	− 2 12.0	−0.9095	0.5070	0.2191	− 6	−73
ι Arietis	5.1	+0.06	+ 6.1	+17 24.3	18 4 36.5	+ 2 25.3	−0.8409	0.5087	+0.2131	− 2	−73
35 B. Arietis	6.4	0.08	6.4	17 50.8	7 53.5	+ 5 36.5	−0.6365	0.5099	0.2088	+10	−71
47 B. Arietis	6.5	0.10	6.4	17 37.6	9 58.8	+ 7 38.0	+0.0394	0.5107	0.2059	+46	−34
20 H¹. Arietis	6.4	0.11	6.3	16 49.7	10 48.7	+ 8 26.5	+1.0920	0.5110	0.2048	+90	+24
15 Arietis	5.9	0.10	6.8	19 6.1	11 25.7	+ 9 2.4	−1.2919	0.5112	0.2039	−39	−71
θ Arietis	5.6	+0.13	+ 7.2	+19 30.6	15 15.5	−11 14.7	−0.9733	0.5128	+0.1985	−11	−70
26 Arietis	6.2	0.18	7.6	19 28.8	21 35.5	− 5 6.2	+0.2860	0.5154	0.1889	+60	−19
γ Arietis	5.4	0.20	8.4	21 35.8	19 1 40.5	− 1 8.6	−1.2965	0.5172	0.1825	−43	−68
μ Arietis	5.7	0.24	8.0	19 39.1	3 28.1	+ 0 35.7	+1.1798	0.5180	0.1795	+90	+36
ε Arietis (*mean*)	4.6	0.31	8.7	21 0.2	11 47.3	+ 8 39.4	+1.1200	0.5217	0.1653	+90	+32
64 Arietis	5.8	+0.43	+10.1	+24 25.6	23 55.5	− 3 35.3	−0.8012	0.5272	+0.1428	− 2	−66

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
7 Tauri	5.9	+0.49	+10.1	+24 11.0	20 4 46.5	+ 1 6.5	+0.1385	0.5295	+0.1333	+52	−20
11 Tauri	6.1	0.52	10.5	25 3.5	7 46.0	+ 4 0.2	−0.4427	0.5308	0.1272	+19	−50
16 Tauri	5.4	0.55	10.2	24 1.5	9 41.3	+ 5 51.7	+0.9429	0.5316	0.1232	+90	+25
17 Tauri	3.8	0.55	10.1	23 51.0	9 43.5	+ 5 53.9	+1.1425	0.5317	0.1231	+90	+40
18 Tauri	5.6	0.55	10.4	24 34.6	9 50.9	+ 6 1.0	+0.3521	0.5317	0.1229	+66	− 8
q Tauri	4.3	+0.56	+10.2	+24 12.3	9 52.5	+ 6 2.5	+0.7678	0.5317	+0.1228	+90	+14
20 Tauri	4.1	0.56	10.2	24 6.3	10 10.2	+ 6 19.7	+0.9131	0.5318	0.1222	+90	+23
21 Tauri	5.8	0.56	10.3	24 17.6	10 12.3	+ 6 21.8	+0.7100	0.5319	0.1221	+90	+10
22 Tauri	6.5	0.56	10.3	24 16.0	10 16.3	+ 6 25.6	+0.7475	0.5319	0.1220	+90	+13
η Tauri	3.0	0.57	10.2	23 50.8	10 57.3	+ 7 5.3	+1.2966	0.5322	0.1206	+70	+59
14 H. Tauri	5.3	+0.58	+10.6	+25 19.6	12 15.8	+ 8 21.2	−0.1895	0.5328	+0.1178	+33	−35
p Tauri	5.6	0.72	11.0	26 15.8	21 49.0	− 6 24.5	−0.1996	0.5368	0.0971	+32	−34
φ Tauri	5.0	0.78	11.3	27 9.1	21 2 11.6	− 2 10.6	−0.7801	0.5385	0.0873	− 1	−63
χ Tauri	5.3	0.80	10.8	25 26.0	3 14.7	− 1 9.7	+1.2144	0.5389	0.0849	+85	+50
17 B. Aurigæ	6.0	1.01	11.3	27 45.6	16 56.4	−11 55.8	−0.4174	0.5436	0.0527	+20	−42
38 B. Aurigæ	6.5	+1.09	+11.0	+27 34.9	22 16.3	− 6 46.8	+0.0261	0.5451	+0.0397	+45	−16
47 B. Aurigæ	6.0	1.13	11.1	27 55.6	22 0 33.4	− 4 34.4	−0.2716	0.5457	0.0341	+28	−32
354 B. Tauri	6.4	1.20	10.9	27 52.5	5 34.8	+ 0 16.5	−0.0737	0.5468	0.0217	+39	−20
22 Aurigæ	6.4	1.23	11.2	28 51.6	6 37.6	+ 1 17.2	−1.1380	0.5470	0.0190	−31	−61
β Tauri	1.8	1.25	11.0	28 32.4	7 55.7	+ 2 32.6	−0.7622	0.5473	0.0158	− 1	−61
107 B. Aurigæ	6.5	+1.31	+10.4	+27 36.6	12 13.7	+ 6 41.6	+0.3063	0.5480	+0.0050	+63	+ 1
112 B. Aurigæ	5.7	1.31	10.1	26 52.5	12 46.9	+ 7 13.6	+1.1185	0.5481	+0.0036	+90	+49
406 B. Tauri	5.6	1.42	10.1	27 56.8	18 53.0	−10 53.0	−0.0859	0.5490	−0.0118	+39	−21
136 Tauri	4.6	1.43	9.9	27 35.8	19 56.0	− 9 52.2	+0.2853	0.5491	0.0145	+62	− 1
154 B. Aurigæ	6.4	1.47	10.3	28 56.0	21 20.3	− 8 30.9	−1.2054	0.5492	0.0181	−40	−61
415 B. Tauri	6.1	+1.49	+ 9.7	+27 34.3	23 19.8	− 6 35.6	+0.2478	0.5494	−0.0231	+59	− 4
49 Aurigæ	5.1	1.73	8.5	28 5.5	23 14 24.9	+ 7 57.8	−0.9566	0.5496	0.0613	−14	−62
37 Geminorum	5.7	1.83	6.6	25 29.1	23 21.4	− 7 24.5	+1.2338	0.5489	0.0835	+82	+53
39 Geminorum	6.2	1.86	6.7	26 11.7	24 0 53.5	− 5 55.6	+0.3301	0.5487	0.0873	+64	− 5
40 Geminorum	6.3	1.86	6.6	26 1.9	1 11.2	− 5 38.4	+0.4814	0.5487	0.0880	+76	+ 2
47 Geminorum	5.6	+1.96	+ 6.3	+26 59.9	6 27.8	− 0 32.8	−1.0645	0.5480	−0.1009	−22	−63
52 Geminorum	6.1	1.95	5.5	25 2.1	7 58.1	+ 0 54.3	+0.9072	0.5478	0.1045	+90	+25
134 B. Geminorum	6.5	1.99	6.0	26 50.7	8 59.2	+ 1 53.3	−1.1591	0.5477	0.1069	−31	−63
A Geminorum	5.1	2.00	5.1	25 13.0	11 52.9	+ 4 41.0	+0.2830	0.5471	0.1138	+61	−10
176 B. Geminorum	6.3	2.08	4.0	24 33.1	18 29.7	+11 4.0	+0.1939	0.5458	0.1293	+55	−17
181 B. Geminorum	6.0	+2.08	+ 3.9	+24 25.0	18 55.7	+11 29.1	+0.2836	0.5457	−0.1303	+61	−12
κ Geminorum	3.7	2.12	3.7	24 36.2	21 17.0	−10 14.5	−0.2304	0.5453	0.1356	+31	−30
82 Geminorum	6.3	2.12	3.0	23 21.2	23 9.2	− 8 26.1	+0.8554	0.5448	0.1399	+90	+18
5 B. Cancri	6.4	2.20	2.4	23 49.1	25 4 46.2	− 3 0.7	−0.4644	0.5435	0.1523	+18	−54
9 Cancri	6.2	2.21	1.8	22 52.8	7 10.8	− 0 41.0	+0.1663	0.5430	0.1575	+53	−21
μ Cancri	5.5	+2.19	+ 1.3	+21 49.8	7 51.4	− 0 1.8	+1.1810	0.5428	−0.1589	+90	+30
35 B. Cancri	6.4	2.26	1.5	23 23.7	10 32.0	+ 2 33.2	−0.9232	0.5421	0.1646	− 9	−67
49 B. Cancri	6.0	2.24	+ 0.2	21 1.0	13 35.9	+ 5 31.0	+1.0970	0.5413	0.1710	+90	+31
η Cancri	5.5	2.30	− 0.6	20 43.8	19 16.0	+10 59.7	+0.3968	0.5399	0.1824	+68	−12
39 Cancri	6.5	2.32	1.3	20 18.5	22 40.5	− 9 42.8	+0.2105	0.5390	0.1890	+56	−22
40 Cancri	6.5	+2.32	− 1.3	+20 16.3	22 42.9	− 9 40.4	+0.2415	0.5390	−0.1891	+58	−20
102 B. Cancri	6.5	2.32	1.4	19 58.3	22 48.0	− 9 35.5	+0.5443	0.5390	0.1893	+70	− 5
ε Cancri	6.3	2.32	1.4	19 50.7	22 50.4	− 9 33.1	+0.6690	0.5390	0.1894	+90	+ 1
139 B. Cancri	6.1	2.35	2.3	19 9.0	26 3 36.5	− 4 56.7	+0.4790	0.5378	0.1983	+74	−10
227 B. Cancri	6.4	2.41	5.3	15 43.7	17 52.4	+ 8 50.9	+1.0557	0.5346	0.2228	+90	+21
12 B. Leonis	6.3	+2.45	− 5.2	+16 57.1	19 52.6	+10 47.2	−0.6698	0.5342	−0.2260	+ 8	−73
7 Leonis	6.2	2.45	6.5	14 45.5	27 0 46.0	− 8 29.0	+0.4952	0.5322	0.2334	+74	−13
11 Leonis	6.5	2.45	6.6	14 43.8	1 46.7	− 7 30.2	+0.2868	0.5330	0.2348	+60	−24
ψ Leonis	5.6	2.47	7.1	14 24.5	4 28.7	− 4 53.5	−0.0187	0.5326	0.2387	+43	−39
ν Leonis	5.0	2.49	8.4	12 50.9	11 21.8	+ 1 46.2	−0.0762	0.5317	0.2478	+40	−44
A Leonis	4.6	+2.47	− 9.5	+10 24.7	15 59.4	+ 6 14.8	+1.2783	0.5312	−0.2534	+90	+36

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
α Leonis	1.3	+2.51	− 9.1	+12 22.8	27 16 12.3	+ 6 27.3	−0.8060	0.5312	−0.2536	+ 1	−78
44 Leonis	5.9	2.50	10.8	9 12.9	28 0 15.8	− 9 44.9	+0.3712	0.5307	0.2623	+65	−23
45 Leonis	5.8	2.53	10.7	10 11.6	1 24.0	− 8 38.9	−0.9312	0.5306	0.2634	− 6	−80
ρ Leonis	3.8	2.53	11.1	9 44.5	3 52.0	− 6 15.7	−1.1194	0.5306	0.2657	−19	−80
48 Leonis	5.2	2.50	11.7	7 23.3	4 50.1	− 5 19.4	+1.0306	0.5306	0.2666	+90	+13
49 Leonis	5.7	+2.52	−11.4	+ 9 5.2	4 56.1	− 5 13.6	−0.7335	0.5307	−0.2667	+ 6	−80
37 Sextantis	6.3	2.52	12.4	6 49.1	10 13.4	− 0 6.5	+0.1623	0.5307	0.2710	+52	−34
56 Leonis	6.1	2.54	13.0	6 38.1	14 57.6	+ 4 28.5	−0.9433	0.5311	0.2744	− 6	−83
d Leonis	5.0	2.51	13.6	4 4.2	17 7.9	+ 6 34.6	+1.0664	0.5313	0.2757	+90	+14
75 Leonis	5.4	2.52	14.6	2 28.4	29 1 5.1	− 9 43.6	+0.4697	0.5325	0.2798	+72	−19
76 Leonis	6.0	+2.52	−14.7	+ 2 6.8	1 51.7	− 8 58.5	+0.6176	0.5326	−0.2801	+83	−12
79 Leonis	5.5	2.53	15.0	+ 1 52.2	4 17.2	− 6 37.7	+0.1812	0.5331	0.2810	+54	−34
υ Leonis	4.5	2.52	15.7	− 0 21.5	10 23.0	− 0 43.8	+0.7081	0.5345	0.2825	+88	− 7
9 B. Virginis	6.2	2.54	16.1	+ 0 9.0	16 3.4	+ 4 45.4	−1.4060	0.5362	0.2831	−48	−76
78 B. Virginis	6.5	2.53	17.2	− 5 15.1	30 3 45.7	− 7 55.6	+0.6939	0.5406	0.2815	+85	− 8
χ Virginis	4.8	+2.54	−17.9	− 7 32.0	15 8.4	+ 3 4.0	−0.2092	0.5460	−0.2761	+31	−55
ψ Virginis	5.0	2.54	18.1	9 5.0	21 53.8	+ 9 35.4	−0.5185	0.5497	0.2712	+15	−75
49 Virginis	5.2	2.54	18.2	10 17.5	31 3 52.3	− 8 38.6	−0.9229	0.5533	0.2656	− 8	−90
i Virginis	5.7	2.54	18.2	12 16.2	12 2.9	− 0 45.4	−1.0952	0.5586	0.2562	−21	−90
75 Virginis	5.6	2.54	18.0	14 55.9	14 39.9	+ 1 45.9	+0.8722	0.5603	0.2527	+75	+ 3
83 Virginis	5.6	+2.54	−17.8	−15 45.4	19 36.0	+ 6 31.2	+0.4592	0.5637	−0.2456	+63	−20
85 Virginis	6.1	+2.54	−17.9	−15 20.7	20 3.9	+ 6 58.2	−0.0613	0.5640	−0.2448	+35	−47

APRIL.

43 H. Virginis	5.5	+2.53	−17.3	−17 48.6	1 8 25.6	− 5 7.9	−0.5240	0.5727	−0.2233	+ 8	−77
231 G. Virginis	6.4	2.53	17.2	18 11.7	9 6.0	− 4 29.0	−0.2922	0.5732	0.2220	+20	−61
236 G. Virginis	5.7	2.53	17.2	18 19.6	9 44.6	− 3 51.9	−0.3043	0.5737	0.2207	+19	−61
9 G. Libræ	6.5	2.53	16.6	20 4.3	16 16.4	+ 2 24.9	+0.0226	0.5783	0.2071	+34	−42
17 G. Libræ	6.4	2.53	16.2	20 49.2	20 47.2	+ 6 45.1	−0.1483	0.5813	0.1969	+25	−52
18 G. Libræ	6.1	+2.53	−16.2	−20 58.4	21 11.9	+ 7 8.9	−0.0779	0.5816	−0.1960	+28	−48
43 B. Libræ	5.7	2.54	16.4	21 2.3	2 1 11.5	+10 59.0	−0.7781	0.5843	0.1864	−10	−90
47 G. Libræ	6.1	2.51	15.5	21 42.4	4 44.0	− 9 37.0	−0.7617	0.5866	0.1776	−10	−90
64 G. Libræ	5.8	2.50	15.2	22 5.4	8 35.0	− 5 55.3	−1.0464	0.5889	0.1675	−29	−90
153 B. Libræ	6.3	2.49	14.2	24 12.3	14 59.3	+ 0 13.4	+0.0337	0.5925	0.1500	+29	−42
42 Libræ	5.0	+2.47	−14.1	−23 32.8	17 42.5	+ 2 49.9	−1.0181	0.5939	−0.1422	−29	−90
b Scorpii	4.7	2.47	13.2	25 29.8	21 43.8	+ 6 41.3	+0.3718	0.5957	0.1305	+45	−23
A Scorpii	4.6	2.46	13.2	25 4.7	22 43.6	+ 7 38.6	−0.1742	0.5962	0.1275	+16	−54
31 B. Scorpii	5.4	2.45	13.4	24 17.1	22 50.6	+ 7 45.3	−0.9780	0.5962	0.1271	−28	−90
3 Scorpii	5.9	2.46	13.2	24 59.8	23 7.3	+ 8 1.3	−0.3054	0.5963	0.1263	+10	−62
4 Scorpii	5.7	+2.47	−12.9	−26 1.2	23 25.6	+ 8 18.8	+0.6743	0.5964	−0.1254	+62	− 6
40 B. Scorpii	5.4	2.45	13.1	24 35.4	3 0 36.0	+ 9 26.4	−0.8927	0.5970	0.1218	−23	−90
π Scorpii	3.0	2.46	12.8	25 52.4	0 41.1	+ 9 31.3	+0.3738	0.5970	0.1216	+45	−23
48 B. Scorpii	4.9	2.45	12.7	25 38.0	2 22.5	+11 8.5	−0.0672	0.5977	0.1165	+21	−47
50 B. Scorpii	6.4	2.43	13.0	24 29.8	2 36.0	+11 21.4	−1.2248	0.5977	0.1158	−50	−84
65 B. Scorpii	5.5	+2.44	−12.3	−26 6.2	4 9.1	−11 9.4	+0.1989	0.5982	−0.1110	+34	−32
85 B. Scorpii	6.0	2.42	12.3	25 15.9	6 41.4	− 8 43.5	−0.9077	0.5991	0.1031	−25	−90
σ Scorpii	3.1	2.40	12.0	25 23.6	9 2.0	− 6 28.8	−1.0138	0.5997	0.0957	−33	−90
α Scorpii	1.2	2.39	11.4	26 14.8	12 4.4	− 3 34.0	−0.4381	0.6004	0.0860	− 1	−72
116 B. Scorpii	6.2	2.39	11.3	26 21.4	12 48.3	− 2 52.0	−0.3913	0.6006	0.0837	+ 1	−69
τ Scorpii	2.9	+2.40	−10.6	−28 2.6	14 26.8	− 1 17.6	+1.1613	0.6009	−0.0784	+62	+33
134 B. Scorpii	6.4	2.36	10.5	27 18.0	17 34.1	+ 1 41.7	+0.1900	0.6013	0.0683	+30	−33
135 B. Scorpii	6.0	2.38	10.1	28 21.3	17 49.0	+ 1 56.0	+1.2284	0.6013	0.0674	+62	+42
118 B. Ophiuchi	6.2	2.28	9.7	26 24.1	4 1 55.7	+ 9 42.0	−1.1681	0.6016	0.0408	−50	−90
95 G. Ophiuchi	6.1	2.28	9.0	27 39.6	3 57.3	+11 38.5	+0.0196	0.6014	0.0341	+18	−43
36 Oph. (*1st star*)	5.4	+2.24	− 9.6	−26 28.9	5 4.4	−11 17.3	−1.2009	0.6013	−0.0304	−54	−85

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
43 Ophiuchi	5.4	+2.25	-8.4	-28 3.8	4 7 59.7	- 8 29.3	+0.3149	0.6009	-0.0207	+33	-26
163 G. Ophiuchi	6.3	2.17	7.5	27 50.8	15 23.9	- 1 23.9	+0.0333	0.5991	+0.0037	-16	-42
X Sagittarii (*var.*)	4.4	2.15	7.3	27 48.1	16 59.3	+ 0 7.6	-0.0019	0.5985	0.0089	+15	-44
4 G. Sagittarii	6.2	2.13	7.6	26 56.9	17 20.3	+ 0 27.6	-0.8609	0.5984	0.0100	-31	-90
10 G. Sagittarii	5.7	2.12	6.8	28 3.2	20 23.9	+ 3 23.6	+0.3030	0.5973	0.0200	+32	-26
210 B. Scorpii	5.8	+2.12	-6.4	-28 45.1	21 7.3	+ 4 5.2	+1.0249	0.5970	+0.0223	+61	+20
38 B. Sagittarii	4.7	2.08	6.0	28 28.1	5 0 40.3	+ 7 29.4	+0.8390	0.5954	0.0337	+62	+ 6
48 G. Sagittarii	6.3	2.04	5.7	28 19.1	4 11.5	+10 51.9	+0.8256	0.5936	0.0448	+62	+ 5
62 B. Sagittarii	6.0	2.04	5.5	28 41.0	4 11.7	+10 52.0	+1.1960	0.5936	0.0448	+61	+35
66 B. Sagittarii	4.7	2.01	6.0	27 4.5	4 27.9	+11 7.5	-0.4236	0.5935	0.0456	- 4	-71
58 G. Sagittarii	6.1	+2.02	-5.4	-28 28.3	5 56.7	-11 27.3	+1.0648	0.5927	+0.0503	+62	+23
68 G. Sagittarii	6.2	1.96	5.7	26 41.3	8 9.5	- 9 20.0	-0.6293	0.5914	0.0571	-14	-90
69 G. Sagittarii	6.3	1.96	5.6	26 48.6	8 18.0	- 9 11.7	-0.4962	0.5913	0.0575	- 6	-77
86 B. Sagittarii	6.5	1.95	5.6	26 38.3	8 37.5	- 8 53.1	-0.6524	0.5910	0.0585	-15	-90
φ Sagittarii	3.3	1.89	4.6	27 4.8	15 3.1	- 2 43.1	+0.2359	0.5870	0.0778	+33	-30
σ Sagittarii	2.1	+1.83	-4.4	-26 24.3	18 48.6	+ 0 53.4	-0.1411	0.5843	+0.0888	+15	-52
201 B. Sagittarii	5.9	1.74	3.6	26 3.1	6 1 55.1	+ 7 43.0	+0.1991	0.5789	0.1086	+34	-32
ψ Sagittarii	4.9	1.72	3.8	25 24.3	2 51.1	+ 8 36.8	-0.3614	0.5781	0.1111	+ 6	-66
χ Sagittarii	4.9	1.66	3.6	24 40.5	6 46.8	-11 36.6	-0.6550	0.5748	0.1215	- 9	-90
49 Sagittarii	5.5	1.64	3.7	24 7.8	6 52.8	-11 30.9	-1.2032	0.5747	0.1217	-46	-88
51 Sagittarii	5.8	+1.61	-3.0	-24 54.4	11 9.6	- 7 23.9	+0.1391	0.5711	+0.1326	+34	-36
h Sagittarii	4.7	1.61	2.9	25 4.4	11 26.0	- 7 8.1	+0.3469	0.5708	0.1333	+45	-24
53 Sagittarii	6.3	1.57	3.2	23 37.4	12 44.5	- 5 52.5	-0.9722	0.5697	0.1365	-26	-90
274 B. Sagittarii	6.1	1.57	3.2	23 37.5	12 51.7	- 5 45.6	-0.9531	0.5696	0.1368	-25	-90
308 B. Sagittarii	6.3	1.50	2.5	24 9.2	18 45.7	- 0 4.8	+0.4410	0.5644	0.1508	+52	-10
329 B. Sagittarii	6.1	+1.45	-2.4	-22 58.3	21 46.2	+ 2 49.0	-0.3183	0.5617	+0.1575	+13	-03
336 B. Sagittarii	6.5	1.44	2.4	22 50.1	22 46.2	+ 3 46.8	-0.3022	0.5608	0.1597	+14	-62
4 Capricorni	5.7	1.36	2.0	22 4.4	7 4 55.1	+ 9 42.4	-0.0706	0.5552	0.1727	+27	-48
19 Capricorni	5.7	1.13	1.6	18 14.8	21 22.8	+ 1 35.9	-0.9711	0.5407	0.2026	-17	-90
20 Capricorni	6.2	1.12	1.0	19 21.9	23 34.5	+ 3 43.2	+0.6506	0.5388	0.2061	+69	- 9
21 Capricorni	6.5	+1.09	-1.4	-17 51.8	8 0 10.6	+ 4 18.0	-0.8010	0.5383	+0.2070	- 7	-90
θ Capricorni	4.2	1.07	1.3	17 34.3	2 32.1	+ 6 34.8	-0.6154	0.5363	0.2105	+ 4	-85
114 B. Capricorni	6.1	1.02	0.9	17 41.8	6 50.2	+10 44.4	+0.4355	0.5328	0.2167	+60	-20
Uranus	6.0	. . .	. . .	16 58.8	6 51.7	+10 45.9	-0.3138	0.5314	0.2164	+20	-62
31 Capricorni	6.3	1.01	0.7	17 49.2	8 19.6	-11 49.0	+0.8888	0.5316	0.2187	+72	+ 5
ι Capricorni	4.3	+0.98	-0.7	-17 11.8	10 13.8	- 9 58.5	+0.6527	0.5302	+0.2212	+72	- 0
42 Capricorni	5.1	0.86	0.8	14 25.6	19 36.2	- 0 54.0	-0.1440	0.5232	0.2324	+31	-51
44 Capricorni	6.0	0.86	0.6	14 47.3	20 20.6	- 0 11.1	+0.4110	0.5226	0.2332	+61	-22
45 Capricorni	5.8	0.86	0.4	15 8.4	20 48.3	+ 0 15.8	+0.8901	0.5223	0.2337	+75	+ 5
151 B. Capricorni	6.1	0.82	0.8	13 7.2	23 37.3	+ 2 59.6	-0.5875	0.5204	0.2366	+ 9	-82
μ Capricorni	5.2	+0.82	-0.4	-13 57.2	9 1 23.6	+ 4 42.5	+0.7166	0.5192	+0.2383	+76	- 6
e Aquarii	5.4	0.72	0.2	11 59.0	10 9.0	-10 48.0	+0.7474	0.5138	0.2458	+78	- 4
150 B. Aquarii	6.0	0.66	0.7	9 27.8	13 22.0	- 7 40.8	-1.1422	0.5119	0.2483	-23	-90
167 G. Aquarii	6.3	0.57	0.1	8 20.4	10 0 30.7	+ 3 8.3	+0.4613	0.5064	0.2550	+68	-20
67 Aquarii	6.4	0.55	0.1	7 24.5	3 4.8	+ 5 37.9	+0.1205	0.5053	0.2563	+49	-37
252 B. Aquarii	5.8	+0.49	-0.1	- 5 26.4	9 24.7	+11 46.8	-0.3605	0.5028	+0.2587	+24	-64
197 G. Aquarii	6.3	0.48	0.0	5 15.9	10 32.2	-11 7.6	-0.2590	0.5024	0.2591	+30	-59
263 B. Aquarii	6.1	0.46	+0.2	5 10.1	12 48.0	- 8 55.6	+0.2249	0.5017	0.2598	+55	-32
293 B. Aquarii	5.5	0.41	0.4	3 57.6	20 20.9	- 1 35.6	+0.8916	0.4995	0.2614	+86	+ 3
13 Piscium	6.4	0.34	0.7	1 33.3	11 5 14.0	+ 7 2.6	+0.6211	0.4976	0.2619	+83	-12
14 Piscium	5.9	+0.34	+0.8	- 1 43.0	6 25.2	+ 8 11.8	+1.1073	0.4974	+0.2619	+88	+17
λ Piscium	4.6	0.29	0.6	+ 1 18.7	10 44.4	-11 36.2	-1.0436	0.4968	0.2616	-13	-86
21 Piscium	5.6	0.28	1.0	0 36.3	14 46.7	- 7 40.7	+0.7802	0.4965	0.2611	+90	- 3
22 Piscium	5.8	0.26	0.8	2 27.5	16 8.9	- 6 20.7	-0.8752	0.4963	0.2609	- 2	-88
25 Piscium	6.2	+0.26	+1.0	+ 1 37.1	16 45.5	- 5 45.1	+0.1958	0.4962	+0.2608	+54	-33

NEW MOON.

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
ε Arietis (*mean*)	4.6	+0.16	+7.2	+21 0.2	15 18 43.0	− 6 37.2	+0.9826	0.5236	+0.1644	+90	+23
4 Arietis	5.8	0.22	8.3	24 25.6	16 6 50.7	+ 5 7.5	−0.9587	0.5292	0.1419	−11	−66
7 Tauri	5.9	0.26	8.4	24 10.9	11 41.6	+ 9 49.1	−0.0233	0.5313	0.1323	+42	−28
1 Tauri	6.1	0.28	8.7	25 3.5	14 41.0	−11 17.3	−0.6095	0.5326	0.1262	+10	−60
6 Tauri	5.4	0.30	8.6	24 1.5	16 36.3	− 9 25.8	+0.7769	0.5334	0.1223	+90	+14
7 Tauri	3.8	+0.31	+8.5	+23 51.0	16 38.5	− 9 23.6	+0.9770	0.5334	+0.1222	+90	+27
8 Tauri	5.6	0.30	8.7	24 34.6	16 45.9	− 9 16.4	+0.1846	0.5335	0.1219	+55	−17
q Tauri	4.3	0.31	8.6	24 12.2	16 47.6	− 9 14.7	+0.6012	0.5335	0.1219	+86	+ 5
10 Tauri	4.1	0.31	8.6	24 6.3	17 5.2	− 8 57.8	+0.7465	0.5336	0.1213	+90	+13
11 Tauri	5.8	0.31	8.6	24 17.5	17 7.3	− 8 55.7	+0.5430	0.5336	0.1212	+81	+ 2
22 Tauri	6.5	+0.31	+8.6	+24 16.0	17 11.3	− 8 51.9	+0.5804	0.5337	+0.1210	+84	+ 4
23 Tauri	4.3	0.31	8.5	23 41.2	17 19.7	− 8 43.8	+1.2411	0.5337	0.1208	+84	+50
η Tauri	3.0	0.32	8.6	23 50.7	17 52.3	− 8 12.2	+1.1299	0.5340	0.1196	+90	+39
27 Tauri	3.7	0.32	8.6	23 47.8	18 39.8	− 7 26.2	+1.2781	0.5343	0.1180	+76	+56
28 Tauri	5.2	0.32	8.6	23 52.8	18 40.4	− 7 25.6	+1.1865	0.5343	0.1180	+90	+44
14 H. Tauri	5.3	+0.32	+8.8	+25 19.6	19 10.8	− 6 56.2	−0.3610	0.5345	+0.1169	+23	−45
p Tauri	5.6	0.41	9.3	26 15.8	17 4 44.6	+ 2 18.7	−0.3820	0.5382	0.0962	+22	−44
φ Tauri	5.0	0.46	9.6	27 9.1	9 7.6	+ 6 33.0	−0.9689	0.5397	0.0863	−15	−63
χ Tauri	5.3	0.47	9.2	25 25.9	10 10.8	+ 7 34.1	+1.0303	0.5401	0.0839	+90	+35
17 B. Aurigæ	6.0	0.63	9.9	27 45.5	23 55.3	− 3 9.3	−0.6198	0.5440	0.0517	+ 8	−56
38 B. Aurigæ	6.5	+0.70	+9.8	+27 34.9	18 5 16.8	+ 2 1.3	−0.1794	0.5452	+0.0388	+33	−27
47 B. Aurigæ	6.0	0.72	9.8	27 55.6	7 34.7	+ 4 14.4	−0.4803	0.5456	0.0332	+16	−45
54 B. Tauri	6.4	0.79	9.8	27 52.5	12 38.2	+ 9 7.5	−0.2856	0.5464	0.0208	+27	−32
β Tauri	1.8	0.83	9.8	28 32.4	15 0.1	+11 24.6	−0.9793	0.5467	0.0150	−16	−61
07 B. Aurigæ	6.5	0.88	9.4	27 36.6	19 20.2	− 8 24.3	+0.0913	0.5471	0.0042	+49	− 9
12 B. Aurigæ	5.7	+0.89	+9.2	+26 52.5	19 53.7	− 7 52.0	+0.9073	0.5471	+0.0028	+90	+34
106 B. Tauri	5.6	0.98	9.4	27 56.8	19 2 3.3	− 1 55.1	−0.3077	0.5475	−0.0125	+26	−32
36 Tauri	4.6	0.99	9.2	27 35.7	3 7.0	− 0 53.6	+0.0649	0.5475	0.0151	+47	−12
115 B. Tauri	6.1	1.04	9.0	27 34.3	6 33.0	+ 2 25.3	+0.0252	0.5475	0.0237	+45	−15
49 Aurigæ	5.1	1.26	8.3	28 5.5	21 50.2	− 6 49.2	−1.1963	0.5464	0.0614	−38	−62
37 Geminorum	5.7	+1.36	+6.8	+25 29.1	20 6 55.6	+ 1 57.4	+1.0077	0.5449	−0.0832	+90	+33
39 Geminorum	6.2	1.39	6.9	26 11.7	8 29.4	+ 3 28.0	+0.0959	0.5446	0.0869	+49	−17
40 Geminorum	6.3	1.39	6.8	26 1.9	8 47.4	+ 3 45.4	+0.2484	0.5445	0.0876	+59	−10
52 Geminorum	6.1	1.48	5.8	25 2.1	15 41.9	+10 25.8	+0.6762	0.5430	0.1037	+90	+11
A Geminorum	5.1	1.53	5.6	25 13.0	19 41.4	− 9 42.9	+0.0456	0.5420	0.1129	+46	−22
176 B. Geminorum	6.3	+1.62	+4.6	+24 33.2	21 2 26.7	− 3 11.3	−0.0453	0.5403	−0.1279	+41	−29
181 B. Geminorum	6.0	1.62	4.6	24 25.0	2 53.2	− 2 45.7	+0.0453	0.5402	0.1289	+46	−24
187 B. Geminorum	6.3	1.61	4.1	23 13.0	3 43.3	− 1 57.3	+1.2402	0.5399	0.1307	+84	+49
κ Geminorum	3.7	1.65	4.4	24 36.2	5 17.7	− 0 26.0	−0.4742	0.5395	0.1341	+17	−53
82 Geminorum	6.3	1.66	3.8	23 21.2	7 12.4	+ 1 24.8	+0.6225	0.5389	0.1382	+88	+ 4
5 B. Cancri	6.4	+1.74	+3.3	+23 49.1	12 57.3	+ 6 58.1	−0.7107	0.5373	−0.1503	+ 4	−66
9 Cancri	6.2	1.76	2.7	22 52.8	15 25.5	+ 9 21.4	−0.0732	0.5366	0.1554	+39	−33
μ Cancri	5.5	1.75	2.2	21 49.8	16 7.1	+10 1.6	+0.9523	0.5363	0.1568	+90	+22
35 B. Cancri	6.4	1.81	2.5	23 23.7	18 51.6	−11 19.3	−1.1740	0.5355	0.1623	−30	−67
49 B. Cancri	6.0	1.82	1.3	21 1.0	22 0.1	− 8 17.0	+0.8687	0.5346	0.1685	+90	+15
η Cancri	5.5	+1.88	+0.5	+20 43.8	22 3 48.9	− 2 39.6	+0.1623	0.5329	−0.1796	+53	−24
39 Cancri	6.5	1.92	0.0	20 18.5	7 18.8	+ 0 43.4	−0.0247	0.5319	0.1860	+42	−34
40 Cancri	6.5	1.92	0.0	20 16.3	7 21.3	+ 0 45.9	+0.0066	0.5319	0.1861	+44	−32
102 B. Cancri	6.5	1.91	−0.2	19 58.3	7 26.5	+ 0 50.9	+0.3128	0.5319	0.1862	+62	−17
ε Cancri	6.3	1.91	0.2	19 50.8	7 29.0	+ 0 53.3	+0.4390	0.5319	0.1863	+71	−11
139 B. Cancri	6.1	+1.96	−1.1	+19 9.0	12 22.6	+ 5 37.4	+0.2490	0.5305	−0.1950	+58	−21
227 B. Cancri	6.4	2.06	4.0	15 43.9	23 3 1.6	− 4 11.9	+0.8415	0.5270	0.2188	+90	+ 7
12 B. Leonis	6.3	2.10	3.8	16 57.1	5 5.0	− 2 12.5	−0.9018	0.5266	0.2219	− 6	−73
7 Leonis	6.2	2.12	5.2	14 45.5	10 6.3	+ 2 39.3	+0.2808	0.5258	0.2290	+59	−24
11 Leonis	6.5	2.13	5.3	14 43.8	11 8.6	+ 3 39.6	+0.0710	0.5256	0.2305	+47	−34
ϕ Leonis	5.6	+2.15	−5.7	+14 24.6	13 54.9	+ 6 20.7	−0.2350	0.5252	−0.2342	+31	−51

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S
		s	″	° ′	d h m	h m				°	°
ν Leonis	5.0	+2.20	− 7.1	+12 50.9	23 20 58.8	−10 48.9	+0.2852	0.5244	−0.2432	+29	−55
A Leonis	4.6	2.20	8.4	10 24.7	24 1 43.4	− 6 13.1	+1.0895	0.5241	0.2486	+90	+19
α Leonis	1.3	2.23	7.8	12 22.9	1 56.6	− 6 0.4	−1.0164	0.5240	0.2489	−12	−78
44 Leonis	5.9	2.27	9.8	9 12.9	10 11.8	+ 1 59.3	+0.1848	0.5240	0.2574	+54	−32
45 Leonis	5.8	2.29	9.6	10 11.6	11 21.6	+ 3 6.9	−1.1285	0.5240	0.2585	−20	−80
ρ Leonis	3.8	+2.31	−10.0	+ 9 44.5	13 53.0	+ 5 33.5	−1.3144	0.5240	−0.2608	−37	−80
48 Leonis	5.2	2.28	10.8	7 23.3	14 52.4	+ 6 31.0	+0.8576	0.5242	0.2617	+90	+ 3
49 Leonis	5.7	2.31	10.3	9 5.2	14 58.6	+ 6 37.1	−0.9230	0.5242	0.2618	− 6	−81
37 Sextantis	6.3	2.32	11.6	6 49.1	20 22.7	+11 50.9	−0.0097	0.5247	0.2662	+43	−43
56 Leonis	6.1	2.36	12.1	6 38.2	25 1 12.7	− 7 28.3	−1.1158	0.5253	0.2696	−18	−83
d Leonis	5.0	+2.35	−13.0	+ 4 4.2	3 25.5	− 5 19.6	+0.9144	0.5258	−0.2709	+90	+ 5
75 Leonis	5.4	2.40	14.3	2 28.5	11 31.2	+ 2 30.6	+0.3283	0.5276	0.2752	+62	−26
76 Leonis	6.0	2.40	14.4	2 6.8	12 18.5	+ 3 16.4	+0.4788	0.5278	0.2756	+72	−19
79 Leonis	5.5	2.42	14.7	+ 1 52.2	14 46.3	+ 5 39.5	+0.0446	0.5286	0.2765	+46	−41
υ Leonis	4.5	2.44	15.7	− 0 21.5	20 57.2	+11 38.5	+0.5878	0.5306	0.2783	+80	−13
78 B. Virginis	6.5	+2.53	−17.9	− 5 15.1	26 14 29.6	+ 4 36.6	+0.6128	0.5388	−0.2781	+81	−11
χ Virginis	4.8	2.61	18.8	7 32.0	27 1 54.4	− 8 21.8	−0.2634	0.5458	0.2735	+28	−55
ψ Virginis	5.0	2.65	19.3	9 5.0	8 39.3	− 1 50.9	−0.5547	0.5505	0.2690	+13	−78
49 Virginis	5.2	2.69	19.5	10 17.5	14 36.4	+ 3 53.7	−0.9421	0.5549	0.2638	− 9	−90
i Virginis	5.7	2.74	19.8	12 16.3	22 43.4	+11 43.2	−1.0912	0.5614	0.2549	−21	−90
75 Virginis	5.6	+2.76	−19.9	−14 55.9	28 1 18.9	− 9 47.0	+0.8742	0.5636	−0.2516	+75	+ 4
83 Virginis	5.6	2.80	19.9	15 45.4	6 11.7	− 5 5.0	+0.4751	0.5676	0.2447	+64	−18
85 Virginis	6.1	2.80	19.8	15 20.8	6 39.2	− 4 38.5	−0.0413	0.5680	0.2440	+35	−46
43 H. Virginis	5.5	2.88	19.4	17 48.6	18 49.5	+ 7 4.1	−0.4699	0.5786	0.2231	+11	−73
231 G. Virginis	6.4	2.88	19.4	18 11.8	19 29.2	+ 7 42.3	−0.2385	0.5793	0.2218	+22	−57
236 G. Virginis	5.7	+2.89	−19.4	−18 19.7	20 7.1	+ 8 18.7	−0.2489	0.5797	−0.2206	+22	−58
9 G. Libræ	6.5	2.94	18.9	20 4.3	29 2 31.2	− 9 32.2	+0.0904	0.5852	0.2072	+38	−38
17 G. Libræ	6.4	2.96	18.6	20 49.3	6 56.1	− 5 17.9	−0.0685	0.5889	0.1971	+28	−47
18 G. Libræ	6.1	2.96	18.5	20 58.4	7 20.2	− 4 54.7	+0.0022	0.5892	0.1961	+32	−43
43 B. Libræ	5.7	3.00	18.8	21 2.3	11 14.3	− 1 10.1	−0.6814	0.5923	0.1866	− 4	−90
47 G. Libræ	6.1	+3.00	−17.8	−21 42.4	14 41.6	+ 2 8.7	−0.6572	0.5950	−0.1778	− 4	−90
64 G. Libræ	5.8	3.02	17.4	22 5.4	18 26.6	+ 5 44.4	−0.9300	0.5978	0.1678	−21	−90
153 B. Libræ	6.3	3.06	16.4	24 12.4	30 0 40.6	+11 42.7	+0.1498	0.6021	0.1502	+35	−35
42 Libræ	5.0	3.06	16.2	23 32.8	3 19.2	− 9 45.4	−0.8826	0.6037	0.1424	−21	−90
b Scorpii	4.7	3.09	15.4	25 29.9	7 13.4	− 6 1.1	+0.4961	0.6059	0.1306	+53	−16
A Scorpii	4.6	+3.09	−15.3	−25 4.7	8 11.5	− 5 5.6	−0.0403	0.6064	−0.1276	+23	−46
31 B. Scorpii	5.4	3.08	15.3	24 17.1	8 18.3	− 4 59.0	−0.8326	0.6065	0.1273	−19	−90
3 Scorpii	5.9	3.09	15.2	24 59.8	8 34.4	− 4 43.6	−0.1689	0.6066	0.1264	+16	−54
4 Scorpii	5.7	3.10	15.1	26 1.2	8 52.2	− 4 26.5	+0.7975	0.6068	0.1255	+64	+ 2
40 B. Scorpii	5.4	3.08	15.1	24 35.5	10 0.5	− 3 21.2	−0.7450	0.6074	0.1219	−14	−90
π Scorpii	3.0	+3.10	−14.9	−25 52.5	10 5.5	− 3 16.4	+0.5035	0.6074	−0.1217	+53	−15
48 B. Scorpii	4.9	3.10	14.7	25 38.0	11 43.8	− 1 42.4	+0.0719	0.6081	0.1165	+28	−39
50 B. Scorpii	6.4	3.08	14.8	24 29.8	11 56.9	− 1 29.8	−1.0683	0.6082	0.1158	−36	−90
65 B. Scorpii	5.5	3.11	14.4	26 6.2	13 27.1	− 0 3.5	+0.3374	0.6089	0.1110	+41	−25
85 B. Scorpii	6.0	3.09	14.1	25 15.9	15 54.8	+ 2 17.8	−0.7482	0.6099	0.1030	−16	−90
σ Scorpii	3.1	+3.09	−13.7	−25 23.6	18 10.9	+ 4 28.0	−0.8484	0.6107	−0.0956	−23	−90
α Scorpii	1.2	3.10	13.1	26 14.9	21 7.5	+ 7 17.0	−0.2761	0.6116	0.0858	+ 7	−60
116 B. Scorpii	6.2	+3.11	−12.9	−26 21.4	21 50.0	+ 7 57.6	−0.2287	0.6117	−0.0834	+ 9	−57

MAY.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S
134 B. Scorpii	6.4	+3.11	−12.0	−27 18.0	1 2 26.6	−11 37.9	+0.3514	0.6127	−0.0678	+39	−24
118 B. Ophiuchi	6.2	3.07	10.7	26 24.1	10 31.7	− 3 54.1	−0.9715	0.6131	0.0399	−35	−90
95 G. Ophiuchi	6.1	3.08	10.0	27 39.6	12 29.3	− 2 1.5	+0.2000	0.6129	0.0331	+28	−32
36 Oph. (1*st star*)	5.4	3.04	10.4	26 28.9	13 34.1	− 0 59.7	−0.9990	0.6128	0.0294	−38	−90
43 Ophiuchi	5.4	+3.08	− 9.2	−28 3.8	16 23.6	+ 1 42.4	+0.4964	0.6124	−0.0196	+44	−15

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
3 G. Ophiuchi	6.3	+3.03	-7.8	-27 50.8	1 23 33.1	+ 8 33.2	+0.2299	0.6104	+0.0051	+27	-30
Sagittarii (*var.*)	4.4	3.02	7.5	27 48.1	2 1 5.4	+10 1.5	+0.1975	0.6099	0.0103	+25	-32
4 G. Sagittarii	6.2	2.99	7.7	26 56.9	1 25.7	+10 20.8	-0.6469	0.6098	0.0115	-18	-90
0 G. Sagittarii	5.7	3.00	6.8	28 3.2	4 23.3	-10 49.3	+0.5020	0.6085	0.0216	+44	-15
0 B. Scorpii	5.8	3.01	6.4	28 45.1	5 5.3	-10 9.1	+1.2130	0.6082	0.0239	+61	+41
8 B. Sagittarii	4.7	+2.97	-5.8	-28 28.1	8 31.3	- 6 51.9	+1.0348	0.6064	+0.0355	+62	+21
8 G. Sagittarii	6.3	2.94	5.3	28 19.1	11 55.7	- 3 36.3	+1.0261	0.6045	0.0466	+62	+20
6 B. Sagittarii	4.7	2.91	5.5	27 4.5	12 11.6	- 3 21.1	-0.2025	0.6043	0.0476	+ 8	-56
8 G. Sagittarii	6.1	2.93	4.8	28 28.2	13 37.6	- 1 58.8	+1.2637	0.6034	0.0522	+62	+52
8 G. Sagittarii	6.2	2.86	4.9	26 41.2	15 46.1	+ 0 4.3	-0.4005	0.6020	0.0592	- 1	-69
9 G. Sagittarii	6.3	+2.87	-4.8	-26 48.6	15 54.4	+ 0 12.3	-0.2694	0.6019	+0.0596	+ 5	-60
6 B. Sagittarii	6.5	2.86	4.8	26 38.3	16 13.3	+ 0 30.4	-0.4228	0.6017	0.0606	- 2	-71
φ Sagittarii	3.3	2.81	3.5	27 4.8	22 27.0	+ 6 28.4	+0.4588	0.5971	0.0800	+46	-18
σ Sagittarii	2.1	2.75	3.0	26 24.3	3 2 5.7	+ 9 58.1	+0.0917	0.5941	0.0910	+27	-38
52 B. Sagittarii	6.4	2.70	3.2	24 59.5	3 17.3	+11 6.7	-1.2202	0.5931	0.0946	-51	-85
27 G. Sagittarii	6.4	+2.70	-3.0	-25 3.7	4 4.6	+11 52.2	-1.0747	0.5924	+0.0969	-37	-90
72 B. Sagittarii	5.8	2.68	2.9	24 57.9	4 51.8	-11 22.6	-1.0949	0.5918	0.0992	-39	-90
89 B. Sagittarii	6.1	2.66	2.6	24 47.5	7 5.2	- 9 14.6	-1.0444	0.5897	0.1056	-34	-90
01 B. Sagittarii	5.9	2.66	1.8	26 3.0	8 59.8	- 7 24.6	+0.4340	0.5880	0.1110	+47	-19
ψ Sagittarii	4.9	2.64	1.9	25 24.3	9 54.2	- 6 32.5	-0.1174	0.5871	0.1135	+18	-50
08 B. Sagittarii	6.1	+2.62	-2.2	-24 19.5	9 55.3	- 6 31.4	-1.2067	0.5871	+0.1135	-48	-88
χ Sagittarii	4.9	2.58	1.4	24 40.5	13 43.4	- 2 52.3	-0.4034	0.5835	0.1238	+ 5	-69
49 Sagittarii	5.5	2.56	1.6	24 7.8	13 49.2	- 2 46.8	-0.9436	0.5834	0.1241	-26	-90
51 Sagittarii	5.8	2.53	0.6	24 54.4	17 59.2	+ 1 13.4	+0.3831	0.5794	0.1350	+47	-22
h Sagittarii	4.7	2.53	0.5	25 4.3	18 15.2	+ 1 28.7	+0.5882	0.5791	0.1356	+59	-11
53 Sagittarii	6.3	+2.48	-0.7	-23 37.3	19 31.6	+ 2 42.1	-0.7116	0.5778	+0.1388	-10	-90
74 B. Sagittarii	6.1	2.48	-0.7	23 37.5	19 38.6	+ 2 48.8	-0.6926	0.5777	0.1391	- 9	-90
08 B. Sagittarii	6.3	2.42	+0.3	24 9.2	4 1 23.8	+ 8 20.8	+0.6868	0.5718	0.1530	+65	- 5
29 B. Sagittarii	6.1	2.36	0.5	22 58.3	4 20.1	+11 10.4	-0.0607	0.5688	0.1597	+26	-47
36 B. Sagittarii	6.5	2.34	0.7	22 50.1	5 18.6	-11 53.2	-0.0441	0.5678	0.1619	+27	-46
4 Capricorni	5.7	+2.26	+1.3	-22 4.4	11 19.4	- 6 5.8	+0.1880	0.5615	+0.1747	+40	-33
81 B. Capricorni	6.4	2.01	2.0	18 21.0	5 1 1.5	+ 7 7.0	-1.0844	0.5475	0.2000	-27	-90
19 Capricorni	5.7	1.98	2.3	18 14.7	3 28.7	+ 9 29.2	-0.6984	0.5451	0.2039	- 1	-90
20 Capricorni	6.2	1.98	3.0	19 21.9	5 38.2	+11 34.2	+0.9081	0.5430	0.2073	+71	+ 7
21 Capricorni	6.5	1.94	2.5	17 51.7	6 13.8	-11 51.4	-0.5300	0.5424	0.2082	+ 8	-77
θ Capricorni	4.2	+1.91	+2.7	-17 34.2	8 33.2	- 9 36.7	-0.3461	0.5402	+0.2117	+18	-64
114 B. Capricorni	6.1	1.86	3.3	17 41.8	12 47.7	- 5 30.7	+0.6955	0.5362	0.2175	+72	- 6
URANUS	6.0	...	...	16 48.5	14 0.1	- 4 20.6	+0.0329	0.5346	0.2190	+38	-42
31 Capricorni	6.3	1.85	3.5	17 49.1	14 15.9	- 4 5.4	+1.1451	0.5348	0.2195	+72	+24
ι Capricorni	4.3	1.81	3.5	17 11.8	16 8.7	- 2 16.2	+0.9109	0.5331	0.2219	+73	+ 7
42 Capricorni	5.1	+1.66	+3.5	-14 25.6	6 1 25.1	+ 6 42.2	+0.1179	0.5252	+0.2325	+45	-37
44 Capricorni	6.0	1.66	3.8	14 47.3	2 9.1	+ 7 24.9	+0.6690	0.5246	0.2333	+75	- 8
45 Capricorni	5.8	1.66	4.0	15 8.3	2 36.5	+ 7 51.4	+1.1448	0.5242	0.2337	+75	+22
151 B. Capricorni	6.1	1.60	3.6	13 7.1	5 24.1	+10 33.8	-0.3247	0.5220	0.2365	+23	-62
μ Capricorni	5.2	1.60	4.0	13 57.1	7 9.5	-11 44.1	+0.9709	0.5207	0.2381	+76	+10
ε Aquarii	5.4	+1.47	+4.2	-11 58.9	15 51.6	- 3 18.0	+0.9968	0.5145	+0.2452	+78	+11
150 B. Aquarii	6.0	1.41	3.7	9 27.8	19 3.7	- 0 11.7	-0.8872	0.5124	0.2474	- 5	-90
167 G. Aquarii	6.3	1.28	4.3	8 20.3	7 6 10.5	+10 35.4	+0.6997	0.5060	0.2535	+82	- 7
67 Aquarii	6.4	1.25	4.2	7 24.4	8 44.4	-10 55.2	+0.3570	0.5048	0.2546	+63	-25
252 B. Aquarii	5.8	1.17	4.1	5 26.4	15 4.2	- 4 46.3	-0.1310	0.5019	0.2568	+36	-50
197 G. Aquarii	6.3	+1.15	+4.2	- 5 15.8	16 11.7	- 3 40.7	-0.0312	0.5015	+0.2571	+41	-45
263 B. Aquarii	6.1	1.13	4.3	5 10.0	18 27.6	- 1 28.7	+0.4490	0.5006	0.2576	+69	-20
293 B. Aquarii	5.5	1.05	4.6	3 57.5	8 2 1.3	+ 5 52.2	+1.1042	0.4980	0.2589	+86	+17
13 Piscium	6.4	0.96	4.5	1 33.2	10 55.9	- 9 28.1	+0.8197	0.4959	0.2592	+88	- 1
14 Piscium	5.9	0.95	4.6	- 1 42.9	12 7.4	- 8 18.6	+1.3040	0.4957	0.2592	+88	+35
λ Piscium	4.6	+0.88	+4.0	+ 1 18.8	16 27.6	- 4 5.6	-0.8553	0.4949	+0.2588	- 2	-89

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Lim ing P allels
Name.	Mag.	Red'ns from 1915.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.
		s	″	° ′	d h m	h m				°
τ Scorpii	2.9	+0.54	− 6.4	−28 2.5	8 2 31.9	+ 7 12.6	+1.0037	0.5918	−0.0779	+62
134 B. Scorpii	6.4	0.50	6.8	27 18.0	5 44.5	+10 17.3	+0.0159	0.5930	0.0680	+21
135 B. Scorpii	6.0	0.50	6.4	28 21.2	5 59.7	+10 31.9	+1.0685	0.5931	0.0672	+62
95 G. Ophiuchi	6.1	0.40	6.6	27 39.6	16 21.7	− 3 31.8	−0.1623	0.5957	0.0343	+ 9
43 Ophiuchi	5.4	0.36	6.5	28 3.8	20 28.3	+ 0 24.6	+0.1341	0.5962	−0.0210	+23
163 G. Ophiuchi	6.3	+0.29	− 6.6	−27 50.8	9 3 58.2	+ 7 35.8	−0.1530	0.5963	+0.0034	+ 7
X Sagittarii (*var.*)	4.4	0.28	6.6	27 48.1	5 34.6	+ 9 8.1	−0.1889	0.5962	0.0086	+ 5
4 G. Sagittarii	6.2	0.27	6.8	26 56.9	5 55.8	+ 9 28.4	−1.0538	0.5962	0.0097	−43
10 G. Sagittarii	5.7	0.25	6.5	28 3.2	9 0.8	−11 34.2	+0.1169	0.5958	0.0197	+22
210 B. Scorpii	5.8	0.24	6.4	28 45.1	9 44.5	−10 52.4	+0.8426	0.5957	0.0220	+61
38 B. Sagittarii	4.7	+0.21	− 6.4	−28 28.1	13 18.5	− 7 27.2	+0.6540	0.5950	+0.0335	+56
C. D.−28° 14268	6.4	0.20	6.3	28 55.3	14 46.3	− 6 3.1	+1.1682	0.5946	0.0382	+61
48 G. Sagittarii	6.3	0.18	6.5	28 19.1	16 50.2	− 4 4.2	+0.6390	0.5941	0.0447	+56
62 B. Sagittarii	6.0	0.18	6.3	28 41.0	16 50.3	− 4 4.1	+1.0107	0.5941	0.0447	+61
66 B. Sagittarii	4.7	0.18	6.8	27 4.6	17 6.6	− 3 48.5	−0.6145	0.5940	0.0456	−14
58 G. Sagittarii	6.1	+0.17	− 6.4	−28 28.3	18 35.4	− 2 23.3	+0.8783	0.5935	+0.0503	+62
68 G. Sagittarii	6.2	0.15	6.8	26 41.3	20 48.0	− 0 16.2	−0.8207	0.5927	0.0572	−24
69 G. Sagittarii	6.3	0.15	6.8	26 48.6	20 56.5	− 0 8.1	−0.6873	0.5927	0.0577	−17
86 B. Sagittarii	6.5	0.15	6.8	26 38.3	21 16.1	+ 0 10.7	−0.8439	0.5926	0.0587	−25
φ Sagittarii	3.3	0.10	6.6	27 4.9	10 3 40.1	+ 6 19.2	+0.0458	0.5898	0.0784	+23
σ Sagittarii	2.1	+0.08	− 6.8	−26 24.3	7 23.9	+ 9 53.9	−0.3311	0.5879	+0.0895	+ 5
201 B. Sagittarii	5.9	0.04	6.8	26 3.1	14 25.9	− 7 20.9	+0.0094	0.5838	0.1099	+24
ψ Sagittarii	4.9	0.03	6.9	25 24.4	15 21.2	− 6 27.8	−0.5496	0.5833	0.1125	− 4
χ Sagittarii	4.9	+0.01	7.0	24 40.6	19 13.6	− 2 44.5	−0.8410	0.5807	0.1232	−19
51 Sagittarii	5.8	0.00	6.8	24 54.5	23 32.1	+ 1 23.9	−0.0486	0.5776	0.1347	+24
h Sagittarii	4.7	−0.01	− 6.8	−25 4.4	23 48.2	+ 1 39.4	+0.1582	0.5774	+0.1354	+34
53 Sagittarii	6.3	0.02	7.0	23 37.4	11 1 5.2	+ 2 53.4	−1.1536	0.5765	0.1387	−40
274 B. Sagittarii	6.1	0.02	7.0	23 37.6	1 12.4	+ 3 0.3	−1.1348	0.5764	0.1390	−38
308 B. Sagittarii	6.3	0.04	6.8	24 9.3	6 59.4	+ 8 34.0	+0.2539	0.5719	0.1535	+41
329 B. Sagittarii	6.1	0.05	6.9	22 58.4	9 56.1	+11 24.1	−0.4989	0.5696	0.1605	+ 3
336 B. Sagittarii	6.5	−0.06	− 6.9	−22 50.2	10 54.7	−11 39.5	−0.4822	0.5688	+0.1628	+ 5
				NEW	*MOON.*					
13 Piscium	6.4	−0.09	− 1.5	− 1 33.3	15 14 42.1	−11 4.6	+0.5914	0.5014	+0.2665	+80
14 Piscium	5.9	0.09	1.5	− 1 43.0	15 52.1	− 9 56.6	+1.0761	0.5011	0.2663	+88
λ Piscium	4.6	−0.10	− 0.8	+ 1 18.7	20 7.2	− 5 48.7	−1.0449	0.5000	+0.2658	−13
21 Piscium	5.6	0.07	0.5	0 36.2	16 0 6.1	− 1 56.6	+0.7734	0.4991	0.2650	+90
22 Piscium	5.8	0.08	0.1	2 27.5	1 27.2	− 0 37.8	−0.8649	0.4988	0.2647	− 1
25 Piscium	6.2	−0.07	− 0.2	1 37.1	2 3.2	− 0 2.8	+0.1988	0.4987	0.2646	+55
51 Piscium	5.6	+0.02	+ 2.3	6 29.2	23 21.2	− 3 20.6	+0.4821	0.4968	0.2553	+72
136 B. Piscium	6.5	+0.03	+ 3.2	+ 8 53.5	17 4 7.5	+ 1 17.8	−0.9237	0.4970	+0.2522	− 5
η Piscium	3.7	0.20	6.5	14 54.6	18 7 5.3	+ 3 29.9	−1.0079	0.5015	0.2286	−12
101 Piscium	6.2	0.23	6.5	14 13.7	9 22.0	+ 5 42.6	+0.2579	0.5022	0.2261	+58
105 Piscium	6.1	0.24	7.1	15 58.6	11 24.7	+ 7 41.8	−1.2040	0.5028	0.2238	−27
4 Arietis	5.8	0.28	7.6	16 32.1	15 52.7	−11 58.0	−0.8311	0.5042	0.2185	0
ι Arietis	5.1	+0.32	+ 8.1	+17 24.3	20 39.7	− 7 19.3	−0.7595	0.5059	+0.2126	+ 3
35 B. Arietis	6.4	0.35	8.4	17 50.9	23 57.6	− 4 7.3	−0.5532	0.5072	0.2083	+14
47 B. Arietis	6.5	0.38	8.4	17 37.6	19 2 3.6	− 2 4.9	+0.1238	0.5080	0.2055	+51
20 H^1. Arietis	6.4	0.39	8.2	16 49.7	2 53.7	− 1 16.2	+1.1767	0.5083	0.2043	+90
15 Arietis	5.9	0.38	9.0	19 6.1	3 30.8	− 0 40.2	−1.2063	0.5086	0.2035	−29
θ Arietis	5.6	+0.43	+ 9.2	+19 30.7	7 21.8	+ 3 3.9	−0.8856	0.5102	+0.1981	− 5
26 Arietis	6.2	0.50	9.5	19 28.9	13 43.3	+ 9 14.0	+0.3767	0.5130	0.1886	+66
ν Arietis	5.4	0.54	10.4	21 35.8	17 49.2	−10 47.6	−1.2029	0.5149	0.1822	−31
μ Arietis	5.7	0.58	9.8	19 39.2	19 37.1	− 9 3.0	+1.2729	0.5158	0.1793	+85
ε Arietis (*mean*)	4.6	0.68	10.5	21 0.2	20 3 57.6	− 0 57.9	+1.2166	0.5198	0.1653	+90
64 Arietis	5.8	+0.84	+11.8	+24 25.6	16 6.6	+10 48.1	−0.6974	0.5260	+0.1430	+ 5

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.		Hour Angle, H	Y	x′	y′	N.	S.
		Δα	Δδ									
		s	″	° ′	d	h m	h m				°	°
Tauri	5.9	+0.92	+11.8	+24 11.0	20	20 57.5	− 8 30.3	+0.2426	0.5286	+0.1335	+58	−15
Tauri	6.1	0.96	12.1	25 3.5		23 56.8	− 5 36.8	−0.3364	0.5301	0.1274	+25	−44
Tauri	5.4	0.99	11.7	24 1.6	21	1 51.9	− 3 45.5	+1.0468	0.5311	0.1235	+90	+32
Tauri	3.8	0.99	11.6	23 51.0		1 54.1	− 3 43.3	+1.2460	0.5311	0.1234	+83	+50
Tauri	5.6	0.99	11.9	24 34.6		2 1.5	− 3 36.2	+0.4573	0.5312	0.1231	+74	− 3
Tauri	4.3	+0.99	+11.8	+24 12.3		2 3.1	− 3 34.7	+0.8721	0.5312	+0.1231	+90	+20
Tauri	4.1	0.99	11.7	24 6.4		2 20.7	− 3 17.6	+1.0173	0.5314	0.1225	+90	+29
Tauri	5.8	1.00	11.8	24 17.6		2 22.8	− 3 15.6	+0.8146	0.5314	0.1224	+90	+17
Tauri	6.5	1.00	11.8	24 16.0		2 26.8	− 3 11.7	+0.8520	0.5314	0.1223	+90	+19
H. Tauri	5.3	1.03	12.2	25 19.6		4 26.0	− 1 16.4	−0.0822	0.5325	0.1182	+39	−30
Tauri	5.6	+1.18	+12.3	+26 15.8		13 57.2	+ 7 55.9	−0.0895	0.5372	+0.0975	+39	−28
Tauri	5.0	1.25	12.5	27 9.1		18 18.5	−11 51.5	−0.6671	0.5393	0.0877	+ 6	−60
B. Aurigæ	6.0	1.50	12.1	27 45.6	22	8 56.8	+ 2 16.9	−0.3022	0.5456	0.0531	+27	−36
B. Aurigæ	6.5	1.58	11.7	27 34.9		14 13.6	+ 7 22.7	+0.1401	0.5476	0.0401	+52	−11
B. Aurigæ	6.0	1.62	11.6	27 55.6		16 29.2	+ 9 33.6	−0.1559	0.5484	0.0345	+35	−25
B. Tauri	6.4	+1.70	+11.2	+27 52.5		21 27.1	− 9 39.0	+0.0415	0.5500	+0.0219	+46	−14
Aurigæ	6.4	1.73	11.5	28 51.6		22 29.2	− 8 39.0	−1.0170	0.5503	0.0193	−19	−61
Tauri	1.8	1.75	11.2	28 32.4		23 46.3	− 7 24.6	−0.6430	0.5507	0.0160	+ 7	−55
B. Aurigæ	6.5	1.80	10.6	27 36.6	23	4 0.9	− 3 19.0	+0.4198	0.5518	0.0051	+71	+ 7
B. Aurigæ	5.7	1.80	10.3	26 52.5		4 33.7	− 2 47.4	+1.2273	0.5519	+0.0037	+80	+58
B. Tauri	5.6	+1.91	+10.0	+27 56.8		10 34.6	+ 3 0.7	+0.0301	0.5532	−0.0119	+46	−14
Tauri	4.6	1.92	9.9	27 35.8		11 36.7	+ 4 0.6	+0.3989	0.5534	0.0146	+70	+ 5
B. Aurigæ	6.4	1.96	10.1	28 56.0		12 59.7	+ 5 20.6	−1.0824	0.5537	0.0182	−25	−61
B. Tauri	6.1	1.97	9.5	27 34.3		14 57.3	+ 7 14.1	+0.3616	0.5540	0.0233	+67	+ 2
Aurigæ	5.1	2.20	7.9	28 5.5	24	5 47.2	− 2 27.7	−0.8356	0.5551	0.0620	− 5	−62
Aurigæ	5.8	+2.23	+ 7.7	+28 20.5		7 40.2	− 0 38.7	−1.2263	0.5551	−0.0669	−42	−62
Geminorum	6.2	2.29	5.9	26 11.7		16 4.3	+ 7 27.3	+0.4403	0.5547	0.0885	+72	0
Geminorum	6.3	2.30	5.8	26 1.9		16 21.7	+ 7 44.1	+0.5905	0.5547	0.0892	+86	+ 8
Geminorum	5.6	2.38	5.4	26 59.9		21 32.2	−11 16.5	−0.9452	0.5541	0.1023	−12	−63
Geminorum	6.1	2.36	4.6	25 2.1		23 0.8	− 9 50.9	+1.0116	0.5539	0.1060	+90	+32
B. Geminorum	6.5	+2.41	+ 4.9	+26 50.7	25	0 0.7	− 8 53.2	−1.0397	0.5538	−0.1084	−19	−63
Geminorum	5.1	2.40	4.0	25 13.0		2 51.0	− 6 8.9	+0.3910	0.5534	0.1155	+69	− 5
B. Geminorum	6.3	2.45	2.9	24 33.1		9 20.1	+ 0 6.4	+0.3006	0.5522	0.1312	+62	−11
B. Geminorum	6.0	2.46	2.8	24 25.0		9 45.5	+ 0 30.9	+0.3894	0.5521	0.1322	+68	− 7
Geminorum	3.7	2.48	2.5	24 36.2		12 4.1	+ 2 44.6	−0.1218	0.5516	0.1376	+37	−33
Geminorum	6.3	+2.47	+ 1.9	+23 21.2		13 54.1	+ 4 30.8	+0.9555	0.5512	−0.1419	+90	+24
5 B. Geminorum	6.4	2.53	1.1	23 49.1		19 24.6	+ 9 49.7	−0.3571	0.5498	0.1545	+24	−48
9 Cancri	6.2	2.53	0.6	22 52.7		21 46.6	−11 53.2	+0.2681	0.5492	0.1598	+60	−16
Cancri	5.5	2.51	0.2	21 49.8		22 26.4	−11 14.8	+1.2755	0.5491	0.1613	+81	+50
5 B. Cancri	6.4	2.57	+ 0.1	23 23.7	26	1 4.0	− 8 42.6	−0.8155	0.5483	0.1670	− 2	−67
9 B. Cancri	6.0	+2.54	− 0.8	+21 1.0		4 4.4	− 5 48.4	+1.1895	0.5474	−0.1735	+90	+38
η Cancri	5.5	2.57	1.8	20 43.8		9 38.5	− 0 25.8	+0.4909	0.5458	0.1850	+76	− 7
9 Cancri	6.5	2.58	2.4	20 18.5		12 59.5	+ 2 48.2	+0.3037	0.5447	0.1917	+62	−17
0 Cancri	6.5	2.58	2.4	20 16.3		13 1.8	+ 2 50.5	+0.3345	0.5447	0.1918	+64	−16
2 B. Cancri	6.5	2.58	2.5	19 58.2		13 6.8	+ 2 55.3	+0.6354	0.5447	0.1920	+88	0
ε Cancri	6.3	+2.58	− 2.5	+19 50.7		13 9.2	+ 2 57.7	+0.7594	0.5447	−0.1921	+90	+ 6
B. Cancri	6.1	2.59	3.4	19 9.0		17 50.5	+ 7 29.3	+0.5676	0.5432	0.2011	+81	− 5
B. Cancri	6.4	2.58	6.0	15 43.9	27	7 54.0	− 2 55.5	+1.1314	0.5390	0.2256	+90	+26
B. Leonis	6.3	2.61	6.2	16 57.1		9 52.7	− 1 0.8	−0.5887	0.5384	0.2287	+13	−70
7 Leonis	6.2	2.58	7.1	14 45.5		14 42.7	+ 3 39.6	+0.5675	0.5370	0.2360	+80	− 9
Leonis	6.5	+2.58	− 7.3	+14 43.8		15 42.8	+ 4 37.8	+0.3589	0.5368	−0.2375	+65	−20
φ Leonis	5.6	2.58	7.7	14 24.5		18 23.1	+ 7 12.8	+0.0518	0.5360	0.2413	+46	−36
ν Leonis	5.0	2.57	8.8	12 50.9	28	1 12.7	−10 11.1	−0.0127	0.5344	0.2502	+43	−40
A Leonis	4.6	2.53	9.6	10 24.7		5 48.5	− 5 44.2	+1.3348	0.5334	0.2556	+84	+42
α Leonis	1.3	2.56	9.5	12 22.8		6 1.3	− 5 31.9	−0.7470	0.5334	0.2559	+ 5	−78
44 Leonis	5.9	+2.52	−10.7	+ 9 12.9		14 2.9	+ 2 14.1	+0.4198	0.5320	−0.2642	+68	−20

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
45 Leonis	5.8	+2.54	−10.8	+10 11.6	28 15 10.9	+ 3 19.9	−0.8842	0.5318	−0.2652	− 3	−80
ρ Leonis	3.8	2.53	11.1	9 44.5	17 38.7	+ 5 42.9	−1.0761	0.5314	0.2674	−15	−80
48 Leonis	5.2	2.49	11.3	7 23.3	18 36.7	+ 6 39.1	+1.0742	0.5314	0.2682	+90	+16
49 Leonis	5.7	+2.52	−11.3	+ 9 5.2	18 42.8	+ 6 45.0	−0.6913	0.5313	−0.2683	+ 8	−81

MARCH.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
37 Sextantis	6.3	+2.49	−11.9	+ 6 49.1	1 0 0.2	+11 52.2	+0.1984	0.5308	−0.2724	+55	−3
56 Leonis	6.1	2.48	12.5	6 38.2	4 45.1	− 7 32.1	−0.9161	0.5305	0.2754	− 5	−83
d Leonis	5.0	2.44	12.7	4 4.2	6 55.9	− 5 25.5	+1.0960	0.5304	0.2767	−90	−1
75 Leonis	5.4	+2.41	−13.5	+ 2 28.5	14 56.1	+ 2 19.3	+0.4869	0.5305	−0.2802	+73	−19
76 Leonis	6.0	2.41	13.6	2 6.8	15 43.1	+ 3 4.8	+0.6344	0.5306	0.2805	+84	−11
79 Leonis	5.5	2.40	13.8	+ 1 52.2	18 9.9	+ 5 26.9	+0.1926	0.5307	0.2812	+54	−34
υ Leonis	4.5	2.37	14.2	− 0 21.5	2 0 19.5	+11 24.6	+0.7139	0.5314	0.2823	+90	− 7
9 B. Virginis	6.2	2.36	14.6	+ 0 9.0	6 4.4	− 7 1.7	−1.4228	0.5323	0.2825	−52	−7
78 B. Virginis	6.5	+2.27	−14.9	− 5 15.0	17 58.5	+ 4 29.2	+0.6753	0.5351	−0.2801	+84	−
χ Virginis	4.8	2.21	15.2	7 31.9	3 5 35.8	− 8 16.6	−0.2537	0.5392	0.2742	+29	−5
ψ Virginis	5.0	2.18	15.2	9 4.9	12 31.2	− 1 35.1	−0.5770	0.5421	0.2689	+12	−80
49 Virginis	5.2	2.14	15.2	10 17.4	18 39.4	+ 4 20.6	−0.9957	0.5451	0.2631	−12	−90
i Virginis	5.7	2.09	15.0	12 16.2	4 3 4.1	−11 32.2	−1.1828	0.5495	0.2535	−28	−90
75 Virginis	5.6	+2.07	−14.4	−14 55.8	5 45.9	− 8 56.1	+0.8080	0.5511	−0.2500	+75	− 1
83 Virginis	5.6	2.04	14.3	15 45.4	10 51.2	− 4 1.4	+0.3829	0.5541	0.2427	+59	−24
85 Virginis	6.1	2.04	14.4	15 20.7	11 20.0	− 3 33.6	−0.1457	0.5543	0.2420	+30	−52
43 H. Virginis	5.5	1.95	13.8	17 48.5	5 0 6.0	+ 8 44.7	−0.6310	0.5623	0.2205	+ 3	−87
231 G. Virginis	6.4	1.95	13.6	18 11.7	0 47.7	+ 9 24.8	−0.3965	0.5627	0.2192	+15	−88
236 G. Virginis	5.7	+1.94	−13.6	−18 19.6	1 27.6	+10 3.2	−0.4096	0.5632	−0.2179	+14	−90
9 G. Libræ	6.5	1.90	13.0	20 4.2	8 12.7	− 7 26.7	−0.0851	0.5675	0.2045	+29	−40
17 G. Libræ	6.4	1.86	12.8	20 49.2	12 52.8	− 2 57.1	−0.2634	0.5705	0.1944	+10	−50
18 G. Libræ	6.1	1.86	12.7	20 58.3	13 18.2	− 2 32.6	−0.1923	0.5708	0.1935	+22	−55
43 B. Libræ	5.7	1.84	12.8	21 2.2	17 26.0	+ 1 25.8	−0.9076	0.5734	0.1841	−17	−90
47 G. Libræ	6.1	+1.80	−12.2	−21 42.3	21 5.9	+ 4 57.2	−0.8944	0.5757	−0.1753	−17	−90
64 G. Libræ	5.8	1.77	12.0	22 5.3	6 1 4.6	+ 8 46.7	−1.1871	0.5780	0.1654	−40	−90
153 B. Libræ	6.3	1.72	11.1	24 12.3	7 41.9	− 8 51.5	−0.0955	0.5818	0.1482	+22	−40
42 Libræ	5.0	1.69	11.2	23 32.7	10 30.5	− 6 9.7	−1.1658	0.5833	0.1406	−41	−90
b Scorpii	4.7	1.66	10.3	25 29.8	14 39.5	− 2 10.6	+0.2424	0.5853	0.1290	+30	−50
A Scorpii	4.6	+1.65	−10.4	−25 4.6	15 41.3	− 1 11.2	−0.3126	0.5858	−0.1261	+ 9	−63
31 B. Scorpii	5.4	1.64	10.7	24 17.0	15 48.5	− 1 4.3	−1.1287	0.5859	0.1258	−30	−90
3 Scorpii	5.9	1.65	10.4	24 59.7	16 5.7	− 0 47.9	−0.4460	0.5860	0.1250	+ 2	−73
4 Scorpii	5.7	1.65	10.0	26 1.1	16 24.6	− 0 29.7	+0.5482	0.5862	0.1240	+55	−1
40 B. Scorpii	5.4	1.63	10.5	24 35.4	17 37.2	+ 0 40.0	−1.0432	0.5867	0.1206	−33	−90
π Scorpii	3.0	+1.64	−10.1	−25 52.4	17 42.5	+ 0 45.1	+0.2423	0.5867	−0.1203	+38	−50
48 B. Scorpii	4.9	1.62	10.1	25 37.9	19 27.1	+ 2 25.5	−0.2066	0.5875	0.1153	+14	−50
65 B. Scorpii	5.5	1.60	9.8	26 6.1	21 17.0	+ 4 10.9	+0.0623	0.5882	0.1099	+27	−80
85 B. Scorpii	6.0	1.57	10.0	25 15.9	23 54.0	+ 6 41.5	−1.0621	0.5892	0.1021	−30	−80
σ Scorpii	3.1	1.55	9.8	25 23.6	7 2 18.7	+ 9 0.4	−1.1711	0.5900	0.0949	−46	−90
α Scorpii	1.2	+1.52	− 9.3	−26 14.8	5 26.5	−11 59.5	−0.5889	0.5910	−0.0853	− 9	−80
116 B. Scorpii	6.2	1.51	9.3	26 21.4	6 11.6	−11 16.3	−0.5418	0.5912	0.0830	− 7	−81
τ Scorpii	2.9	1.51	8.6	28 2.6	7 53.0	− 9 39.0	+1.0315	0.5917	0.0778	+62	−20
134 B. Scorpii	6.4	1.47	8.6	27 18.0	11 5.5	− 6 34.4	+0.0448	0.5924	0.0678	+22	−41
135 B. Scorpii	6.0	1.47	8.2	28 21.3	11 20.8	− 6 19.7	+1.0971	0.5924	0.0670	+62	−20
95 G. Ophiuchi	6.1	+1.36	− 7.9	−27 39.6	21 44.7	+ 3 38.5	−0.1329	0.5936	−0.0341	+11	−5
43 Ophiuchi	5.4	1.31	7.5	28 3.8	8 1 52.8	+ 7 36.4	+0.1642	0.5935	−0.0209	+25	−
163 G. Ophiuchi	6.3	1.23	7.1	27 50.8	9 26.5	− 9 8.6	−0.1234	0.5927	+0.0034	+ 8	−
X Sagittarii (*var.*)	4.4	1.21	7.0	27 48.1	11 3.9	− 7 35.2	−0.1594	0.5924	0.0085	+ 7	−5
4 G. Sagittarii	6.2	1.20	7.3	26 56.9	11 25.3	− 7 14.7	−1.0275	0.5923	0.0097	−42	−90
10 G. Sagittarii	5.7	+1.17	− 6.7	−28 3.2	14 32.3	− 4 15.3	+0.1475	0.5916	+0.0196	+23	−35

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
B. Scorpii	5.8	+1.17	− 6.4	−28 45.1	8 15 16.5	− 3 33.0	+0.8762	0.5914	+0.0219	+61	+ 8
B. Sagittarii	4.7	1.13	6.2	28 28.1	18 53.1	− 0 5.2	+0.6871	0.5903	0.0332	+59	− 4
C. D.−28° 14268	6.4	1.11	6.0	28 55.3	20 22.1	+ 1 20.1	+1.2039	0.5898	0.0379	+61	+39
G. Sagittarii	6.3	1.09	6.1	28 19.1	22 27.7	+ 3 20.7	+0.6724	0.5890	0.0443	+58	− 5
B. Sagittarii	6.0	1.09	5.9	28 41.0	22 27.9	+ 3 20.9	+1.0459	0.5890	0.0443	+61	+21
B. Sagittarii	4.7	+1.07	− 6.5	−27 4.6	22 44.4	+ 3 36.6	−0.5877	0.5889	+0.0452	−12	−86
G. Sagittarii	6.1	1.07	5.9	28 28.3	9 0 14.4	+ 5 3.1	+0.9130	0.5883	0.0498	+62	+11
G. Sagittarii	6.2	1.03	6.4	26 41.3	2 29.1	+ 7 12.3	−0.7954	0.5874	0.0567	−23	−90
G. Sagittarii	6.3	1.03	6.3	26 48.6	2 37.7	+ 7 20.5	−0.6613	0.5873	0.0571	−16	−90
B. Sagittarii	6.5	1.02	6.4	26 38.3	2 57.5	+ 7 39.5	−0.8188	0.5871	0.0581	−24	−90
Sagittarii	3.3	+0.96	− 5.8	−27 4.8	9 27.8	−10 5.8	+0.0756	0.5839	+0.0775	+25	−39
Sagittarii	2.1	0.91	5.7	26 24.3	13 15.6	− 6 27.0	−0.3042	0.5817	0.0885	+ 6	−63
B. Sagittarii	5.9	0.84	5.4	26 3.1	20 25.5	+ 0 26.1	+0.0380	0.5772	0.1085	+26	−42
Sagittarii	4.9	0.82	5.5	25 24.3	21 21.8	+ 1 20.2	−0.5254	0.5766	0.1110	− 3	−80
Sagittarii	4.9	0.78	5.5	24 40.6	10 1 18.8	+ 5 8.1	−0.8198	0.5738	0.1216	−18	−90
Sagittarii	5.8	+0.74	− 5.1	−24 54.4	5 42.7	+ 9 21.9	−0.0218	0.5706	+0.1328	+25	−45
h Sagittarii	4.7	0.74	5.1	25 4.4	5 59.2	+ 9 37.9	+0.1867	0.5704	0.1335	+36	−33
3 Sagittarii	6.3	0.71	5.4	23 37.4	7 17.8	+10 53.5	−1.1366	0.5694	0.1368	−38	−90
4 B. Sagittarii	6.1	0.71	5.4	23 37.6	7 25.1	+11 0.5	−1.1175	0.5693	0.1371	−36	−90
8 B. Sagittarii	6.3	0.66	4.9	24 9.3	13 19.6	− 7 18.2	+0.2820	0.5648	0.1513	+43	−28
9 B. Sagittarii	6.1	+0.62	− 5.0	−22 58.4	16 20.1	− 4 24.4	−0.4781	0.5624	+0.1583	+ 5	−75
6 B. Sagittarii	6.5	0.61	5.0	22 50.2	17 20.0	− 3 26.7	−0.4616	0.5616	0.1605	+ 6	−73
4 Capricorni	5.7	0.56	4.8	22 4.5	23 28.3	+ 2 28.4	−0.2273	0.5567	0.1738	+19	−57
6 B. Capricorni	6.2	0.52	4.3	22 40.5	11 4 28.9	+ 7 18.2	+1.2956	0.5526	0.1839	+67	+44
9 Capricorni	5.7	0.40	4.7	18 14.8	15 50.9	− 5 43.4	−1.1181	0.5435	0.2045	−29	−90
σ Capricorni	6.2	+0.40	− 4.3	−19 22.0	18 1.5	− 3 37.2	+0.5028	0.5418	+0.2081	+62	−17
11 Capricorni	6.5	0.38	4.6	17 51.8	18 37.4	− 3 2.5	−0.9461	0.5413	0.2090	−16	−90
θ Capricorni	4.2	0.37	4.5	17 34.4	20 57.8	− 0 46.9	−0.7590	0.5395	0.2127	− 4	−90
URANUS	6.0	. . .	. . .	17 18.1	23 7.0	+ 1 18.0	−0.5828	0.5358	0.2154	+ 6	−82
14 B. Capricorni	6.1	0.34	4.2	17 41.9	12 1 13.5	+ 3 20.3	+0.2929	0.5362	0.2190	+52	−28
30 Capricorni	5.4	+0.34	− 3.9	−18 20.6	2 33.1	+ 4 37.3	+1.2622	0.5352	+0.2209	+72	+35
31 Capricorni	6.3	0.34	4.0	17 49.2	2 42.0	+ 4 45.9	+0.7463	0.5351	0.2211	+72	− 3
ι Capricorni	4.3	0.32	4.1	17 11.9	4 35.1	+ 6 35.4	+0.5123	0.5336	0.2237	+65	−17
42 Capricorni	5.1	0.24	4.0	14 25.7	13 51.5	− 8 26.1	−0.2736	0.5270	0.2353	+25	−59
44 Capricorni	6.0	0.24	3.9	14 47.4	14 35.4	− 7 43.6	+0.2802	0.5265	0.2361	+54	−29
45 Capricorni	5.8	+0.25	− 3.8	−15 8.4	15 2.7	− 7 17.2	+0.7579	0.5262	+0.2366	+75	− 4
51 B. Capricorni	6.1	0.22	3.9	13 7.2	17 49.8	− 4 35.4	−0.7112	0.5244	0.2396	+ 2	−90
μ Capricorni	5.2	0.22	− 3.7	13 57.2	19 34.8	− 2 53.7	+0.5897	0.5232	0.2414	+73	−13
MERCURY	0.7	. . .	. . .	−12 53.8	20 35.9	− 1 54.4	−0.2820	0.4962	0.2427	+26	−60
				NEW	*MOON.*						
η Piscium	3.7	0.00	+ 4.7	+14 54.6	17 15 6.0	−10 41.6	−1.0811	0.5042	+0.2291	−17	−75
01 Piscium	6.2	+0.02	4.8	14 13.7	17 22.1	− 8 29.4	+0.1837	0.5049	0.2266	+54	−30
05 Piscium	6.1	0.02	5.2	15 58.6	19 24.2	− 6 30.9	−1.2798	0.5055	0.2243	−35	−74
4 Arietis	5.8	0.04	5.6	16 32.1	23 50.9	− 2 12.0	−0.9095	0.5070	0.2191	− 6	−73
ι Arietis	5.1	+0.06	+ 6.1	+17 24.3	18 4 36.5	+ 2 25.3	−0.8409	0.5087	+0.2131	− 2	−73
35 B. Arietis	6.4	0.08	6.4	17 50.8	7 53.5	+ 5 36.5	−0.6365	0.5099	0.2088	+10	−71
47 B. Arietis	6.5	0.10	6.4	17 37.6	9 58.8	+ 7 38.0	+0.0394	0.5107	0.2059	+46	−34
20 H¹. Arietis	6.4	0.11	6.3	16 49.7	10 48.7	+ 8 26.5	+1.0920	0.5110	0.2048	+90	+24
15 Arietis	5.9	0.10	6.8	19 6.1	11 25.7	+ 9 2.4	−1.2919	0.5112	0.2039	−39	−71
θ Arietis	5.6	+0.13	+ 7.2	+19 30.6	15 15.5	−11 14.7	−0.9733	0.5128	+0.1985	−11	−70
26 Arietis	6.2	0.18	7.6	19 28.8	21 35.5	− 5 6.2	+0.2860	0.5154	0.1889	+60	−19
γ Arietis	5.4	0.20	8.4	21 35.8	19 1 40.5	− 1 8.6	−1.2965	0.5172	0.1825	−43	−68
μ Arietis	5.7	0.24	8.0	19 39.1	3 28.1	+ 0 35.7	+1.1798	0.5180	0.1795	+90	+36
ε Arietis (*mean*)	4.6	0.31	8.7	21 0.2	11 47.3	+ 8 39.4	+1.1200	0.5217	0.1653	+90	+32
64 Arietis	5.8	+0 43	+10.1	+24 25.6	23 55.5	− 3 35.3	−0.8012	0.5272	+0.1428	− 2	−66

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.		Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d	h m	h m				°	°
7 Tauri	5.9	+0.49	+10.1	+24 11.0	20	4 46.5	+ 1 6.5	+0.1385	0.5295	+0.1333	+52	−22
11 Tauri	6.1	0.52	10.5	25 3.5		7 46.0	+ 4 0.2	−0.4427	0.5308	0.1272	+19	−5
16 Tauri	5.4	0.55	10.2	24 1.5		9 41.3	+ 5 51.7	+0.9429	0.5316	0.1232	+90	+25
17 Tauri	3.8	0.55	10.1	23 51.0		9 43.5	+ 5 53.9	+1.1425	0.5317	0.1231	+90	+40
18 Tauri	5.6	0.55	10.4	24 34.6		9 50.9	+ 6 1.0	+0.3521	0.5317	0.1229	+66	− 8
q Tauri	4.3	+0.56	+10.2	+24 12.3		9 52.5	+ 6 2.5	+0.7678	0.5317	+0.1228	+90	+14
20 Tauri	4.1	0.56	10.2	24 6.3		10 10.2	+ 6 19.7	+0.9131	0.5318	0.1222	+90	+23
21 Tauri	5.8	0.56	10.3	24 17.6		10 12.3	+ 6 21.8	+0.7100	0.5319	0.1221	+90	+10
22 Tauri	6.5	0.56	10.3	24 16.0		10 16.3	+ 6 25.6	+0.7475	0.5319	0.1220	+90	+13
η Tauri	3.0	0.57	10.2	23 50.8		10 57.3	+ 7 5.3	+1.2966	0.5322	0.1206	+70	+59
14 H. Tauri	5.3	+0.58	+10.6	+25 19.6		12 15.8	+ 8 21.2	−0.1895	0.5328	+0.1178	+33	−35
p Tauri	5.6	0.72	11.0	26 15.8		21 49.0	− 6 24.5	−0.1996	0.5368	0.0971	+32	−34
φ Tauri	5.0	0.78	11.3	27 9.1	21	2 11.6	− 2 10.6	−0.7801	0.5385	0.0873	− 1	−63
χ Tauri	5.3	0.80	10.8	25 26.0		3 14.7	− 1 9.7	+1.2144	0.5389	0.0849	+85	+50
17 B. Aurigæ	6.0	1.01	11.3	27 45.6		16 56.4	−11 55.8	−0.4174	0.5436	0.0527	+20	−42
38 B. Aurigæ	6.5	+1.09	+11.0	+27 34.9		22 16.3	− 6 46.8	+0.0261	0.5451	+0.0397	+45	−15
47 B. Aurigæ	6.0	1.13	11.1	27 55.6	22	0 33.4	− 4 34.4	−0.2716	0.5457	0.0341	+28	−32
354 B. Tauri	6.4	1.20	10.9	27 52.5		5 34.8	+ 0 16.5	−0.0737	0.5468	0.0217	+30	−20
22 Aurigæ	6.4	1.23	11.2	28 51.6		6 37.6	+ 1 17.2	−1.1380	0.5470	0.0190	−31	−61
β Tauri	1.8	1.25	11.0	28 32.4		7 55.7	+ 2 32.6	−0.7622	0.5473	0.0158	− 1	−61
107 B. Aurigæ	6.5	+1.31	+10.4	+27 36.6		12 13.7	+ 6 41.6	+0.3063	0.5480	+0.0050	+63	+ 1
112 B. Aurigæ	5.7	1.31	10.1	26 52.5		12 46.9	+ 7 13.6	+1.1185	0.5481	+0.0036	+90	+40
406 B. Tauri	5.6	1.42	10.1	27 56.8		18 53.0	−10 53.0	−0.0859	0.5490	−0.0118	+39	−21
136 Tauri	4.6	1.43	9.9	27 35.8		19 56.0	− 9 52.2	+0.2853	0.5491	0.0145	+62	− 1
154 B. Aurigæ	6.4	1.47	10.3	28 56.0		21 20.3	− 8 30.9	−1.2054	0.5492	0.0181	−40	−61
415 B. Tauri	6.1	+1.49	+ 9.7	+27 34.3		23 19.8	− 6 35.6	+0.2478	0.5494	−0.0231	+59	− 4
49 Aurigæ	5.1	1.73	8.5	28 5.5	23	14 24.9	+ 7 57.8	−0.9566	0.5496	0.0613	−14	−62
37 Geminorum	5.7	1.83	6.6	25 29.1		23 21.4	− 7 24.5	+1.2338	0.5489	0.0835	+82	+53
39 Geminorum	6.2	1.86	6.7	26 11.7	24	0 53.5	− 5 55.6	+0.3301	0.5487	0.0873	+64	− 5
40 Geminorum	6.3	1.86	6.6	26 1.9		1 11.2	− 5 38.4	+0.4814	0.5487	0.0880	+76	+ 2
47 Geminorum	5.6	+1.96	+ 6.3	+26 59.9		6 27.8	− 0 32.8	−1.0645	0.5480	−0.1009	−22	−63
52 Geminorum	6.1	1.95	5.5	25 2.1		7 58.1	+ 0 54.3	+0.9072	0.5478	0.1045	+90	+25
134 B. Geminorum	6.5	1.99	6.0	26 50.7		8 59.2	+ 1 53.3	−1.1591	0.5477	0.1069	−31	−63
A Geminorum	5.1	2.00	5.1	25 13.0		11 52.9	+ 4 41.0	+0.2830	0.5471	0.1138	+61	−10
176 B. Geminorum	6.3	2.08	4.0	24 33.1		18 29.7	+11 4.0	+0.1939	0.5458	0.1293	+55	−17
181 B. Geminorum	6.0	+2.08	+ 3.9	+24 25.0		18 55.7	+11 29.1	+0.2836	0.5457	−0.1303	+61	−12
κ Geminorum	3.7	2.12	3.7	24 36.2		21 17.0	−10 14.5	−0.2304	0.5453	0.1356	+31	−30
82 Geminorum	6.3	2.12	3.0	23 21.2		23 9.2	− 8 26.1	+0.8554	0.5448	0.1399	+90	+15
5 B. Cancri	6.4	2.20	2.4	23 49.1	25	4 46.2	− 3 0.7	−0.4644	0.5435	0.1523	+18	−54
9 Cancri	6.2	2.21	1.8	22 52.8		7 10.8	− 0 41.0	+0.1663	0.5430	0.1575	+53	−21
μ Cancri	5.5	+2.19	+ 1.3	+21 49.8		7 51.4	− 0 1.8	+1.1810	0.5428	−0.1589	+90	+30
35 B. Cancri	6.4	2.26	1.5	23 23.7		10 32.0	+ 2 33.2	−0.9232	0.5421	0.1646	− 9	−67
49 B. Cancri	6.0	2.24	+ 0.2	21 1.0		13 35.9	+ 5 31.0	+1.0970	0.5413	0.1710	+90	+31
η Cancri	5.5	2.30	− 0.6	20 43.8		19 16.0	+10 59.7	+0.3968	0.5399	0.1824	+68	−12
39 Cancri	6.5	2.32	1.3	20 18.5		22 40.5	− 9 42.8	+0.2105	0.5390	0.1890	+56	−22
40 Cancri	6.5	+2.32	− 1.3	+20 16.3		22 42.9	− 9 40.4	+0.2415	0.5390	−0.1891	+58	−20
102 B. Cancri	6.5	2.32	1.4	19 58.3		22 48.0	− 9 35.5	+0.5443	0.5390	0.1893	+70	− 5
ε Cancri	6.3	2.32	1.4	19 50.7		22 50.4	− 9 33.1	+0.6690	0.5390	0.1894	+90	+ 1
139 B. Cancri	6.1	2.35	2.3	19 9.0	26	3 36.5	− 4 56.7	+0.4790	0.5378	0.1983	+74	−10
227 B. Cancri	6.4	2.41	5.3	15 43.7		17 52.4	+ 8 50.9	+1.0557	0.5346	0.2228	+90	+21
12 B. Leonis	6.3	+2.45	− 5.2	+16 57.1		19 52.6	+10 47.2	−0.6698	0.5342	−0.2260	+ 8	−75
7 Leonis	6.2	2.45	6.5	14 45.5	27	0 46.0	− 8 29.0	+0.4952	0.5322	0.2334	+74	−13
11 Leonis	6.5	2.45	6.6	14 43.8		1 46.7	− 7 30.2	+0.2868	0.5330	0.2348	+60	−24
ψ Leonis	5.6	2.47	7.1	14 24.5		4 28.7	− 4 53.5	−0.0187	0.5326	0.2387	+43	−39
ν Leonis	5.0	2.49	8.4	12 50.9		11 21.8	+ 1 46.2	−0.0762	0.5317	0.2478	+40	−44
A Leonis	4.6	+2.47	− 9.5	+10 24.7		15 59.4	+ 6 14.8	+1.2783	0.5312	−0.2534	+90	+3

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.		Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ									
		s	″	° ′	d	h m	h m				°	°
α Leonis	1.3	+2.51	− 9.1	+12 22.8	27	16 12.3	+ 6 27.3	−0.8060	0.5312	−0.2536	+ 1	−78
4 Leonis	5.9	2.50	10.8	9 12.9	28	0 15.8	− 9 44.9	+0.3712	0.5307	0.2623	+65	−23
5 Leonis	5.8	2.53	10.7	10 11.6		1 24.0	− 8 38.9	−0.9312	0.5306	0.2634	− 6	−80
ρ Leonis	3.8	2.53	11.1	9 44.5		3 52.0	− 6 15.7	−1.1194	0.5306	0.2657	−19	−80
8 Leonis	5.2	2.50	11.7	7 23.3		4 50.1	− 5 19.4	+1.0306	0.5306	0.2666	+90	+13
9 Leonis	5.7	+2.52	−11.4	+ 9 5.2		4 56.1	− 5 13.6	−0.7335	0.5307	−0.2667	+ 6	−80
7 Sextantis	6.3	2.52	12.4	6 49.1		10 13.4	− 0 6.5	+0.1623	0.5307	0.2710	+52	−34
6 Leonis	6.1	2.54	13.0	6 38.1		14 57.6	+ 4 28.5	−0.9433	0.5311	0.2744	− 6	−83
d Leonis	5.0	2.51	13.6	4 4.2		17 7.9	+ 6 34.6	+1.0664	0.5313	0.2757	+90	+14
75 Leonis	5.4	2.52	14.6	2 28.4	29	1 5.1	− 9 43.6	+0.4697	0.5325	0.2798	+72	−19
76 Leonis	6.0	+2.52	−14.7	+ 2 6.8		1 51.7	− 8 58.5	+0.6176	0.5326	−0.2801	+83	−12
79 Leonis	5.5	2.53	15.0	+ 1 52.2		4 17.2	− 6 37.7	+0.1812	0.5331	0.2810	+54	−34
υ Leonis	4.5	2.52	15.7	− 0 21.5		10 23.0	− 0 43.8	+0.7081	0.5345	0.2825	+88	− 7
9 B. Virginis	6.2	2.54	16.1	+ 0 9.0		16 3.4	+ 4 45.4	−1.4060	0.5362	0.2831	−48	−76
78 B. Virginis	6.5	2.53	17.2	− 5 15.1	30	3 45.7	− 7 55.6	+0.6939	0.5406	0.2815	+85	− 8
χ Virginis	4.8	+2.54	−17.9	− 7 32.0		15 8.4	+ 3 4.0	−0.2092	0.5460	−0.2761	+31	−55
ψ Virginis	5.0	2.54	18.1	9 5.0		21 53.8	+ 9 35.4	−0.5185	0.5497	0.2712	+15	−75
49 Virginis	5.2	2.54	18.2	10 17.5	31	3 52.3	− 8 38.6	−0.9229	0.5533	0.2656	− 8	−90
i Virginis	5.7	2.54	18.2	12 16.2		12 2.9	− 0 45.4	−1.0952	0.5586	0.2562	−21	−90
75 Virginis	5.6	2.54	18.0	14 55.9		14 39.9	+ 1 45.9	+0.8722	0.5603	0.2527	+75	+ 3
83 Virginis	5.6	+2.54	−17.8	−15 45.4		19 36.0	+ 6 31.2	+0.4592	0.5637	−0.2456	+63	−20
85 Virginis	6.1	+2.54	−17.9	−15 20.7		20 3.9	+ 6 58.2	−0.0613	0.5640	−0.2448	+35	−47

APRIL.

Name.	Mag.	Δα	Δδ	Apparent Declination.	d	h m	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
43 H. Virginis	5.5	+2.53	−17.3	−17 48.6	1	8 25.6	− 5 7.9	−0.5240	0.5727	−0.2233	+ 8	−77
31 G. Virginis	6.4	2.53	17.2	18 11.7		9 6.0	− 4 29.0	−0.2922	0.5732	0.2220	+20	−61
36 G. Virginis	5.7	2.53	17.2	18 19.6		9 44.6	− 3 51.9	−0.3043	0.5737	0.2207	+19	−61
9 G. Libræ	6.5	2.53	16.6	20 4.3		16 16.4	+ 2 24.9	+0.0226	0.5783	0.2071	+34	−42
17 G. Libræ	6.4	2.53	16.2	20 49.2		20 47.2	+ 6 45.1	−0.1483	0.5813	0.1969	+25	−52
18 G. Libræ	6.1	+2.53	−16.2	−20 58.4		21 11.9	+ 7 8.9	−0.0779	0.5816	−0.1960	+28	−48
43 B. Libræ	5.7	2.54	16.4	21 2.3	2	1 11.5	+10 59.0	−0.7781	0.5843	0.1864	−10	−90
47 G. Libræ	6.1	2.51	15.5	21 42.4		4 44.0	− 9 37.0	−0.7617	0.5866	0.1776	−10	−90
64 G. Libræ	5.8	2.50	15.2	22 5.4		8 35.0	− 5 55.3	−1.0464	0.5889	0.1675	−29	−90
153 B. Libræ	6.3	2.49	14.2	24 12.3		14 59.3	+ 0 13.4	+0.0337	0.5925	0.1500	+29	−42
42 Libræ	5.0	+2.47	−14.1	−23 32.8		17 42.5	+ 2 49.9	−1.0181	0.5939	−0.1422	−29	−90
b Scorpii	4.7	2.47	13.2	25 29.8		21 43.8	+ 6 41.3	+0.3718	0.5957	0.1305	+45	−23
A Scorpii	4.6	2.46	13.2	25 4.7		22 43.6	+ 7 38.6	−0.1742	0.5962	0.1275	+16	−54
31 B. Scorpii	5.4	2.45	13.4	24 17.1		22 50.6	+ 7 45.3	−0.9780	0.5962	0.1271	−28	−90
3 Scorpii	5.9	2.46	13.2	24 59.8		23 7.3	+ 8 1.3	−0.3054	0.5963	0.1263	+10	−62
4 Scorpii	5.7	+2.47	−12.9	−26 1.2		23 25.6	+ 8 18.8	+0.6743	0.5964	−0.1254	+62	− 6
40 B. Scorpii	5.4	2.45	13.1	24 35.4	3	0 36.0	+ 9 26.4	−0.8927	0.5970	0.1218	−23	−90
π Scorpii	3.0	2.46	12.8	25 52.4		0 41.1	+ 9 31.3	+0.3738	0.5970	0.1216	+45	−23
48 B. Scorpii	4.9	2.45	12.7	25 38.0		2 22.5	+11 8.5	−0.0672	0.5977	0.1165	+21	−47
50 B. Scorpii	6.4	2.43	13.0	24 29.8		2 36.0	+11 21.4	−1.2248	0.5977	0.1158	−50	−84
65 B. Scorpii	5.5	+2.44	−12.3	−26 6.2		4 9.1	−11 9.4	+0.1989	0.5982	−0.1110	+34	−32
85 B. Scorpii	6.0	2.42	12.3	25 15.9		6 41.4	− 8 43.5	−0.9077	0.5991	0.1031	−25	−90
σ Scorpii	3.1	2.40	12.0	25 23.6		9 2.0	− 6 28.8	−1.0138	0.5997	0.0957	−33	−90
α Scorpii	1.2	2.39	11.4	26 14.8		12 4.4	− 3 34.0	−0.4381	0.6004	0.0860	− 1	−72
116 B. Scorpii	6.2	2.39	11.3	26 21.4		12 48.3	− 2 52.0	−0.3913	0.6006	0.0837	+ 1	−69
τ Scorpii	2.9	+2.40	−10.6	−28 2.6		14 26.8	− 1 17.6	+1.1613	0.6009	−0.0784	+62	+33
134 B. Scorpii	6.4	2.36	10.5	27 18.0		17 34.1	+ 1 41.7	+0.1900	0.6013	0.0683	+30	−33
135 B. Scorpii	6.0	2.38	10.1	28 21.3		17 49.0	+ 1 56.0	+1.2284	0.6013	0.0674	+62	+42
118 B. Ophiuchi	6.2	2.28	9.7	26 24.1	4	1 55.7	+ 9 42.0	−1.1681	0.6016	0.0408	−50	−90
95 G. Ophiuchi	6.1	2.28	9.0	27 39.6		3 57.3	+11 38.5	+0.0196	0.6014	0.0341	+18	−43
36 Oph. (*1st star*)	5.4	+2.24	− 9.6	−26 28.9		5 4.4	−11 17.3	−1.2009	0.6013	−0.0304	−54	−85

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
43 Ophiuchi	5.4	+2.25	−8.4	−28 3.8	4 7 59.7	− 8 29.3	+0.3149	0.6009	−0.0207	+33	−20
163 G. Ophiuchi	6.3	2.17	7.5	27 50.8	15 23.9	− 1 23.9	+0.0333	0.5991	+0.0037	+16	−42
X Sagittarii (*var.*)	4.4	2.15	7.3	27 48.1	16 59.3	+ 0 7.6	−0.0019	0.5985	0.0089	+15	−44
4 G. Sagittarii	6.2	2.13	7.6	26 56.9	17 20.3	+ 0 27.6	−0.8609	0.5984	0.0100	−31	−90
10 G. Sagittarii	5.7	2.12	6.8	28 3.2	20 23.9	+ 3 23.6	+0.3030	0.5973	0.0200	+32	−20
210 B. Scorpii	5.8	+2.12	−6.4	−28 45.1	21 7.3	+ 4 5.2	+1.0249	0.5970	+0.0223	+61	−20
38 B. Sagittarii	4.7	2.08	6.0	28 28.1	5 0 40.3	+ 7 29.4	+0.8390	0.5954	0.0337	+62	+ 6
48 G. Sagittarii	6.3	2.04	5.7	28 19.1	4 11.5	+10 51.9	+0.8256	0.5936	0.0448	+62	+ 5
62 B. Sagittarii	6.0	2.04	5.5	28 41.0	4 11.7	+10 52.0	+1.1960	0.5936	0.0448	+61	−35
66 B. Sagittarii	4.7	2.01	6.0	27 4.5	4 27.9	+11 7.5	−0.4236	0.5935	0.0456	− 4	−71
58 G. Sagittarii	6.1	+2.02	−5.4	−28 28.3	5 56.7	−11 27.3	+1.0648	0.5927	+0.0503	+62	+23
68 G. Sagittarii	6.2	1.96	5.7	26 41.3	8 9.5	− 9 20.0	−0.6293	0.5914	0.0571	−14	−90
69 G. Sagittarii	6.3	1.96	5.6	26 48.6	8 18.0	− 9 11.7	−0.4962	0.5913	0.0575	− 6	−77
86 B. Sagittarii	6.5	1.95	5.6	26 38.3	8 37.5	− 8 53.1	−0.6524	0.5910	0.0585	−15	−90
φ Sagittarii	3.3	1.89	4.6	27 4.8	15 3.1	− 2 43.1	+0.2359	0.5870	0.0778	+33	−30
σ Sagittarii	2.1	+1.83	−4.4	−26 24.3	18 48.6	+ 0 53.4	−0.1411	0.5843	+0.0888	+15	−52
201 B. Sagittarii	5.9	1.74	3.6	26 3.1	6 1 55.1	+ 7 43.0	+0.1991	0.5789	0.1086	+34	−32
ψ Sagittarii	4.9	1.72	3.8	25 24.3	2 51.1	+ 8 36.8	−0.3614	0.5781	0.1111	+ 6	−66
χ Sagittarii	4.9	1.66	3.6	24 40.5	6 46.8	−11 36.6	−0.6550	0.5748	0.1215	− 9	−90
49 Sagittarii	5.5	1.64	3.7	24 7.8	6 52.8	−11 30.9	−1.2032	0.5747	0.1217	−46	−88
51 Sagittarii	5.8	+1.61	−3.0	−24 54.4	11 9.6	− 7 23.9	+0.1391	0.5711	+0.1326	+34	−30
h Sagittarii	4.7	1.61	2.9	25 4.4	11 26.0	− 7 8.1	+0.3469	0.5708	0.1333	+45	−24
53 Sagittarii	6.3	1.57	3.2	23 37.4	12 44.5	− 5 52.5	−0.9722	0.5697	0.1365	−26	−90
274 B. Sagittarii	6.1	1.57	3.2	23 37.5	12 51.7	− 5 45.6	−0.9531	0.5696	0.1368	−25	−90
308 B. Sagittarii	6.3	1.50	2.5	24 9.2	18 45.7	− 0 4.8	+0.4410	0.5644	0.1508	+52	−19
329 B. Sagittarii	6.1	+1.45	−2.4	−22 58.3	21 46.2	+ 2 49.0	−0.3183	0.5617	+0.1575	+13	−63
336 B. Sagittarii	6.5	1.44	2.4	22 50.1	22 46.2	+ 3 46.8	−0.3022	0.5608	0.1597	+14	−62
4 Capricorni	5.7	1.36	2.0	22 4.4	7 4 55.1	+ 9 42.4	−0.0706	0.5552	0.1727	+27	−45
19 Capricorni	5.7	1.13	1.6	18 14.8	21 22.8	+ 1 35.9	−0.9711	0.5407	0.2026	−17	−90
20 Capricorni	6.2	1.12	1.0	19 21.9	23 34.5	+ 3 43.2	+0.6506	0.5388	0.2061	+69	− 9
21 Capricorni	6.5	+1.09	−1.4	−17 51.8	8 0 10.6	+ 4 18.0	−0.8010	0.5383	+0.2070	− 7	−90
θ Capricorni	4.2	1.07	1.3	17 34.3	2 32.1	+ 6 34.8	−0.6154	0.5363	0.2105	+ 4	−85
114 B. Capricorni	6.1	1.02	0.9	17 41.8	6 50.2	+10 44.4	+0.4355	0.5328	0.2167	+60	−20
URANUS	6.0	. . .	. . .	16 58.8	6 51.7	+10 45.9	−0.3138	0.5314	0.2164	+20	−62
31 Capricorni	6.3	1.01	0.7	17 49.2	8 19.6	−11 49.0	+0.8888	0.5316	0.2187	+72	+ 5
ι Capricorni	4.3	+0.98	−0.7	−17 11.8	10 13.8	− 9 58.5	+0.6527	0.5302	+0.2212	+72	− 9
42 Capricorni	5.1	0.86	0.8	14 25.6	19 36.2	− 0 54.0	−0.1440	0.5232	0.2324	+31	−51
44 Capricorni	6.0	0.86	0.6	14 47.3	20 20.6	− 0 11.1	+0.4110	0.5226	0.2332	+61	−22
45 Capricorni	5.8	0.86	0.4	15 8.4	20 48.3	+ 0 15.8	+0.8901	0.5223	0.2337	+75	+ 5
151 B. Capricorni	6.1	0.82	0.8	13 7.2	23 37.3	+ 2 59.6	−0.5875	0.5204	0.2366	+ 9	−82
μ Capricorni	5.2	+0.82	−0.4	−13 57.2	9 1 23.6	+ 4 42.5	+0.7166	0.5192	+0.2383	+76	− 6
e Aquarii	5.4	0.72	0.2	11 59.0	10 9.0	−10 48.0	+0.7474	0.5138	0.2458	+78	− 4
150 B. Aquarii	6.0	0.66	0.7	9 27.8	13 22.0	− 7 40.8	−1.1422	0.5119	0.2483	−23	−90
167 G. Aquarii	6.3	0.57	0.1	8 20.4	10 0 30.7	+ 3 8.3	+0.4613	0.5064	0.2550	+68	−20
67 Aquarii	6.4	0.55	0.1	7 24.5	3 4.8	+ 5 37.9	+0.1205	0.5053	0.2563	+49	−37
252 B. Aquarii	5.8	+0.49	−0.1	− 5 26.4	9 24.7	+11 46.8	−0.3605	0.5028	+0.2587	+24	−61
197 G. Aquarii	6.3	0.48	0.0	5 15.9	10 32.2	−11 7.6	−0.2590	0.5024	0.2591	+30	−38
263 B. Aquarii	6.1	0.46	+0.2	5 10.1	12 48.0	− 8 55.6	+0.2249	0.5017	0.2598	+55	−32
293 B. Aquarii	5.5	0.41	0.4	3 57.6	20 20.9	− 1 35.6	+0.8916	0.4995	0.2614	+86	+ 3
13 Piscium	6.4	0.34	0.7	1 33.3	11 5 14.0	+ 7 2.6	+0.6211	0.4976	0.2619	+83	−12
14 Piscium	5.9	+0.34	+0.8	− 1 43.0	6 25.2	+ 8 11.8	+1.1073	0.4974	+0.2619	+88	−17
λ Piscium	4.6	0.29	0.6	+ 1 18.7	10 44.4	−11 36.2	−1.0436	0.4968	0.2616	−13	−80
21 Piscium	5.6	0.28	1.0	0 36.3	14 46.7	− 7 40.7	+0.7802	0.4965	0.2611	+90	− 3
22 Piscium	5.8	0.26	0.8	2 27.5	16 8.9	− 6 20.7	−0.8752	0.4963	0.2609	− 2	−83
25 Piscium	6.2	+0.26	+1.0	+ 1 37.1	16 45.5	− 5 45.1	+0.1958	0.4962	+0.2608	+54	−33
				NEW	*MOON.*						

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
Arietis (*mean*)	4.6	+0.16	+7.2	+21 0.2	15 18 43.0	− 6 37.2	+0.9826	0.5236	+0.1644	+90	+23
Arietis	5.8	0.22	8.3	24 25.6	16 6 50.7	+ 5 7.5	−0.9587	0.5292	0.1419	−11	−66
Tauri	5.9	0.26	8.4	24 10.9	11 41.6	+ 9 49.1	−0.0233	0.5313	0.1323	+42	−28
Tauri	6.1	0.28	8.7	25 3.5	14 41.0	−11 17.3	−0.6095	0.5326	0.1262	+10	−60
Tauri	5.4	0.30	8.6	24 1.5	16 36.3	− 9 25.8	+0.7769	0.5334	0.1223	+90	+14
Tauri	3.8	+0.31	+8.5	+23 51.0	16 38.5	− 9 23.6	+0.9770	0.5334	+0.1222	+90	+27
Tauri	5.6	0.30	8.7	24 34.6	16 45.9	− 9 16.4	+0.1846	0.5335	0.1219	+55	−17
Tauri	4.3	0.31	8.6	24 12.2	16 47.6	− 9 14.7	+0.6012	0.5335	0.1219	+86	+ 5
Tauri	4.1	0.31	8.6	24 6.3	17 5.2	− 8 57.8	+0.7465	0.5336	0.1213	+90	+13
Tauri	5.8	0.31	8.6	24 17.5	17 7.3	− 8 55.7	+0.5430	0.5336	0.1212	+81	+ 2
Tauri	6.5	+0.31	+8.6	+24 16.0	17 11.3	− 8 51.9	+0.5804	0.5337	+0.1210	+84	+ 4
Tauri	4.3	0.31	8.5	23 41.2	17 19.7	− 8 43.8	+1.2411	0.5337	0.1208	+84	+50
Tauri	3.0	0.32	8.6	23 50.7	17 52.3	− 8 12.2	+1.1299	0.5340	0.1196	+90	+39
Tauri	3.7	0.32	8.6	23 47.8	18 39.8	− 7 26.2	+1.2781	0.5343	0.1180	+76	+56
Tauri	5.2	0.32	8.6	23 52.8	18 40.4	− 7 25.6	+1.1865	0.5343	0.1180	+90	+44
Tauri	5.3	+0.32	+8.8	+25 19.6	19 10.8	− 6 56.2	−0.3610	0.5345	+0.1169	+23	−45
Tauri	5.6	0.41	9.3	26 15.8	17 4 44.6	+ 2 18.7	−0.3820	0.5382	0.0962	+22	−44
Tauri	5.0	0.46	9.6	27 9.1	9 7.6	+ 6 33.0	−0.9689	0.5397	0.0863	−15	−63
Tauri	5.3	0.47	9.2	25 25.9	10 10.8	+ 7 34.1	+1.0303	0.5401	0.0839	+90	+35
Aurigæ	6.0	0.63	9.9	27 45.5	23 55.3	− 3 9.3	−0.6198	0.5440	0.0517	+ 8	−56
Aurigæ	6.5	+0.70	+9.8	+27 34.9	18 5 16.8	+ 2 1.3	−0.1794	0.5452	+0.0388	+33	−27
Aurigæ	6.0	0.72	9.8	27 55.6	7 34.7	+ 4 14.4	−0.4803	0.5456	0.0332	+16	−45
Tauri	6.4	0.79	9.8	27 52.5	12 38.2	+ 9 7.5	−0.2856	0.5464	0.0208	+27	−32
Tauri	1.8	0.83	9.8	28 32.4	15 0.1	+11 24.6	−0.9793	0.5467	0.0150	−16	−61
Aurigæ	6.5	0.88	9.4	27 36.6	19 20.2	− 8 24.3	+0.0913	0.5471	0.0042	+49	− 9
Aurigæ	5.7	+0.89	+9.2	+26 52.5	19 53.7	− 7 52.0	+0.9073	0.5471	+0.0028	+90	+34
Tauri	5.6	0.98	9.4	27 56.8	19 2 3.3	− 1 55.1	−0.3077	0.5475	−0.0125	+26	−32
Tauri	4.6	0.99	9.2	27 35.7	3 7.0	− 0 53.6	+0.0649	0.5475	0.0151	+47	−12
Tauri	6.1	1.04	9.0	27 34.3	6 33.0	+ 2 25.3	+0.0252	0.5475	0.0237	+45	−15
Aurigæ	5.1	1.26	8.3	28 5.5	21 50.2	− 6 49.2	−1.1963	0.5464	0.0614	−38	−62
Geminorum	5.7	+1.36	+6.8	+25 29.1	20 6 55.6	+ 1 57.4	+1.0077	0.5449	−0.0832	+90	+33
Geminorum	6.2	1.39	6.9	26 11.7	8 29.4	+ 3 28.0	+0.0959	0.5446	0.0869	+49	−17
Geminorum	6.3	1.39	6.8	26 1.9	8 47.4	+ 3 45.4	+0.2484	0.5445	0.0876	+59	−10
Geminorum	6.1	1.48	5.8	25 2.1	15 41.9	+10 25.8	+0.6762	0.5430	0.1037	+90	+11
Geminorum	5.1	1.53	5.6	25 13.0	19 41.4	− 9 42.9	+0.0456	0.5420	0.1129	+46	−22
Geminorum	6.3	+1.62	+4.6	+24 33.2	21 2 26.7	− 3 11.3	−0.0453	0.5403	−0.1279	+41	−29
Geminorum	6.0	1.62	4.6	24 25.0	2 53.2	− 2 45.7	+0.0453	0.5402	0.1289	+46	−24
Geminorum	6.3	1.61	4.1	23 13.0	3 43.3	− 1 57.3	+1.2402	0.5399	0.1307	+84	+49
Geminorum	3.7	1.65	4.4	24 36.2	5 17.7	− 0 26.0	−0.4742	0.5395	0.1341	+17	−53
Geminorum	6.3	1.66	3.8	23 21.2	7 12.4	+ 1 24.8	+0.6225	0.5389	0.1382	+88	+ 4
Cancri	6.4	+1.74	+3.3	+23 49.1	12 57.3	+ 6 58.1	−0.7107	0.5373	−0.1503	+ 4	−66
Cancri	6.2	1.76	2.7	22 52.8	15 25.5	+ 9 21.4	−0.0732	0.5366	0.1554	+39	−33
Cancri	5.5	1.75	2.2	21 49.8	16 7.1	+10 1.6	+0.9523	0.5363	0.1568	+90	+22
Cancri	6.4	1.81	2.5	23 23.7	18 51.6	−11 19.3	−1.1740	0.5355	0.1623	−30	−67
Cancri	6.0	1.82	1.3	21 1.0	22 0.1	− 8 17.0	+0.8687	0.5346	0.1685	+90	+15
Cancri	5.5	+1.88	+0.5	+20 43.8	22 3 48.9	− 2 39.6	+0.1623	0.5329	−0.1796	+53	−24
Cancri	6.5	1.92	0.0	20 18.5	7 18.8	+ 0 43.4	−0.0247	0.5319	0.1860	+42	−34
Cancri	6.5	1.92	0.0	20 16.3	7 21.3	+ 0 45.9	+0.0066	0.5319	0.1861	+44	−32
Cancri	6.5	1.91	−0.2	19 58.3	7 26.5	+ 0 50.9	+0.3128	0.5319	0.1862	+62	−17
Cancri	6.3	1.91	0.2	19 50.8	7 29.0	+ 0 53.3	+0.4390	0.5319	0.1863	+71	−11
Cancri	6.1	+1.96	−1.1	+19 9.0	12 22.6	+ 5 37.4	+0.2490	0.5305	−0.1950	+58	−21
Cancri	6.4	2.06	4.0	15 43.9	23 3 1.6	− 4 11.9	+0.8415	0.5270	0.2188	+90	+ 7
Leonis	6.3	2.10	3.8	16 57.1	5 5.0	− 2 12.5	−0.9018	0.5266	0.2219	− 6	−73
Leonis	6.2	2.12	5.2	14 45.5	10 6.3	+ 2 39.3	+0.2808	0.5258	0.2290	+59	−24
Leonis	6.5	2.13	5.3	14 43.8	11 8.6	+ 3 39.6	+0.0710	0.5256	0.2305	+47	−34
Leonis	5.6	+2.15	−5.7	+14 24.6	13 54.9	+ 6 20.7	−0.2350	0.5252	−0.2342	+31	−51

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1915.0. Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
47 B. Arietis	6.5	+0.74	+10.2	+17 37.7	22 17 41.6	+11 45.3	+0.0639	0.5058	+0.2047	+48	−33
20 H¹. Arietis	6.4	0.76	10.0	16 49.7	18 32.1	−11 25.7	+1.1192	0.5062	0.2036	+90	+27
15 Arietis	5.9	0.75	10.8	19 6.2	19 9.4	−10 49.5	−1.2686	0.5065	0.2027	−36	−71
θ Arietis	5.6	0.80	11.0	19 30.7	23 1.8	− 7 3.9	−0.9464	0.5083	0.1975	− 9	−70
26 Arietis	6.2	0.88	11.2	19 28.9	23 5 25.2	− 0 52.0	+0.3194	0.5116	0.1882	+63	−18
ν Arietis	5.4	+0.94	+12.0	+21 35.9	9 32.1	+ 3 7.5	−1.2611	0.5138	+0.1820	−38	−68
μ Arietis	5.7	0.96	11.3	19 39.2	11 20.4	+ 4 52.5	+1.2176	0.5148	0.1792	+90	+39
ε Arietis (*mean*)	4.6	1.08	11.9	21 0.3	19 41.9	−11 1.5	+1.1626	0.5196	0.1654	+90	+36
64 Arietis	5.8	1.25	12.9	24 25.6	24 7 50.8	+ 0 44.5	−0.7480	0.5268	0.1434	+ 2	−65
7 Tauri	5.9	1.32	12.7	24 11.0	12 41.0	+ 5 25.4	+0.1928	0.5298	0.1340	+55	−18
11 Tauri	6.1	+1.37	+13.0	+25 3.5	15 39.7	+ 8 18.3	−0.3847	0.5315	+0.1280	+22	−47
16 Tauri	5.4	1.39	12.5	24 1.6	17 34.4	+10 9.2	+0.9975	0.5327	0.1241	+90	+28
17 Tauri	3.8	1.39	12.5	23 51.0	17 36.6	+10 11.4	+1.1965	0.5327	0.1240	+90	+45
18 Tauri	5.6	1.40	12.7	24 34.6	17 44.0	+10 18.5	+0.4088	0.5328	0.1238	+70	− 5
q Tauri	4.3	1.40	12.6	24 12.3	17 45.6	+10 20.0	+0.8231	0.5328	0.1237	+90	+17
20 Tauri	4.1	+1.40	+12.6	+24 6.4	18 3.2	+10 37.1	+0.9681	0.5330	+0.1231	+90	+26
21 Tauri	5.8	1.40	12.6	24 17.6	18 5.3	+10 39.1	+0.7658	0.5330	0.1231	+90	+14
22 Tauri	6.5	1.40	12.6	24 16.0	18 9.2	+10 42.9	+0.8031	0.5330	0.1229	+90	+16
14 H. Tauri	5.3	1.44	12.9	25 19.6	20 8.0	−11 22.2	−0.1294	0.5342	0.1188	+36	−32
p Tauri	5.6	1.58	12.8	26 15.8	25 5 36.2	− 2 12.9	−0.1336	0.5397	0.0983	+36	−31
φ Tauri	5.0	+1.65	+12.8	+27 9.1	9 55.7	+ 1 57.8	−0.7084	0.5421	+0.0885	+ 3	−63
χ Tauri	5.3	1.66	12.2	25 26.0	10 58.0	+ 2 58.1	+1.2757	0.5426	0.0861	+72	+59
17 B. Aurigæ	6.0	1.87	11.9	27 45.6	26 0 26.9	− 8 0.9	−0.3395	0.5493	0.0537	+24	−38
38 B. Aurigæ	6.5	1.94	11.4	27 34.9	5 40.8	− 2 58.0	+0.1033	0.5515	0.0406	+50	−13
47 B. Aurigæ	6.0	1.98	11.3	27 55.6	7 55.1	− 0 48.4	−0.1911	0.5524	0.0350	+33	−28
354 B. Tauri	6.4	+2.04	+10.8	+27 52.5	12 50.0	+ 3 56.0	+0.0074	0.5542	+0.0224	+44	−10
22 Aurigæ	6.4	2.08	10.9	28 51.6	13 51.4	+ 4 55.3	−1.0476	0.5545	0.0197	−22	−61
β Tauri	1.8	2.09	10.7	28 32.4	15 7.7	+ 6 8.8	−0.6744	0.5549	0.0164	+ 5	−57
107 B. Aurigæ	6.5	2.13	10.0	27 36.6	19 19.7	+10 11.9	+0.3865	0.5562	0.0055	+69	+ 5
112 B. Aurigæ	5.7	2.12	9.8	26 52.5	19 52.1	+10 43.1	+1.1917	0.5563	+0.0040	+86	+55
406 B. Tauri	5.6	+2.21	+ 9.3	+27 56.8	27 1 49.1	− 7 32.6	+0.0001	0.5577	−0.0117	+44	−15
136 Tauri	4.6	2.22	9.1	27 35.7	2 50.5	− 6 33.4	+0.3681	0.5579	0.0144	+68	+ 3
154 B. Aurigæ	6.4	2.26	9.2	28 55.9	4 12.7	− 5 14.2	−1.1082	0.5581	0.0181	−28	−61
415 B. Tauri	6.1	2.26	8.7	27 34.3	6 9.0	− 3 22.1	+0.3320	0.5584	0.0232	+65	+ 1
49 Aurigæ	5.1	2.42	6.8	28 5.5	20 49.5	+10 46.6	−0.8576	0.5594	0.0622	− 7	−60
54 Aurigæ	5.8	+2.44	+ 6.5	+28 20.5	22 41.4	−11 25.5	−1.2469	0.5594	−0.0671	−47	−6
39 Geminorum	6.2	2.46	4.9	26 11.7	28 7 0.7	− 3 24.3	+0.4182	0.5587	0.0889	+71	− 1
40 Geminorum	6.3	2.46	4.8	26 1.9	7 17.8	− 3 7.8	+0.5682	0.5586	0.0896	+84	+ 7
47 Geminorum	5.6	2.52	4.2	26 59.9	12 25.7	+ 1 49.0	−0.9634	0.5579	0.1027	−14	−63
52 Geminorum	6.1	2.49	3.7	25 2.1	13 53.6	+ 3 13.9	+0.9906	0.5576	0.1064	+90	+30
134 B. Geminorum	6.5	+2.54	+ 3.7	+26 50.7	14 53.0	+ 4 11.1	−1.0573	0.5574	−0.1089	−21	−63
A Geminorum	5.1	2.52	3.1	25 12.9	17 42.0	+ 6 54.1	+0.3721	0.5568	0.1159	+67	− 6
176 B. Geminorum	6.3	2.54	2.0	24 33.1	29 0 8.5	−10 53.1	+0.2835	0.5552	0.1316	+61	−12
181 B. Geminorum	6.0	2.54	1.9	24 25.0	0 33.9	−10 28.6	+0.3725	0.5551	0.1326	+67	− 8
κ Geimnorum	3.7	2.55	1.6	24 36.2	2 51.7	− 8 15.7	−0.1378	0.5544	0.1381	+36	−34
82 Geminorum	6.3	+2.53	+ 1.1	+23 21.2	4 41.1	− 6 30.1	+0.9396	0.5538	−0.1423	+90	+13
5 B. Cancri	6.4	2.56	+ 0.3	23 49.1	10 10.2	− 1 12.6	−0.3716	0.5520	0.1549	+23	−48
9 Cancri	6.2	2.55	− 0.2	22 52.7	12 31.7	+ 1 4.0	+0.2543	0.5512	0.1602	+59	−17
μ Cancri	5.5	2.52	0.4	21 49.7	13 11.4	+ 1 42.3	+1.2624	0.5510	0.1616	+83	+48
35 B. Cancri	6.4	2.57	0.7	23 23.6	15 48.6	+ 4 14.0	−0.8295	0.5500	0.1674	− 3	−67
49 B. Cancri	6.0	+2.52	− 1.3	+21 1.0	18 48.7	+ 7 7.9	+1.1785	0.5489	−0.1738	+90	+37
η Cancri	5.5	2.52	2.2	20 43.8	30 0 22.6	−11 29.7	+0.4803	0.5467	0.1851	+74	− 8
39 Cancri	6.5	2.52	2.7	20 18.5	3 43.8	− 8 15.5	+0.2935	0.5453	0.1917	+61	−18
40 Cancri	6.5	2.52	2.7	20 16.3	3 46.1	− 8 13.2	+0.3243	0.5453	0.1918	+63	−16
102 B. Cancri	6.5	2.51	2.7	19 58.2	3 51.1	− 8 8.4	+0.6260	0.5452	0.1920	+87	− 1
Cancri	6.3	+2.51	− 2.7	+19 50.7	3 53.5	− 8 6.1	+0.7502	0.5452	−0.1920	+90	+ 6

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.		Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d	h m	h m				°	°
. Cancri	6.1	+2.49	− 3.5	+19 9.0	30	8 35.5	− 3 33.7	+0.5591	0.5433	−0.2009	+81	− 5
. Cancri	6.4	2.41	5.5	15 43.9		22 43.5	+10 6.0	+1.1288	0.5375	0.2249	+90	+26
. Leonis	6.3	2.43	5.8	16 57.1	31	0 43.1	−11 58.4	−0.5996	0.5367	0.2279	+12	−70
Leonis	6.2	2.38	6.4	14 45.5		5 35.8	− 7 15.3	+0.5633	0.5348	0.2349	+80	− 9
Leonis	6.5	2.38	6.6	14 43.8		6 36.4	− 6 16.6	+0.3537	0.5344	0.2363	+64	−20
Leonis	5.6	+2.37	− 6.9	+14 24.5		9 18.5	− 3 39.8	+0.0450	0.5334	−0.2400	+46	−36
Leonis	5.0	2.32	7.7	12 50.9		16 13.2	+ 3 1.5	−0.0194	0.5310	0.2485	+43	−41
Leonis	4.6	2.26	8.1	10 24.7		20 53.0	+ 7 32.3	+1.3389	0.5295	0.2537	+83	+43
Leonis	1.3	+2.29	− 8.3	+12 22.8		21 6.1	+ 7 45.0	−0.7593	0.5294	−0.2540	+ 4	−78

FEBRUARY.

Name.	Mag.	Δα	Δδ	Apparent Declination.	d	h m	Hour Angle, H	Y	x'	y'	N.	S.
Leonis	5.9	+2.20	− 8.9	+ 9 12.9	1	5 15.6	− 8 21.0	+0.4174	0.5272	−0.2618	+68	−20
Leonis	5.8	2.21	9.2	10 11.6		6 24.9	− 7 13.9	−0.8983	0.5269	0.2628	− 4	−80
Leonis	3.8	2.20	9.4	9 44.5		8 55.5	− 4 48.1	−1.0922	0.5264	0.2648	−16	−80
Leonis	5.2	+2.16	− 9.2	+ 7 23.3		9 54.6	− 3 50.9	+1.0782	0.5261	−0.2656	+90	+16
Leonis	5.7	2.18	9.4	9 5.2		10 0.8	− 3 44.9	−0.7040	0.5261	0.2656	+ 7	−80
Sextantis	6.3	2.12	9.8	6 49.1		15 24.6	+ 1 28.7	+0.1942	0.5251	0.2694	+54	−33
Leonis	6.1	2.09	10.1	6 38.2		20 15.8	+ 6 10.8	−0.9321	0.5244	0.2723	− 6	−83
Leonis	5.0	2.04	9.9	4 4.3		22 29.5	+ 8 20.3	+1.1012	0.5241	0.2734	+90	+17
Leonis	5.4	+1.97	−10.4	+ 2 28.5	2	6 41.3	− 7 43.3	+0.4855	0.5235	−0.2766	+73	−19
Leonis	6.0	1.96	10.4	2 6.8		7 29.4	− 6 56.8	+0.6347	0.5235	0.2768	+84	−11
Leonis	5.5	1.95	10.5	+ 1 52.3		9 59.9	− 4 31.0	+0.1876	0.5235	0.2774	+54	−34
Leonis	4.5	1.88	10.6	− 0 21.4		16 19.3	+ 1 36.6	+0.7147	0.5237	0.2784	+90	− 7
3. Virginis	6.5	1.71	10.6	5 15.0	3	10 28.2	− 4 48.8	+0.6737	0.5267	0.2759	+84	− 9
Virginis	4.8	+1.60	−10.7	− 7 31.9		22 26.0	+ 6 46.0	−0.2694	0.5305	−0.2700	+29	−59
Virginis	5.0	1.52	10.6	9 4.8	4	5 33.6	−10 20.4	−0.5980	0.5335	0.2648	+11	−82
Virginis	5.2	1.46	10.5	10 17.3		11 52.4	− 4 14.1	−1.0230	0.5365	0.2592	−14	−90
Virginis	5.7	1.38	10.3	12 16.1		20 31.3	+ 4 7.6	−1.2134	0.5413	0.2499	−30	−90
Virginis	5.6	1.34	9.5	14 55.7		23 17.4	+ 6 48.0	+0.8005	0.5428	0.2465	+75	− 1
Virginis	5.6	+1.30	− 9.4	−15 45.3	5	4 30.8	+11 50.7	+0.3692	0.5462	−0.2395	+58	−25
Virginis	6.1	1.29	9.5	15 20.6		5 0.3	−11 40.8	−0.1655	0.5465	0.2388	+29	−53
H. Virginis	5.5	1.15	9.1	17 48.4		18 4.8	+ 0 56.2	−0.6579	0.5554	0.2180	+ 1	−90
G. Virginis	6.4	1.14	9.0	18 11.6		18 47.5	+ 1 37.3	−0.4212	0.5559	0.2168	+14	−69
G. Virginis	5.7	1.14	9.0	18 19.5		19 28.3	+ 2 16.6	−0.4345	0.5564	0.2155	+13	−71
G. Libræ	6.5	+1.06	− 8.5	−20 4.2	6	2 21.9	+ 8 55.2	−0.1079	0.5614	−0.2025	+28	−50
G. Libræ	6.4	1.01	8.4	20 49.1		7 7.2	−10 30.0	−0.2885	0.5649	0.1927	+18	−61
G. Libræ	6.1	1.01	8.3	20 58.3		7 33.1	−10 5.1	−0.2160	0.5652	0.1918	+21	−57
B. Libræ	5.7	0.97	8.6	21 2.1		11 45.2	− 6 2.4	−0.9381	0.5683	0.1826	−19	−90
G. Libræ	6.1	0.92	8.2	21 42.2		15 28.5	− 2 27.6	−0.9249	0.5710	0.1741	−19	−90
G. Libræ	5.8	+0.87	− 8.2	−22 5.3		19 30.7	+ 1 25.4	−1.2195	0.5738	−0.1644	−44	−89
B. Libræ	6.3	0.80	7.5	24 12.2	7	2 12.7	+ 7 51.9	−0.1219	0.5784	0.1475	+21	−51
Libræ	5.0	0.77	7.8	23 32.7		5 3.0	+10 35.4	−1.1976	0.5803	0.1401	−44	−90
Scorpii	4.7	0.72	7.1	25 29.7		9 14.2	− 9 23.3	+0.2165	0.5830	0.1287	+37	−32
Scorpii	4.6	0.71	7.3	25 4.6		10 16.4	− 8 23.5	−0.3408	0.5836	0.1258	+ 8	−65
B. Scorpii	5.4	+0.71	− 7.6	−24 17.0		10 23.8	− 8 16.4	−1.1599	0.5836	−0.1254	−42	−90
Scorpii	5.9	0.71	7.3	24 59.7		10 41.0	− 7 59.9	−0.4748	0.5838	0.1247	+ 1	−75
Scorpii	5.7	0.70	7.0	26 1.1		11 0.1	− 7 41.6	+0.5231	0.5840	0.1237	+54	−15
B. Scorpii	5.4	0.69	7.5	24 35.3		12 13.2	− 6 31.4	−1.0740	0.5848	0.1203	−35	−90
Scorpii	3.0	0.69	7.0	25 52.3		12 18.5	− 6 26.3	+0.2159	0.5848	0.1201	+36	−32
B. Scorpii	4.9	+0.67	− 7.1	−25 37.9		14 3.7	− 4 45.3	−0.2347	0.5858	−0.1151	+12	−58
B. Scorpii	5.5	0.65	7.0	26 6.1		15 54.2	− 2 59.3	+0.0348	0.5868	0.1098	+25	−42
B. Scorpii	6.0	0.62	7.3	25 15.8		18 31.9	− 0 27.9	−1.0925	0.5882	0.1021	−38	−90
Scorpii	3.1	0.60	7.3	25 23.5		20 57.2	+ 1 51.5	−1.2015	0.5894	0.0949	−48	−87
Scorpii	1.2	0.56	7.0	26 14.8	8	0 5.3	+ 4 52.0	−0.6181	0.5908	0.0854	−10	−90
B. Scorpii	6.2	+0.56	− 7.0	−26 21.3		0 50.5	+ 5 35.3	−0.5710	0.5911	−0.0831	− 8	−84

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
τ Scorpii	2.9	+0.54	− 6.4	−28 2.5	8 2 31.9	+ 7 12.6	+1.0037	0.5918	−0.0779	+62	+17
134 B. Scorpii	6.4	0.50	6.8	27 18.0	5 44.5	+10 17.3	+0.0159	0.5930	0.0680	+21	−43
135 B. Scorpii	6.0	0.50	6.4	28 21.2	5 59.7	+10 31.9	+1.0685	0.5931	0.0672	+62	+23
95 G. Ophiuchi	6.1	0.40	6.6	27 39.6	16 21.7	− 3 31.8	−0.1623	0.5957	0.0343	+ 9	−54
43 Ophiuchi	5.4	0.36	6.5	28 3.8	20 28.3	+ 0 24.6	+0.1341	0.5962	−0.0210	+23	−36
163 G. Ophiuchi	6.3	+0.29	− 6.6	−27 50.8	9 3 58.2	+ 7 35.8	−0.1530	0.5963	+0.0034	+ 7	−53
X Sagittarii (*var.*)	4.4	0.28	6.6	27 48.1	5 34.6	+ 9 8.1	−0.1889	0.5962	0.0086	+ 5	−55
4 G. Sagittarii	6.2	0.27	6.8	26 56.9	5 55.8	+ 9 28.4	−1.0538	0.5962	0.0097	−43	−90
10 G. Sagittarii	5.7	0.25	6.5	28 3.2	9 0.8	−11 34.2	+0.1169	0.5958	0.0197	+22	−37
210 B. Scorpii	5.8	0.24	6.4	28 45.1	9 44.5	−10 52.4	+0.8426	0.5957	0.0220	+61	+ 6
38 B. Sagittarii	4.7	+0.21	− 6.4	−28 28.1	13 18.5	− 7 27.2	+0.6540	0.5950	+0.0335	+56	− 6
C. D.−28° 14268	6.4	0.20	6.3	28 55.3	14 46.3	− 6 3.1	+1.1682	0.5946	0.0382	+61	+34
48 G. Sagittarii	6.3	0.18	6.5	28 19.1	16 50.2	− 4 4.2	+0.6390	0.5941	0.0447	+56	− 7
62 B. Sagittarii	6.0	0.18	6.3	28 41.0	16 50.3	− 4 4.1	+1.0107	0.5941	0.0447	+61	+18
66 B. Sagittarii	4.7	0.18	6.8	27 4.6	17 6.6	− 3 48.5	−0.6145	0.5940	0.0456	−14	−90
58 G. Sagittarii	6.1	+0.17	− 6.4	−28 28.3	18 35.4	− 2 23.3	+0.8783	0.5935	+0.0503	+62	+ 8
68 G. Sagittarii	6.2	0.15	6.8	26 41.3	20 48.0	− 0 16.2	−0.8207	0.5927	0.0572	−24	−90
69 G. Sagittarii	6.3	0.15	6.8	26 48.6	20 56.5	− 0 8.1	−0.6873	0.5927	0.0577	−17	−90
86 B. Sagittarii	6.5	0.15	6.8	26 38.3	21 16.1	+ 0 10.7	−0.8439	0.5926	0.0587	−25	−90
φ Sagittarii	3.3	0.10	6.6	27 4.9	10 3 40.1	+ 6 19.2	+0.0458	0.5898	0.0784	+23	−41
σ Sagittarii	2.1	+0.08	− 6.8	−26 24.3	7 23.9	+ 9 53.9	−0.3311	0.5879	+0.0895	+ 5	−65
201 B. Sagittarii	5.9	0.04	6.8	26 3.1	14 25.9	− 7 20.9	+0.0094	0.5838	0.1099	+24	−43
ψ Sagittarii	4.9	0.03	6.9	25 24.4	15 21.2	− 6 27.8	−0.5496	0.5833	0.1125	− 4	−82
χ Sagittarii	4.9	+0.01	7.0	24 40.6	19 13.6	− 2 44.5	−0.8410	0.5807	0.1232	−19	−90
51 Sagittarii	5.8	0.00	6.8	24 54.5	23 32.1	+ 1 23.9	−0.0486	0.5776	0.1347	+24	−47
h Sagittarii	4.7	−0.01	− 6.8	−25 4.4	23 48.2	+ 1 39.4	+0.1582	0.5774	+0.1354	+34	−35
53 Sagittarii	6.3	0.02	7.0	23 37.4	11 1 5.2	+ 2 53.4	−1.1536	0.5765	0.1387	−40	−90
274 B. Sagittarii	6.1	0.02	7.0	23 37.6	1 12.4	+ 3 0.3	−1.1348	0.5764	0.1390	−38	−90
308 B. Sagittarii	6.3	0.04	6.8	24 9.3	6 59.4	+ 8 34.0	+0.2539	0.5719	0.1535	+41	−30
329 B. Sagittarii	6.1	0.05	6.9	22 58.4	9 56.1	+11 24.1	−0.4989	0.5696	0.1605	+ 3	−76
336 B. Sagittarii	6.5	−0.06	− 6.9	−22 50.2	10 54.7	−11 39.5	−0.4822	0.5688	+0.1628	+ 5	−75
				NEW	*MOON.*						
13 Piscium	6.4	−0.09	− 1.5	− 1 33.3	15 14 42.1	−11 4.6	+0.5914	0.5014	+0.2665	+80	−14
14 Piscium	5.9	0.09	1.5	− 1 43.0	15 52.1	− 9 56.6	+1.0761	0.5011	0.2663	+88	+14
λ Piscium	4.6	−0.10	− 0.8	+ 1 18.7	20 7.2	− 5 48.7	−1.0449	0.5000	+0.2658	−13	−89
21 Piscium	5.6	0.07	0.5	0 36.2	16 0 6.1	− 1 56.6	+0.7734	0.4991	0.2650	+90	− 4
22 Piscium	5.8	0.08	0.1	2 27.5	1 27.2	− 0 37.8	−0.8649	0.4988	0.2647	− 1	−88
25 Piscium	6.2	−0.07	− 0.2	1 37.1	2 3.2	− 0 2.8	+0.1988	0.4987	0.2646	+55	−33
51 Piscium	5.6	+0.02	+ 2.3	6 29.2	23 21.2	− 3 20.6	+0.4821	0.4968	0.2553	+72	−18
136 B. Piscium	6.5	+0.03	+ 3.2	+ 8 53.5	17 4 7.5	+ 1 17.8	−0.9237	0.4970	+0.2522	− 5	−81
η Piscium	3.7	0.20	6.5	14 54.6	18 7 5.3	+ 3 29.9	−1.0079	0.5015	0.2286	−12	−75
101 Piscium	6.2	0.23	6.5	14 13.7	9 22.0	+ 5 42.6	+0.2579	0.5022	0.2261	+58	−26
105 Piscium	6.1	0.24	7.1	15 58.6	11 24.7	+ 7 41.8	−1.2040	0.5028	0.2238	−27	−74
4 Arietis	5.8	0.28	7.6	16 32.1	15 52.7	−11 58.0	−0.8311	0.5042	0.2185	0	−73
ι Arietis	5.1	+0.32	+ 8.1	+17 24.3	20 39.7	− 7 19.3	−0.7595	0.5059	+0.2126	+ 3	−73
35 B. Arietis	6.4	0.35	8.4	17 50.9	23 57.6	− 4 7.3	−0.5532	0.5072	0.2083	+14	−66
47 B. Arietis	6.5	0.38	8.4	17 37.6	19 2 3.6	− 2 4.9	+0.1238	0.5080	0.2055	+51	−30
20 H¹. Arietis	6.4	0.39	8.2	16 49.7	2 53.7	− 1 16.2	+1.1767	0.5083	0.2043	+90	+31
15 Arietis	5.9	0.38	9.0	19 6.1	3 30.8	− 0 40.2	−1.2063	0.5086	0.2035	−29	−71
θ Arietis	5.6	+0.43	+ 9.2	+19 30.7	7 21.8	+ 3 3.9	−0.8856	0.5102	+0.1981	− 5	−70
26 Arietis	6.2	0.50	9.5	19 28.9	13 43.3	+ 9 14.0	+0.3767	0.5130	0.1886	+66	−15
ν Arietis	5.4	0.54	10.4	21 35.8	17 49.2	−10 47.6	−1.2029	0.5149	0.1822	−31	−68
μ Arietis	5.7	0.58	9.8	19 39.2	19 37.1	− 9 3.0	+1.2729	0.5158	0.1793	+85	+46
ε Arietis (*mean*)	4.6	0.68	10.5	21 0.2	20 3 57.6	− 0 57.9	+1.2166	0.5198	0.1653	+90	+41
64 Arietis	5.8	+0.84	+11.8	+24 25.6	16 6.6	+10 48.1	−0.6974	0.5260	+0.1430	+ 5	−65

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
Tauri	5.9	+0.92	+11.8	+24 11.0	20 20 57.5	− 8 30.3	+0.2426	0.5286	+0.1335	+58	−15
Tauri	6.1	0.96	12.1	25 3.5	23 56.8	− 5 36.8	−0.3364	0.5301	0.1274	+25	−44
Tauri	5.4	0.99	11.7	24 1.6	21 1 51.9	− 3 45.5	+1.0468	0.5311	0.1235	+90	+32
Tauri	3.8	0.99	11.6	23 51.0	1 54.1	− 3 43.3	+1.2460	0.5311	0.1234	+83	+50
Tauri	5.6	0.99	11.9	24 34.6	2 1.5	− 3 36.2	+0.4573	0.5312	0.1231	+74	− 3
Tauri	4.3	+0.99	+11.8	+24 12.3	2 3.1	− 3 34.7	+0.8721	0.5312	+0.1231	+90	+20
Tauri	4.1	0.99	11.7	24 6.4	2 20.7	− 3 17.6	+1.0173	0.5314	0.1225	+90	+29
Tauri	5.8	1.00	11.8	24 17.6	2 22.8	− 3 15.6	+0.8146	0.5314	0.1224	+90	+17
Tauri	6.5	1.00	11.8	24 16.0	2 26.8	− 3 11.7	+0.8520	0.5314	0.1223	+90	+19
Tauri	5.3	1.03	12.2	25 19.6	4 26.0	− 1 16.4	−0.0822	0.5325	0.1182	+39	−30
Tauri	5.6	+1.18	+12.3	+26 15.8	13 57.2	+ 7 55.9	−0.0895	0.5372	+0.0975	+39	−28
Tauri	5.0	1.25	12.5	27 9.1	18 18.5	−11 51.5	−0.6671	0.5393	0.0877	+ 6	−60
Aurigæ	6.0	1.50	12.1	27 45.6	22 8 56.8	+ 2 16.9	−0.3022	0.5456	0.0531	+27	−36
Aurigæ	6.5	1.58	11.7	27 34.9	14 13.6	+ 7 22.7	+0.1401	0.5476	0.0401	+52	−11
Aurigæ	6.0	1.62	11.6	27 55.6	16 29.2	+ 9 33.6	−0.1559	0.5484	0.0345	+35	−25
B. Tauri	6.4	+1.70	+11.2	+27 52.5	21 27.1	− 9 39.0	+0.0415	0.5500	+0.0219	+46	−14
Aurigæ	6.4	1.73	11.5	28 51.6	22 29.2	− 8 39.0	−1.0170	0.5503	0.0193	−19	−61
Tauri	1.8	1.75	11.2	28 32.4	23 46.3	− 7 24.6	−0.6430	0.5507	0.0160	+ 7	−55
B. Aurigæ	6.5	1.80	10.6	27 36.6	23 4 0.9	− 3 19.0	+0.4198	0.5518	0.0051	+71	+ 7
B. Aurigæ	5.7	1.80	10.3	26 52.5	4 33.7	− 2 47.4	+1.2273	0.5519	+0.0037	+80	+58
B. Tauri	5.6	+1.91	+10.0	+27 56.8	10 34.6	+ 3 0.7	+0.0301	0.5532	−0.0119	+46	−14
Tauri	4.6	1.92	9.9	27 35.8	11 36.7	+ 4 0.6	+0.3989	0.5534	0.0146	+70	+ 5
B. Aurigæ	6.4	1.96	10.1	28 56.0	12 59.7	+ 5 20.6	−1.0824	0.5537	0.0182	−25	−61
B. Tauri	6.1	1.97	9.5	27 34.3	14 57.3	+ 7 14.1	+0.3616	0.5540	0.0233	+67	+ 2
Aurigæ	5.1	2.20	7.9	28 5.5	24 5 47.2	− 2 27.7	−0.8356	0.5551	0.0620	− 5	−62
Aurigæ	5.8	+2.23	+ 7.7	+28 20.5	7 40.2	− 0 38.7	−1.2263	0.5551	−0.0669	−42	−62
Geminorum	6.2	2.29	5.9	26 11.7	16 4.3	+ 7 27.3	+0.4403	0.5547	0.0885	+72	0
Geminorum	6.3	2.30	5.8	26 1.9	16 21.7	+ 7 44.1	+0.5905	0.5547	0.0892	+86	+ 8
Geminorum	5.6	2.38	5.4	26 59.9	21 32.2	−11 16.5	−0.9452	0.5541	0.1023	−12	−63
Geminorum	6.1	2.36	4.6	25 2.1	23 0.8	− 9 50.9	+1.0116	0.5539	0.1060	+90	+32
B. Geminorum	6.5	+2.41	+ 4.9	+26 50.7	25 0 0.7	− 8 53.2	−1.0397	0.5538	−0.1084	−19	−63
Geminorum	5.1	2.40	4.0	25 13.0	2 51.0	− 6 8.9	+0.3910	0.5534	0.1155	+69	− 5
B. Geminorum	6.3	2.45	2.9	24 33.1	9 20.1	+ 0 6.4	+0.3006	0.5522	0.1312	+62	−11
B. Geminorum	6.0	2.46	2.8	24 25.0	9 45.5	+ 0 30.9	+0.3894	0.5521	0.1322	+68	− 7
Geminorum	3.7	2.48	2.5	24 36.2	12 4.1	+ 2 44.6	−0.1218	0.5516	0.1376	+37	−33
Geminorum	6.3	+2.47	+ 1.9	+23 21.2	13 54.1	+ 4 30.8	+0.9555	0.5512	−0.1419	+90	+24
B. Geminorum	6.4	2.53	1.1	23 49.1	19 24.6	+ 9 49.7	−0.3571	0.5498	0.1545	+24	−48
Cancri	6.2	2.53	0.6	22 52.7	21 46.6	−11 53.2	+0.2681	0.5492	0.1598	+60	−16
Cancri	5.5	2.51	0.2	21 49.8	22 26.4	−11 14.8	+1.2755	0.5491	0.1613	+81	+50
B. Cancri	6.4	2.57	+ 0.1	23 23.7	26 1 4.0	− 8 42.6	−0.8155	0.5483	0.1670	− 2	−67
B. Cancri	6.0	+2.54	− 0.8	+21 1.0	4 4.4	− 5 48.4	+1.1895	0.5474	−0.1735	+90	+38
Cancri	5.5	2.57	1.8	20 43.8	9 38.5	− 0 25.8	+0.4909	0.5458	0.1850	+76	− 7
Cancri	6.5	2.58	2.4	20 18.5	12 59.5	+ 2 48.2	+0.3037	0.5447	0.1917	+62	−17
Cancri	6.5	2.58	2.4	20 16.3	13 1.8	+ 2 50.5	+0.3345	0.5447	0.1918	+64	−16
B. Cancri	6.5	2.58	2.5	19 58.2	13 6.8	+ 2 55.3	+0.6354	0.5447	0.1920	+88	0
Cancri	6.3	+2.58	− 2.5	+19 50.7	13 9.2	+ 2 57.7	+0.7594	0.5447	−0.1921	+90	+ 6
B. Cancri	6.1	2.59	3.4	19 9.0	17 50.5	+ 7 29.3	+0.5676	0.5432	0.2011	+81	− 5
B. Cancri	6.4	2.58	6.0	15 43.9	27 7 54.0	− 2 55.5	+1.1314	0.5390	0.2256	+90	+26
B. Leonis	6.3	2.61	6.2	16 57.1	9 52.7	− 1 0.8	−0.5887	0.5384	0.2287	+13	−70
Leonis	6.2	2.58	7.1	14 45.5	14 42.7	+ 3 39.6	+0.5675	0.5370	0.2360	+80	− 9
Leonis	6.5	+2.58	− 7.3	+14 43.8	15 42.8	+ 4 37.8	+0.3589	0.5368	−0.2375	+65	−20
Leonis	5.6	2.58	7.7	14 24.5	18 23.1	+ 7 12.8	+0.0518	0.5360	0.2413	+46	−36
Leonis	5.0	2.57	8.8	12 50.9	28 1 12.7	−10 11.1	−0.0127	0.5344	0.2502	+43	−40
Leonis	4.6	2.53	9.6	10 24.7	5 48.5	− 5 44.2	+1.3348	0.5334	0.2556	+84	+42
Leonis	1.3	2.56	9.5	12 22.8	6 1.3	− 5 31.9	−0.7470	0.5334	0.2559	+ 5	−78
Leonis	5.9	+2.52	−10.7	+ 9 12.9	14 2.9	+ 2 14.1	+0.4198	0.5320	−0.2642	+68	−20

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limi- ing Pa- allels	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° ′	d h m	h m				°	
45 Leonis	5.8	+2.54	−10.8	+10 11.6	28 15 10.9	+ 3 19.9	−0.8842	0.5318	−0.2652	− 3	−8
ρ Leonis	3.8	2.53	11.1	9 44.5	17 38.7	+ 5 42.9	−1.0761	0.5314	0.2674	−15	−8
48 Leonis	5.2	2.49	11.3	7 23.3	18 36.7	+ 6 39.1	+1.0742	0.5314	0.2682	+90	−1
49 Leonis	5.7	+2.52	−11.3	+ 9 5.2	18 42.8	+ 6 45.0	−0.6913	0.5313	−0.2683	+ 8	−8

MARCH.

The Star's					At Conjunction in R. A.					Limi- ing Pa- allels	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N.	S.
		Δα	Δδ								
37 Sextantis	6.3	+2.49	−11.9	+ 6 49.1	1 0 0.2	+11 52.2	+0.1984	0.5308	−0.2724	+55	−3
56 Leonis	6.1	2.48	12.5	6 38.2	4 45.1	− 7 32.1	−0.9161	0.5305	0.2754	− 5	−8
d Leonis	5.0	2.44	12.7	4 4.2	6 55.9	− 5 25.5	+1.0960	0.5304	0.2767	+90	−1
75 Leonis	5.4	+2.41	−13.5	+ 2 28.5	14 56.1	+ 2 19.3	+0.4869	0.5305	−0.2802	+73	−1
76 Leonis	6.0	2.41	13.6	2 6.8	15 43.1	+ 3 4.8	+0.6344	0.5306	0.2805	+84	−1
79 Leonis	5.5	2.40	13.8	+ 1 52.2	18 9.9	+ 5 26.9	+0.1926	0.5307	0.2812	+54	−3
υ Leonis	4.5	2.37	14.2	− 0 21.5	2 0 19.5	+11 24.6	+0.7139	0.5314	0.2823	+90	−
9 B. Virginis	6.2	2.36	14.6	+ 0 9.0	6 4.4	− 7 1.7	−1.4228	0.5323	0.2825	−52	−7
78 B. Virginis	6.5	+2.27	−14.9	− 5 15.0	17 58.5	+ 4 29.2	+0.6753	0.5351	−0.2801	+84	−
χ Virginis	4.8	2.21	15.2	7 31.9	3 5 35.8	− 8 16.6	−0.2537	0.5392	0.2742	+20	−5
ψ Virginis	5.0	2.18	15.2	9 4.9	12 31.2	− 1 35.1	−0.5770	0.5421	0.2689	+12	−
49 Virginis	5.2	2.14	15.2	10 17.4	18 39.4	+ 4 20.6	−0.9957	0.5451	0.2631	−12	−
i Virginis	5.7	2.09	15.0	12 16.2	4 3 4.1	−11 32.2	−1.1828	0.5495	0.2535	−28	−
75 Virginis	5.6	+2.07	−14.4	−14 55.8	5 45.9	− 8 56.1	+0.8080	0.5511	−0.2500	+75	−
83 Virginis	5.6	2.04	14.3	15 45.4	10 51.2	− 4 1.4	+0.3829	0.5541	0.2427	+50	−2
85 Virginis	6.1	2.04	14.4	15 20.7	11 20.0	− 3 33.6	−0.1457	0.5543	0.2420	+30	−
43 H. Virginis	5.5	1.95	13.8	17 48.5	5 0 6.0	+ 8 44.7	−0.6310	0.5623	0.2205	+ 3	−
231 G. Virginis	6.4	1.95	13.6	18 11.7	0 47.7	+ 9 24.8	−0.3965	0.5627	0.2192	+15	−
236 G. Virginis	5.7	+1.94	−13.6	−18 19.6	1 27.6	+10 3.2	−0.4096	0.5632	−0.2179	+14	−
9 G. Libræ	6.5	1.90	13.0	20 4.2	8 12.7	− 7 26.7	−0.0851	0.5675	0.2045	+29	−4
17 G. Libræ	6.4	1.86	12.8	20 49.2	12 52.8	− 2 57.1	−0.2634	0.5705	0.1944	+19	−
18 G. Libræ	6.1	1.86	12.7	20 58.3	13 18.2	− 2 32.6	−0.1923	0.5708	0.1935	+22	−
43 B. Libræ	5.7	1.84	12.8	21 2.2	17 26.0	+ 1 25.8	−0.9076	0.5734	0.1841	−17	−
47 G. Libræ	6.1	+1.80	−12.2	−21 42.3	21 5.9	+ 4 57.2	−0.8944	0.5757	−0.1753	−17	−
64 G. Libræ	5.8	1.77	12.0	22 5.3	6 1 4.6	+ 8 46.7	−1.1871	0.5780	0.1654	−40	−
153 B. Libræ	6.3	1.72	11.1	24 12.3	7 41.9	− 8 51.5	−0.0955	0.5818	0.1482	+22	−4
42 Libræ	5.0	1.69	11.2	23 32.7	10 30.5	− 6 9.7	−1.1658	0.5833	0.1406	−41	−
b Scorpii	4.7	1.66	10.3	25 29.8	14 39.5	− 2 10.6	+0.2424	0.5853	0.1290	+30	−3
A Scorpii	4.6	+1.65	−10.4	−25 4.6	15 41.3	− 1 11.2	−0.3126	0.5858	−0.1261	+ 9	−
31 B. Scorpii	5.4	1.64	10.7	24 17.0	15 48.5	− 1 4.3	−1.1287	0.5859	0.1258	−30	−
3 Scorpii	5.9	1.65	10.4	24 59.7	16 5.7	− 0 47.9	−0.4460	0.5860	0.1250	+ 2	−7
4 Scorpii	5.7	1.65	10.0	26 1.1	16 24.6	− 0 29.7	+0.5482	0.5862	0.1240	+55	−1
40 B. Scorpii	5.4	1.63	10.5	24 35.4	17 37.2	+ 0 40.0	−1.0432	0.5867	0.1206	−33	−
π Scorpii	3.0	+1.64	−10.1	−25 52.4	17 42.5	+ 0 45.1	+0.2423	0.5867	−0.1203	+38	−3
48 B. Scorpii	4.9	1.62	10.1	25 37.9	19 27.1	+ 2 25.5	−0.2066	0.5875	0.1153	+14	−5
65 B. Scorpii	5.5	1.60	9.8	26 6.1	21 17.0	+ 4 10.9	+0.0623	0.5882	0.1099	+27	−4
85 B. Scorpii	6.0	1.57	10.0	25 15.9	23 54.0	+ 6 41.5	−1.0621	0.5892	0.1021	−30	−
σ Scorpii	3.1	1.55	9.8	25 23.6	7 2 18.7	+ 9 0.4	−1.1711	0.5900	0.0949	−46	−
α Scorpii	1.2	+1.52	− 9.3	−26 14.8	5 26.5	−11 59.5	−0.5889	0.5910	−0.0853	− 9	−
116 B. Scorpii	6.2	1.51	9.3	26 21.4	6 11.6	−11 16.3	−0.5418	0.5912	0.0830	− 7	−
τ Scorpii	2.9	1.51	8.6	28 2.6	7 53.0	− 9 39.0	+1.0315	0.5917	0.0778	+62	+20
134 B. Scorpii	6.4	1.47	8.6	27 18.0	11 5.5	− 6 34.4	+0.0448	0.5924	0.0678	+22	−41
135 B. Scorpii	6.0	1.47	8.2	28 21.3	11 20.8	− 6 19.7	+1.0971	0.5924	0.0670	+62	+20
95 G. Ophiuchi	6.1	+1.36	− 7.9	−27 39.6	21 44.7	+ 3 38.5	−0.1329	0.5936	−0.0341	+11	−5
43 Ophiuchi	5.4	1.31	7.5	28 3.8	8 1 52.8	+ 7 36.4	+0.1642	0.5935	−0.0209	+25	−34
163 G. Ophiuchi	6.3	1.23	7.1	27 50.8	9 26.5	− 9 8.6	−0.1234	0.5927	+0.0034	+ 8	−51
X Sagittarii (*var.*)	4.4	1.21	7.0	27 48.1	11 3.9	− 7 35.2	−0.1594	0.5924	0.0085	+ 7	−53
4 G. Sagittarii	6.2	1.20	7.3	26 56.9	11 25.3	− 7 14.7	−1.0275	0.5923	0.0097	−42	−90
10 G. Sagittarii	5.7	+1.17	− 6.7	−28 3.2	14 32.3	− 4 15.3	+0.1475	0.5916	+0.0196	+23	−35

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
Scorpii	5.8	+1.17	−6.4	−28 45.1	8 15 16.5	−3 33.0	+0.8762	0.5914	+0.0219	+61	+8
Sagittarii	4.7	1.13	6.2	28 28.1	18 53.1	−0 5.2	+0.6871	0.5903	0.0332	+59	−4
C. D.−28° 14268	6.4	1.11	6.0	28 55.3	20 22.1	+1 20.1	+1.2039	0.5898	0.0379	+61	+39
Sagittarii	6.3	1.09	6.1	28 19.1	22 27.7	+3 20.7	+0.6724	0.5890	0.0443	+58	−5
Sagittarii	6.0	1.09	5.9	28 41.0	22 27.9	+3 20.9	+1.0459	0.5890	0.0443	+61	+21
Sagittarii	4.7	+1.07	−6.5	−27 4.6	22 44.4	+3 36.6	−0.5877	0.5889	+0.0452	−12	−86
Sagittarii	6.1	1.07	5.9	28 28.3	9 0 14.4	+5 3.1	+0.9130	0.5883	0.0498	+62	+11
Sagittarii	6.2	1.03	6.4	26 41.3	2 29.1	+7 12.3	−0.7954	0.5874	0.0567	−23	−90
Sagittarii	6.3	1.03	6.3	26 48.6	2 37.7	+7 20.5	−0.6613	0.5873	0.0571	−16	−90
Sagittarii	6.5	1.02	6.4	26 38.3	2 57.5	+7 39.5	−0.8188	0.5871	0.0581	−24	−90
Sagittarii	3.3	+0.96	−5.8	−27 4.8	9 27.8	−10 5.8	+0.0756	0.5839	+0.0775	+25	−39
Sagittarii	2.1	0.91	5.7	26 24.3	13 15.6	−6 27.0	−0.3042	0.5817	0.0885	+6	−63
B. Sagittarii	5.9	0.84	5.4	26 3.1	20 25.5	+0 26.1	+0.0380	0.5772	0.1085	+26	−42
Sagittarii	4.9	0.82	5.5	25 24.3	21 21.8	+1 20.2	−0.5254	0.5766	0.1110	−3	−80
Sagittarii	4.9	0.78	5.5	24 40.6	10 1 18.8	+5 8.1	−0.8198	0.5738	0.1216	−18	−90
Sagittarii	5.8	+0.74	−5.1	−24 54.4	5 42.7	+9 21.9	−0.0218	0.5706	+0.1328	+25	−45
Sagittarii	4.7	0.74	5.1	25 4.4	5 59.2	+9 37.9	+0.1867	0.5704	0.1335	+36	−33
Sagittarii	6.3	0.71	5.4	23 37.4	7 17.8	+10 53.5	−1.1366	0.5694	0.1368	−38	−90
B. Sagittarii	6.1	0.71	5.4	23 37.6	7 25.1	+11 0.5	−1.1175	0.5693	0.1371	−36	−90
B. Sagittarii	6.3	0.66	4.9	24 9.3	13 19.6	−7 18.2	+0.2820	0.5648	0.1513	+43	−28
B. Sagittarii	6.1	+0.62	−5.0	−22 58.4	16 20.1	−4 24.4	−0.4781	0.5624	+0.1583	+5	−75
B. Sagittarii	6.5	0.61	5.0	22 50.2	17 20.0	−3 26.7	−0.4616	0.5616	0.1605	+6	−73
Capricorni	5.7	0.56	4.8	22 4.5	23 28.3	+2 28.4	−0.2273	0.5567	0.1738	+19	−57
B. Capricorni	6.2	0.52	4.3	22 40.5	11 4 28.9	+7 18.2	+1.2956	0.5526	0.1839	+67	+44
Capricorni	5.7	0.40	4.7	18 14.8	15 50.9	−5 43.4	−1.1181	0.5435	0.2045	−29	−90
Capricorni	6.2	+0.40	−4.3	−19 22.0	18 1.5	−3 37.2	+0.5028	0.5418	+0.2081	+62	−17
Capricorni	6.5	0.38	4.6	17 51.8	18 37.4	−3 2.5	−0.9461	0.5413	0.2090	−16	−90
Capricorni	4.2	0.37	4.5	17 34.4	20 57.8	−0 46.9	−0.7590	0.5395	0.2127	−4	−90
URANUS	6.0	. . .	. . .	17 18.1	23 7.0	+1 18.0	−0.5828	0.5358	0.2154	+6	−82
B. Capricorni	6.1	0.34	4.2	17 41.9	12 1 13.5	+3 20.3	+0.2929	0.5362	0.2190	+52	−28
Capricorni	5.4	+0.34	−3.9	−18 20.6	2 33.1	+4 37.3	+1.2622	0.5352	+0.2209	+72	+35
Capricorni	6.3	0.34	4.0	17 49.2	2 42.0	+4 45.9	+0.7463	0.5351	0.2211	+72	−3
Capricorni	4.3	0.32	4.1	17 11.9	4 35.1	+6 35.4	+0.5123	0.5336	0.2237	+65	−17
Capricorni	5.1	0.24	4.0	14 25.7	13 51.5	−8 26.1	−0.2736	0.5270	0.2353	+25	−59
Capricorni	6.0	0.24	3.9	14 47.4	14 35.4	−7 43.6	+0.2802	0.5265	0.2361	+54	−29
Capricorni	5.8	+0.25	−3.8	−15 8.4	15 2.7	−7 17.2	+0.7579	0.5262	+0.2366	+75	−4
B. Capricorni	6.1	0.22	3.9	13 7.2	17 49.8	−4 35.4	−0.7112	0.5244	0.2396	+2	−90
Capricorni	5.2	0.22	−3.7	13 57.2	19 34.8	−2 53.7	+0.5897	0.5232	0.2414	+73	−13
MERCURY	0.7	. . .	. . .	−12 53.8	20 35.9	−1 54.4	−0.2820	0.4962	0.2427	+26	−60
				NEW	*MOON.*						
Piscium	3.7	0.00	+4.7	+14 54.6	17 15 6.0	−10 41.6	−1.0811	0.5042	+0.2291	−17	−75
Piscium	6.2	+0.02	4.8	14 13.7	17 22.1	−8 29.4	+0.1837	0.5049	0.2266	+54	−30
Piscium	6.1	0.02	5.2	15 58.6	19 24.2	−6 30.9	−1.2798	0.5055	0.2243	−35	−74
Arietis	5.8	0.04	5.6	16 32.1	23 50.9	−2 12.0	−0.9095	0.5070	0.2191	−6	−73
Arietis	5.1	+0.06	+6.1	+17 24.3	18 4 36.5	+2 25.3	−0.8409	0.5087	+0.2131	−2	−73
B. Arietis	6.4	0.08	6.4	17 50.8	7 53.5	+5 36.5	−0.6365	0.5099	0.2088	+10	−71
B. Arietis	6.5	0.10	6.4	17 37.6	9 58.8	+7 38.0	+0.0394	0.5107	0.2059	+46	−34
H¹. Arietis	6.4	0.11	6.3	16 49.7	10 48.7	+8 26.5	+1.0920	0.5110	0.2048	+90	+24
Arietis	5.9	0.10	6.8	19 6.1	11 25.7	+9 2.4	−1.2919	0.5112	0.2039	−39	−71
Arietis	5.6	+0.13	+7.2	+19 30.6	15 15.5	−11 14.7	−0.9733	0.5128	+0.1985	−11	−70
Arietis	6.2	0.18	7.6	19 28.8	21 35.5	−5 6.2	+0.2860	0.5154	0.1889	+60	−19
Arietis	5.4	0.20	8.4	21 35.8	19 1 40.5	−1 8.6	−1.2965	0.5172	0.1825	−43	−68
Arietis	5.7	0.24	8.0	19 39.1	3 28.1	+0 35.7	+1.1798	0.5180	0.1795	+90	+36
Arietis (*mean*)	4.6	0.31	8.7	21 0.2	11 47.3	+8 39.4	+1.1200	0.5217	0.1653	+90	+32
Arietis	5.8	+0.43	+10.1	+24 25.6	23 55.5	−3 35.3	−0.8012	0.5272	+0.1428	−2	−66

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's							At Conjunction in R. A.						Limiting Parallels	
Name.			Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.		Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
				Δα	Δδ									
				s	″	° ′	d	h m	h m				°	°
7		Tauri	5.9	+0.49	+10.1	+24 11.0	20	4 46.5	+ 1 6.5	+0.1385	0.5295	+0.1333	+52	−2
11		Tauri	6.1	0.52	10.5	25 3.5		7 46.0	+ 4 0.2	−0.4427	0.5308	0.1272	+19	−3
16		Tauri	5.4	0.55	10.2	24 1.5		9 41.3	+ 5 51.7	+0.9429	0.5316	0.1232	+90	+2
17		Tauri	3.8	0.55	10.1	23 51.0		9 43.5	+ 5 53.9	+1.1425	0.5317	0.1231	+90	+4
18		Tauri	5.6	0.55	10.4	24 34.6		9 50.9	+ 6 1.0	+0.3521	0.5317	0.1229	+66	−
q		Tauri	4.3	+0.56	+10.2	+24 12.3		9 52.5	+ 6 2.5	+0.7678	0.5317	+0.1228	+90	+1
20		Tauri	4.1	0.56	10.2	24 6.3		10 10.2	+ 6 19.7	+0.9131	0.5318	0.1222	+90	+2
21		Tauri	5.8	0.56	10.3	24 17.6		10 12.3	+ 6 21.8	+0.7100	0.5319	0.1221	+90	+1
22		Tauri	6.5	0.56	10.3	24 16.0		10 16.3	+ 6 25.6	+0.7475	0.5319	0.1220	+90	+1
η		Tauri	3.0	0.57	10.2	23 50.8		10 57.3	+ 7 5.3	+1.2966	0.5322	0.1206	+70	+5
14	H.	Tauri	5.3	+0.58	+10.6	+25 19.6		12 15.8	+ 8 21.2	−0.1895	0.5328	+0.1178	+33	−3
p		Tauri	5.6	0.72	11.0	26 15.8		21 49.0	− 6 24.5	−0.1996	0.5368	0.0971	+32	−3
φ		Tauri	5.0	0.78	11.3	27 9.1	21	2 11.6	− 2 10.6	−0.7801	0.5385	0.0873	− 1	−6
χ		Tauri	5.3	0.80	10.8	25 26.0		3 14.7	− 1 9.7	+1.2144	0.5389	0.0849	+85	−3
17	B.	Aurigæ	6.0	1.01	11.3	27 45.6		16 56.4	−11 55.8	−0.4174	0.5436	0.0527	+20	−4
38	B.	Aurigæ	6.5	+1.09	+11.0	+27 34.9		22 16.3	− 6 46.8	+0.0261	0.5451	+0.0397	+45	−1
47	B.	Aurigæ	6.0	1.13	11.1	27 55.6	22	0 33.4	− 4 34.4	−0.2716	0.5457	0.0341	+28	−3
354	B.	Tauri	6.4	1.20	10.9	27 52.5		5 34.8	+ 0 16.5	−0.0737	0.5468	0.0217	+39	−2
22		Aurigæ	6.4	1.23	11.2	28 51.6		6 37.6	+ 1 17.2	−1.1380	0.5470	0.0190	−31	−61
β		Tauri	1.8	1.25	11.0	28 32.4		7 55.7	+ 2 32.6	−0.7622	0.5473	0.0158	− 1	−61
107	B.	Aurigæ	6.5	+1.31	+10.4	+27 36.6		12 13.7	+ 6 41.6	+0.3063	0.5480	+0.0050	+63	+ 1
112	B.	Aurigæ	5.7	1.31	10.1	26 52.5		12 46.9	+ 7 13.6	+1.1185	0.5481	+0.0036	+90	+4
406	B.	Tauri	5.6	1.42	10.1	27 56.8		18 53.0	−10 53.0	−0.0859	0.5490	−0.0118	+39	−21
136		Tauri	4.6	1.43	9.9	27 35.8		19 56.0	− 9 52.2	+0.2853	0.5491	0.0145	+62	− 1
154	B.	Aurigæ	6.4	1.47	10.3	28 56.0		21 20.3	− 8 30.9	−1.2054	0.5492	0.0181	−40	−6
415	B.	Tauri	6.1	+1.49	+ 9.7	+27 34.3		23 19.8	− 6 35.6	+0.2478	0.5494	−0.0231	+59	− 4
49		Aurigæ	5.1	1.73	8.5	28 5.5	23	14 24.9	+ 7 57.8	−0.9566	0.5496	0.0613	−14	−6
37		Geminorum	5.7	1.83	6.6	25 29.1		23 21.4	− 7 24.5	+1.2338	0.5489	0.0835	+82	−5
39		Geminorum	6.2	1.86	6.7	26 11.7	24	0 53.5	− 5 55.6	+0.3301	0.5487	0.0873	+64	− 3
40		Geminorum	6.3	1.86	6.6	26 1.9		1 11.2	− 5 38.4	+0.4814	0.5487	0.0880	+76	+ 2
47		Geminorum	5.6	+1.96	+ 6.3	+26 59.9		6 27.8	− 0 32.8	−1.0645	0.5480	−0.1009	−22	−6
52		Geminorum	6.1	1.95	5.5	25 2.1		7 58.1	+ 0 54.3	+0.9072	0.5478	0.1045	+90	−2
134	B.	Geminorum	6.5	1.99	6.0	26 50.7		8 59.2	+ 1 53.3	−1.1591	0.5477	0.1069	−31	−6
A		Geminorum	5.1	2.00	5.1	25 13.0		11 52.9	+ 4 41.0	+0.2830	0.5471	0.1138	+61	−1
176	B.	Geminorum	6.3	2.08	4.0	24 33.1		18 29.7	+11 4.0	+0.1939	0.5458	0.1293	+55	−1
181	B.	Geminorum	6.0	+2.08	+ 3.9	+24 25.0		18 55.7	+11 29.1	+0.2836	0.5457	−0.1303	+61	−2
κ		Geminorum	3.7	2.12	3.7	24 36.2		21 17.0	−10 14.5	−0.2304	0.5453	0.1356	+31	−3
82		Geminorum	6.3	2.12	3.0	23 21.2		23 9.2	− 8 26.1	+0.8554	0.5448	0.1399	+90	+1
5	B.	Cancri	6.4	2.20	2.4	23 49.1	25	4 46.2	− 3 0.7	−0.4644	0.5435	0.1523	+18	−5
9		Cancri	6.2	2.21	1.8	22 52.8		7 10.8	− 0 41.0	+0.1663	0.5430	0.1575	+53	−21
μ		Cancri	5.5	+2.19	+ 1.3	+21 49.8		7 51.4	− 0 1.8	+1.1810	0.5428	−0.1589	+90	+30
35	B.	Cancri	6.4	2.26	1.5	23 23.7		10 32.0	+ 2 33.2	−0.9232	0.5421	0.1646	− 9	−67
49	B.	Cancri	6.0	2.24	+ 0.2	21 1.0		13 35.9	+ 5 31.0	+1.0970	0.5413	0.1710	+90	+31
η		Cancri	5.5	2.30	− 0.6	20 43.8		19 16.0	+10 59.7	+0.3968	0.5399	0.1824	+68	−12
39		Cancri	6.5	2.32	1.3	20 18.5		22 40.5	− 9 42.8	+0.2105	0.5390	0.1890	+56	−22
40		Cancri	6.5	+2.32	− 1.3	+20 16.3		22 42.9	− 9 40.4	+0.2415	0.5390	−0.1891	+58	−20
102	B.	Cancri	6.5	2.32	1.4	19 58.3		22 48.0	− 9 35.5	+0.5443	0.5390	0.1893	+70	− 5
ε		Cancri	6.3	2.32	1.4	19 50.7		22 50.4	− 9 33.1	+0.6690	0.5390	0.1894	+90	+ 1
139	B.	Cancri	6.1	2.35	2.3	19 9.0	26	3 36.5	− 4 56.7	+0.4790	0.5378	0.1983	+74	−10
227	B.	Cancri	6.4	2.41	5.3	15 43.7		17 52.4	+ 8 50.9	+1.0557	0.5346	0.2228	+90	+21
12	B.	Leonis	6.3	+2.45	− 5.2	+16 57.1		19 52.6	+10 47.2	−0.6698	0.5342	−0.2260	+ 8	−73
7		Leonis	6.2	2.45	6.5	14 45.5	27	0 46.0	− 8 29.0	+0.4952	0.5322	0.2334	+74	−13
11		Leonis	6.5	2.45	6.6	14 43.8		1 46.7	− 7 30.2	+0.2868	0.5330	0.2348	+60	−24
ψ		Leonis	5.6	2.47	7.1	14 24.5		4 28.7	− 4 53.5	−0.0187	0.5326	0.2387	+43	−39
ν		Leonis	5.0	2.49	8.4	12 50.9		11 21.8	+ 1 46.2	−0.0762	0.5317	0.2478	+40	−44
A		Leonis	4.6	+2.47	− 9.5	+10 24.7		15 59.4	+ 6 14.8	+1.2783	0.5312	−0.2534	+90	+36

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
Leonis	1.3	+2.51	− 9.1	+12 22.8	27 16 12.3	+ 6 27.3	−0.8060	0.5312	−0.2536	+ 1	−78
Leonis	5.9	2.50	10.8	9 12.9	28 0 15.8	− 9 44.9	+0.3712	0.5307	0.2623	+65	−23
Leonis	5.8	2.53	10.7	10 11.6	1 24.0	− 8 38.9	−0.9312	0.5306	0.2634	− 6	−80
Leonis	3.8	2.53	11.1	9 44.5	3 52.0	− 6 15.7	−1.1194	0.5306	0.2657	−19	−80
Leonis	5.2	2.50	11.7	7 23.3	4 50.1	− 5 19.4	+1.0306	0.5306	0.2666	+90	+13
Leonis	5.7	+2.52	−11.4	+ 9 5.2	4 56.1	− 5 13.6	−0.7335	0.5307	−0.2667	+ 6	−80
Sextantis	6.3	2.52	12.4	6 49.1	10 13.4	− 0 6.5	+0.1623	0.5307	0.2710	+52	−34
Leonis	6.1	2.54	13.0	6 38.1	14 57.6	+ 4 28.5	−0.9433	0.5311	0.2744	− 6	−83
Leonis	5.0	2.51	13.6	4 4.2	17 7.9	+ 6 34.6	+1.0664	0.5313	0.2757	+90	+14
Leonis	5.4	2.52	14.6	2 28.4	29 1 5.1	− 9 43.6	+0.4697	0.5325	0.2798	+72	−19
Leonis	6.0	+2.52	−14.7	+ 2 6.8	1 51.7	− 8 58.5	+0.6176	0.5326	−0.2801	+83	−12
Leonis	5.5	2.53	15.0	+ 1 52.2	4 17.2	− 6 37.7	+0.1812	0.5331	0.2810	+54	−34
Leonis	4.5	2.52	15.7	− 0 21.5	10 23.0	− 0 43.8	+0.7081	0.5345	0.2825	+88	− 7
B. Virginis	6.2	2.54	16.1	+ 0 9.0	16 3.4	+ 4 45.4	−1.4060	0.5362	0.2831	−48	−76
B. Virginis	6.5	2.53	17.2	− 5 15.1	30 3 45.7	− 7 55.6	+0.6939	0.5406	0.2815	+85	− 8
Virginis	4.8	+2.54	−17.9	− 7 32.0	15 8.4	+ 3 4.0	−0.2092	0.5460	−0.2761	+31	−55
Virginis	5.0	2.54	18.1	9 5.0	21 53.8	+ 9 35.4	−0.5185	0.5497	0.2712	+15	−75
Virginis	5.2	2.54	18.2	10 17.5	31 3 52.3	− 8 38.6	−0.9229	0.5533	0.2656	− 8	−90
Virginis	5.7	2.54	18.2	12 16.2	12 2.9	− 0 45.4	−1.0952	0.5586	0.2562	−21	−90
Virginis	5.6	2.54	18.0	14 55.9	14 39.9	+ 1 45.9	+0.8722	0.5603	0.2527	+75	+ 3
Virginis	5.6	+2.54	−17.8	−15 45.4	19 36.0	+ 6 31.2	+0.4592	0.5637	−0.2456	+63	−20
Virginis	6.1	+2.54	−17.9	−15 20.7	20 3.9	+ 6 58.2	−0.0613	0.5640	−0.2448	+35	−47

APRIL.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
H. Virginis	5.5	+2.53	−17.3	−17 48.6	1 8 25.6	− 5 7.9	−0.5240	0.5727	−0.2233	+ 8	−77
G. Virginis	6.4	2.53	17.2	18 11.7	9 6.0	− 4 29.0	−0.2922	0.5732	0.2220	+20	−61
G. Virginis	5.7	2.53	17.2	18 19.6	9 44.6	− 3 51.9	−0.3043	0.5737	0.2207	+19	−61
G. Libræ	6.5	2.53	16.6	20 4.3	16 16.4	+ 2 24.9	+0.0226	0.5783	0.2071	+34	−42
G. Libræ	6.4	2.53	16.2	20 49.2	20 47.2	+ 6 45.1	−0.1483	0.5813	0.1969	+25	−52
G. Libræ	6.1	+2.53	−16.2	−20 58.4	21 11.9	+ 7 8.9	−0.0779	0.5816	−0.1960	+28	−48
B. Libræ	5.7	2.54	16.4	21 2.3	2 1 11.5	+10 59.0	−0.7781	0.5843	0.1864	−10	−90
G. Libræ	6.1	2.51	15.5	21 42.4	4 44.0	− 9 37.0	−0.7617	0.5866	0.1776	−10	−90
G. Libræ	5.8	2.50	15.2	22 5.4	8 35.0	− 5 55.3	−1.0464	0.5889	0.1675	−29	−90
B. Libræ	6.3	2.49	14.2	24 12.3	14 59.3	+ 0 13.4	+0.0337	0.5925	0.1500	+29	−42
Libræ	5.0	+2.47	−14.1	−23 32.8	17 42.5	+ 2 49.9	−1.0181	0.5939	−0.1422	−29	−90
Scorpii	4.7	2.47	13.2	25 29.8	21 43.8	+ 6 41.3	+0.3718	0.5957	0.1305	+45	−23
Scorpii	4.6	2.46	13.2	25 4.7	22 43.6	+ 7 38.6	−0.1742	0.5962	0.1275	+16	−54
B. Scorpii	5.4	2.45	13.4	24 17.1	22 50.6	+ 7 45.3	−0.9780	0.5962	0.1271	−28	−90
Scorpii	5.9	2.46	13.2	24 59.8	23 7.3	+ 8 1.3	−0.3054	0.5963	0.1263	+10	−62
Scorpii	5.7	+2.47	−12.9	−26 1.2	23 25.6	+ 8 18.8	+0.6743	0.5964	−0.1254	+62	− 6
B. Scorpii	5.4	2.45	13.1	24 35.4	3 0 36.0	+ 9 26.4	−0.8927	0.5970	0.1218	−23	−90
Scorpii	3.0	2.46	12.8	25 52.4	0 41.1	+ 9 31.3	+0.3738	0.5970	0.1216	+45	−23
B. Scorpii	4.9	2.45	12.7	25 38.0	2 22.5	+11 8.5	−0.0672	0.5977	0.1165	+21	−47
B. Scorpii	6.4	2.43	13.0	24 29.8	2 36.0	+11 21.4	−1.2248	0.5977	0.1158	−50	−84
B. Scorpii	5.5	+2.44	−12.3	−26 6.2	4 9.1	−11 9.4	+0.1989	0.5982	−0.1110	+34	−32
B. Scorpii	6.0	2.42	12.3	25 15.9	6 41.4	− 8 43.5	−0.9077	0.5991	0.1031	−25	−90
Scorpii	3.1	2.40	12.0	25 23.6	9 2.0	− 6 28.8	−1.0138	0.5997	0.0957	−33	−90
Scorpii	1.2	2.39	11.4	26 14.8	12 4.4	− 3 34.0	−0.4381	0.6004	0.0860	− 1	−72
B. Scorpii	6.2	2.39	11.3	26 21.4	12 48.3	− 2 52.0	−0.3913	0.6006	0.0837	+ 1	−69
Scorpii	2.9	+2.40	−10.6	−28 2.6	14 26.8	− 1 17.6	+1.1613	0.6009	−0.0784	+62	+33
B. Scorpii	6.4	2.36	10.5	27 18.0	17 34.1	+ 1 41.7	+0.1900	0.6013	0.0683	+30	−33
B. Scorpii	6.0	2.38	10.1	28 21.3	17 49.0	+ 1 56.0	+1.2284	0.6013	0.0674	+62	+42
B. Ophiuchi	6.2	2.28	9.7	26 24.1	4 1 55.7	+ 9 42.0	−1.1681	0.6016	0.0408	−50	−90
G. Ophiuchi	6.1	2.28	9.0	27 39.6	3 57.3	+11 38.5	+0.0196	0.6014	0.0341	+18	−43
Oph. (*1st star*)	5.4	+2.24	− 9.6	−26 28.9	5 4.4	−11 17.3	−1.2009	0.6013	−0.0304	−54	−85

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
43 Ophiuchi	5.4	+2.25	−8.4	−28 3.8	4 7 59.7	− 8 29.3	+0.3149	0.6009	−0.0207	+33	−26
163 G. Ophiuchi	6.3	2.17	7.5	27 50.8	15 23.9	− 1 23.9	+0.0333	0.5991	+0.0037	+16	−42
X Sagittarii (*var.*)	4.4	2.15	7.3	27 48.1	16 59.3	+ 0 7.6	−0.0019	0.5985	0.0089	+15	−44
4 G. Sagittarii	6.2	2.13	7.6	26 56.9	17 20.3	+ 0 27.6	−0.8609	0.5984	0.0100	−31	−90
10 G. Sagittarii	5.7	2.12	6.8	28 3.2	20 23.9	+ 3 23.6	+0.3030	0.5973	0.0200	+32	−26
210 B. Scorpii	5.8	+2.12	−6.4	−28 45.1	21 7.3	+ 4 5.2	+1.0249	0.5970	+0.0223	+61	+20
38 B. Sagittarii	4.7	2.08	6.0	28 28.1	5 0 40.3	+ 7 29.4	+0.8390	0.5954	0.0337	+62	+ 6
48 G. Sagittarii	6.3	2.04	5.7	28 19.1	4 11.5	+10 51.9	+0.8256	0.5936	0.0448	+62	+ 5
62 B. Sagittarii	6.0	2.04	5.5	28 41.0	4 11.7	+10 52.0	+1.1960	0.5936	0.0448	+61	−35
66 B. Sagittarii	4.7	2.01	6.0	27 4.5	4 27.9	+11 7.5	−0.4236	0.5935	0.0456	− 4	−71
58 G. Sagittarii	6.1	+2.02	−5.4	−28 28.3	5 56.7	−11 27.3	+1.0648	0.5927	+0.0503	+62	+23
68 G. Sagittarii	6.2	1.96	5.7	26 41.3	8 9.5	− 9 20.0	−0.6293	0.5914	0.0571	−14	−90
69 G. Sagittarii	6.3	1.96	5.6	26 48.6	8 18.0	− 9 11.7	−0.4962	0.5913	0.0575	− 6	−77
86 B. Sagittarii	6.5	1.95	5.6	26 38.3	8 37.5	− 8 53.1	−0.6524	0.5910	0.0585	−15	−90
φ Sagittarii	3.3	1.89	4.6	27 4.8	15 3.1	− 2 43.1	+0.2359	0.5870	0.0778	+33	−30
σ Sagittarii	2.1	+1.83	−4.4	−26 24.3	18 48.6	+ 0 53.4	−0.1411	0.5843	+0.0888	+15	−52
201 B. Sagittarii	5.9	1.74	3.6	26 3.1	6 1 55.1	+ 7 43.0	+0.1991	0.5789	0.1086	+34	−32
ψ Sagittarii	4.9	1.72	3.8	25 24.3	2 51.1	+ 8 36.8	−0.3614	0.5781	0.1111	+ 6	−66
χ Sagittarii	4.9	1.66	3.6	24 40.5	6 46.8	−11 36.6	−0.6550	0.5748	0.1215	− 9	−90
49 Sagittarii	5.5	1.64	3.7	24 7.8	6 52.8	−11 30.9	−1.2032	0.5747	0.1217	−46	−88
51 Sagittarii	5.8	+1.61	−3.0	−24 54.4	11 9.6	− 7 23.9	+0.1391	0.5711	+0.1326	+34	−36
h Sagittarii	4.7	1.61	2.9	25 4.4	11 26.0	− 7 8.1	+0.3469	0.5708	0.1333	+45	−24
53 Sagittarii	6.3	1.57	3.2	23 37.4	12 44.5	− 5 52.5	−0.9722	0.5697	0.1365	−26	−90
274 B. Sagittarii	6.1	1.57	3.2	23 37.5	12 51.7	− 5 45.6	−0.9531	0.5696	0.1368	−25	−90
308 B. Sagittarii	6.3	1.50	2.5	24 9.2	18 45.7	− 0 4.8	+0.4410	0.5644	0.1508	+52	−10
329 B. Sagittarii	6.1	+1.45	−2.4	−22 58.3	21 46.2	+ 2 49.0	−0.3183	0.5617	+0.1575	+13	−63
336 B. Sagittarii	6.5	1.44	2.4	22 50.1	22 46.2	+ 3 46.8	−0.3022	0.5608	0.1597	+14	−62
4 Capricorni	5.7	1.36	2.0	22 4.4	7 4 55.1	+ 9 42.4	−0.0706	0.5552	0.1727	+27	−48
19 Capricorni	5.7	1.13	1.6	18 14.8	21 22.8	+ 1 35.9	−0.9711	0.5407	0.2026	−17	−90
20 Capricorni	6.2	1.12	1.0	19 21.9	23 34.5	+ 3 43.2	+0.6506	0.5388	0.2061	+69	− 9
21 Capricorni	6.5	+1.09	−1.4	−17 51.8	8 0 10.6	+ 4 18.0	−0.8010	0.5383	+0.2070	− 7	−90
θ Capricorni	4.2	1.07	1.3	17 34.3	2 32.1	+ 6 34.8	−0.6154	0.5363	0.2105	+ 4	−85
114 B. Capricorni	6.1	1.02	0.9	17 41.8	6 50.2	+10 44.4	+0.4355	0.5328	0.2167	+60	−20
URANUS	6.0	. . .	. . .	16 58.8	6 51.7	+10 45.9	−0.3138	0.5314	0.2164	+20	−62
31 Capricorni	6.3	1.01	0.7	17 49.2	8 19.6	−11 49.0	+0.8888	0.5316	0.2187	+72	− 5
ι Capricorni	4.3	+0.98	−0.7	−17 11.8	10 13.8	− 9 58.5	+0.6527	0.5302	+0.2212	+72	− 9
42 Capricorni	5.1	0.86	0.8	14 25.6	19 36.2	− 0 54.0	−0.1440	0.5232	0.2324	+31	−51
44 Capricorni	6.0	0.86	0.6	14 47.3	20 20.6	− 0 11.1	+0.4110	0.5226	0.2332	+61	−22
45 Capricorni	5.8	0.86	0.4	15 8.4	20 48.3	+ 0 15.8	+0.8901	0.5223	0.2337	+75	+ 5
151 B. Capricorni	6.1	0.82	0.8	13 7.2	23 37.3	+ 2 59.6	−0.5875	0.5204	0.2366	+ 9	−82
μ Capricorni	5.2	+0.82	−0.4	−13 57.2	9 1 23.6	+ 4 42.5	+0.7166	0.5192	+0.2383	+76	− 6
e Aquarii	5.4	0.72	0.2	11 59.0	10 9.0	−10 48.0	+0.7474	0.5138	0.2458	+78	− 4
150 B. Aquarii	6.0	0.66	0.7	9 27.8	13 22.0	− 7 40.8	−1.1422	0.5119	0.2483	−23	−90
167 G. Aquarii	6.3	0.57	0.1	8 20.4	10 0 30.7	+ 3 8.3	+0.4613	0.5064	0.2550	+68	−20
67 Aquarii	6.4	0.55	0.1	7 24.5	3 4.8	+ 5 37.9	+0.1205	0.5053	0.2563	+49	−37
252 B. Aquarii	5.8	+0.49	−0.1	− 5 26.4	9 24.7	+11 46.8	−0.3605	0.5028	+0.2587	+24	−64
197 G. Aquarii	6.3	0.48	0.0	5 15.9	10 32.2	−11 7.6	−0.2590	0.5024	0.2591	+30	−58
263 B. Aquarii	6.1	0.46	+0.2	5 10.1	12 48.0	− 8 55.6	+0.2249	0.5017	0.2598	+55	−32
293 B. Aquarii	5.5	0.41	0.4	3 57.6	20 20.9	− 1 35.6	+0.8916	0.4995	0.2614	+86	+ 3
13 Piscium	6.4	0.34	0.7	1 33.3	11 5 14.0	+ 7 2.6	+0.6211	0.4976	0.2619	+83	−12
14 Piscium	5.9	+0.34	+0.8	− 1 43.0	6 25.2	+ 8 11.8	+1.1073	0.4974	+0.2619	+88	+17
λ Piscium	4.6	0.29	0.6	+ 1 18.7	10 44.4	−11 36.2	−1.0436	0.4968	0.2616	−13	−80
21 Piscium	5.6	0.28	1.0	0 36.3	14 46.7	− 7 40.7	+0.7802	0.4965	0.2611	+90	− 3
22 Piscium	5.8	0.26	0.8	2 27.5	16 8.9	− 6 20.7	−0.8752	0.4963	0.2609	− 2	−88
25 Piscium	6.2	+0.26	+1.0	+ 1 37.1	16 45.5	− 5 45.1	+0.1958	0.4962	+0.2608	+54	−33
				NEW	*MOON.*						

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
Arietis (*mean*)	4.6	+0.16	+7.2	+21 0.2	15 18 43.0	− 6 37.2	+0.9826	0.5236	+0.1644	+90	+23
Arietis	5.8	0.22	8.3	24 25.6	16 6 50.7	+ 5 7.5	−0.9587	0.5292	0.1419	−11	−66
Tauri	5.9	0.26	8.4	24 10.9	11 41.6	+ 9 49.1	−0.0233	0.5313	0.1323	+42	−28
Tauri	6.1	0.28	8.7	25 3.5	14 41.0	−11 17.3	−0.6095	0.5326	0.1262	+10	−60
Tauri	5.4	0.30	8.6	24 1.5	16 36.3	− 9 25.8	+0.7769	0.5334	0.1223	+90	+14
Tauri	3.8	+0.31	+8.5	+23 51.0	16 38.5	− 9 23.6	+0.9770	0.5334	+0.1222	+90	+27
Tauri	5.6	0.30	8.7	24 34.6	16 45.9	− 9 16.4	+0.1846	0.5335	0.1219	+55	−17
Tauri	4.3	0.31	8.6	24 12.2	16 47.6	− 9 14.7	+0.6012	0.5335	0.1219	+86	+ 5
Tauri	4.1	0.31	8.6	24 6.3	17 5.2	− 8 57.8	+0.7465	0.5336	0.1213	+90	+13
Tauri	5.8	0.31	8.6	24 17.5	17 7.3	− 8 55.7	+0.5430	0.5336	0.1212	+81	+ 2
Tauri	6.5	+0.31	+8.6	+24 16.0	17 11.3	− 8 51.9	+0.5804	0.5337	+0.1210	+84	+ 4
Tauri	4.3	0.31	8.5	23 41.2	17 19.7	− 8 43.8	+1.2411	0.5337	0.1208	+84	+50
Tauri	3.0	0.32	8.6	23 50.7	17 52.3	− 8 12.2	+1.1299	0.5340	0.1196	+90	+39
Tauri	3.7	0.32	8.6	23 47.8	18 39.8	− 7 26.2	+1.2781	0.5343	0.1180	+76	+56
Tauri	5.2	0.32	8.6	23 52.8	18 40.4	− 7 25.6	+1.1865	0.5343	0.1180	+90	+44
H. Tauri	5.3	+0.32	+8.8	+25 19.6	19 10.8	− 6 56.2	−0.3610	0.5345	+0.1169	+23	−45
Tauri	5.6	0.41	9.3	26 15.8	17 4 44.6	+ 2 18.7	−0.3820	0.5382	0.0962	+22	−44
Tauri	5.0	0.46	9.6	27 9.1	9 7.6	+ 6 33.0	−0.9689	0.5397	0.0863	−15	−63
Tauri	5.3	0.47	9.2	25 25.9	10 10.8	+ 7 34.1	+1.0303	0.5401	0.0839	+90	+35
B. Aurigæ	6.0	0.63	9.9	27 45.5	23 55.3	− 3 9.3	−0.6198	0.5440	0.0517	+ 8	−56
B. Aurigæ	6.5	+0.70	+9.8	+27 34.9	18 5 16.8	+ 2 1.3	−0.1794	0.5452	+0.0388	+33	−27
B. Aurigæ	6.0	0.72	9.8	27 55.6	7 34.7	+ 4 14.4	−0.4803	0.5456	0.0332	+16	−45
B. Tauri	6.4	0.79	9.8	27 52.5	12 38.2	+ 9 7.5	−0.2856	0.5464	0.0208	+27	−32
Tauri	1.8	0.83	9.8	28 32.4	15 0.1	+11 24.6	−0.9793	0.5467	0.0150	−16	−61
B. Aurigæ	6.5	0.88	9.4	27 36.6	19 20.2	− 8 24.3	+0.0913	0.5471	0.0042	+49	− 9
B. Aurigæ	5.7	+0.89	+9.2	+26 52.5	19 53.7	− 7 52.0	+0.9073	0.5471	+0.0028	+90	+34
B. Tauri	5.6	0.98	9.4	27 56.8	19 2 3.3	− 1 55.1	−0.3077	0.5475	−0.0125	+26	−32
Tauri	4.6	0.99	9.2	27 35.7	3 7.0	− 0 53.6	+0.0649	0.5475	0.0151	+47	−12
B. Tauri	6.1	1.04	9.0	27 34.3	6 33.0	+ 2 25.3	+0.0252	0.5475	0.0237	+45	−15
Aurigæ	5.1	1.26	8.3	28 5.5	21 50.2	− 6 49.2	−1.1963	0.5464	0.0614	−38	−62
Geminorum	5.7	+1.36	+6.8	+25 29.1	20 6 55.6	+ 1 57.4	+1.0077	0.5449	−0.0832	+90	+33
Geminorum	6.2	1.39	6.9	26 11.7	8 29.4	+ 3 28.0	+0.0959	0.5446	0.0869	+49	−17
Geminorum	6.3	1.39	6.8	26 1.9	8 47.4	+ 3 45.4	+0.2484	0.5445	0.0876	+59	−10
Geminorum	6.1	1.48	5.8	25 2.1	15 41.9	+10 25.8	+0.6762	0.5430	0.1037	+90	+11
Geminorum	5.1	1.53	5.6	25 13.0	19 41.4	− 9 42.9	+0.0456	0.5420	0.1129	+46	−22
B. Geminorum	6.3	+1.62	+4.6	+24 33.2	21 2 26.7	− 3 11.3	−0.0453	0.5403	−0.1279	+41	−29
B. Geminorum	6.0	1.62	4.6	24 25.0	2 53.2	− 2 45.7	+0.0453	0.5402	0.1289	+46	−24
B. Geminorum	6.3	1.61	4.1	23 13.0	3 43.3	− 1 57.3	+1.2402	0.5399	0.1307	+84	+49
Geminorum	3.7	1.65	4.4	24 36.2	5 17.7	− 0 26.0	−0.4742	0.5395	0.1341	+17	−53
Geminorum	6.3	1.66	3.8	23 21.2	7 12.4	+ 1 24.8	+0.6225	0.5389	0.1382	+88	+ 4
B. Cancri	6.4	+1.74	+3.3	+23 49.1	12 57.3	+ 6 58.1	−0.7107	0.5373	−0.1503	+ 4	−66
Cancri	6.2	1.76	2.7	22 52.8	15 25.5	+ 9 21.4	−0.0732	0.5366	0.1554	+39	−33
Cancri	5.5	1.75	2.2	21 49.8	16 7.1	+10 1.6	+0.9523	0.5363	0.1568	+90	+22
B. Cancri	6.4	1.81	2.5	23 23.7	18 51.6	−11 19.3	−1.1740	0.5355	0.1623	−30	−67
B. Cancri	6.0	1.82	1.3	21 1.0	22 0.1	− 8 17.0	+0.8687	0.5346	0.1685	+90	+15
Cancri	5.5	+1.88	+0.5	+20 43.8	22 3 48.9	− 2 39.6	+0.1623	0.5329	−0.1796	+53	−24
Cancri	6.5	1.92	0.0	20 18.5	7 18.8	+ 0 43.4	−0.0247	0.5319	0.1860	+42	−34
Cancri	6.5	1.92	0.0	20 16.3	7 21.3	+ 0 45.9	+0.0066	0.5319	0.1861	+44	−32
B. Cancri	6.5	1.91	−0.2	19 58.3	7 26.5	+ 0 50.9	+0.3128	0.5319	0.1862	+62	−17
Cancri	6.3	1.91	0.2	19 50.8	7 29.0	+ 0 53.3	+0.4390	0.5319	0.1863	+71	−11
B. Cancri	6.1	+1.96	−1.1	+19 9.0	12 22.6	+ 5 37.4	+0.2490	0.5305	−0.1950	+58	−21
B. Cancri	6.4	2.06	4.0	15 43.9	23 3 1.6	− 4 11.9	+0.8415	0.5270	0.2188	+90	+ 7
B. Leonis	6.3	2.10	3.8	16 57.1	5 5.0	− 2 12.5	−0.9018	0.5266	0.2219	− 6	−73
Leonis	6.2	2.12	5.2	14 45.5	10 6.3	+ 2 39.3	+0.2808	0.5258	0.2290	+59	−24
Leonis	6.5	2.13	5.3	14 43.8	11 8.6	+ 3 39.6	+0.0710	0.5256	0.2305	+47	−34
Leonis	5.6	+2.15	−5.7	+14 24.6	13 54.9	+ 6 20.7	−0.2350	0.5252	−0.2342	+31	−51

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
47 B. Arietis	6.5	+0.74	+10.2	+17 37.7	22 17 41.6	+11 45.3	+0.0639	0.5058	+0.2047	+48	−33
20 H^1. Arietis	6.4	0.76	10.0	16 49.7	18 32.1	−11 25.7	+1.1192	0.5062	0.2036	+90	+27
15 Arietis	5.9	0.75	10.8	19 6.2	19 9.4	−10 49.5	−1.2686	0.5065	0.2027	−36	−71
θ Arietis	5.6	0.80	11.0	19 30.7	23 1.8	− 7 3.9	−0.9464	0.5083	0.1975	− 9	−70
26 Arietis	6.2	0.88	11.2	19 28.9	23 5 25.2	− 0 52.0	+0.3194	0.5116	0.1882	+63	−18
ν Arietis	5.4	+0.94	+12.0	+21 35.9	9 32.1	+ 3 7.5	−1.2611	0.5138	+0.1820	−38	−68
μ Arietis	5.7	0.96	11.3	19 39.2	11 20.4	+ 4 52.5	+1.2176	0.5148	0.1792	+90	+39
ε Arietis (*mean*)	4.6	1.08	11.9	21 0.3	19 41.9	−11 1.5	+1.1626	0.5196	0.1654	+90	+36
64 Arietis	5.8	1.25	12.9	24 25.6	24 7 50.8	+ 0 44.5	−0.7480	0.5268	0.1434	+ 2	−65
7 Tauri	5.9	1.32	12.7	24 11.0	12 41.0	+ 5 25.4	+0.1928	0.5298	0.1340	+55	−18
11 Tauri	6.1	+1.37	+13.0	+25 3.5	15 39.7	+ 8 18.3	−0.3847	0.5315	+0.1280	+22	−47
16 Tauri	5.4	1.39	12.5	24 1.6	17 34.4	+10 9.2	+0.9975	0.5327	0.1241	+90	+28
17 Tauri	3.8	1.39	12.5	23 51.0	17 36.6	+10 11.4	+1.1965	0.5327	0.1240	+90	+45
18 Tauri	5.6	1.40	12.7	24 34.6	17 44.0	+10 18.5	+0.4088	0.5328	0.1238	+70	− 5
q Tauri	4.3	1.40	12.6	24 12.3	17 45.6	+10 20.0	+0.8231	0.5328	0.1237	+90	+17
20 Tauri	4.1	+1.40	+12.6	+24 6.4	18 3.2	+10 37.1	+0.9681	0.5330	+0.1231	+90	+26
21 Tauri	5.8	1.40	12.6	24 17.6	18 5.3	+10 39.1	+0.7658	0.5330	0.1231	+90	+14
22 Tauri	6.5	1.40	12.6	24 16.0	18 9.2	+10 42.9	+0.8031	0.5330	0.1229	+90	+16
14 H. Tauri	5.3	1.44	12.9	25 19.6	20 8.0	−11 22.2	−0.1294	0.5342	0.1188	+36	−32
p Tauri	5.6	1.58	12.8	26 15.8	25 5 36.2	− 2 12.9	−0.1336	0.5397	0.0983	+36	−31
φ Tauri	5.0	+1.65	+12.8	+27 9.1	9 55.7	+ 1 57.8	−0.7084	0.5421	+0.0885	+ 3	−63
χ Tauri	5.3	1.66	12.2	25 26.0	10 58.0	+ 2 58.1	+1.2757	0.5426	0.0861	+72	+59
17 B. Aurigæ	6.0	1.87	11.9	27 45.6	26 0 26.9	− 8 0.9	−0.3395	0.5493	0.0537	+24	−38
38 B. Aurigæ	6.5	1.94	11.4	27 34.9	5 40.8	− 2 58.0	+0.1033	0.5515	0.0406	+50	−13
47 B. Aurigæ	6.0	1.98	11.3	27 55.6	7 55.1	− 0 48.4	−0.1911	0.5524	0.0350	+33	−28
354 B. Tauri	6.4	+2.04	+10.8	+27 52.5	12 50.0	+ 3 56.0	+0.0074	0.5542	+0.0224	+44	−16
22 Aurigæ	6.4	2.08	10.9	28 51.6	13 51.4	+ 4 55.3	−1.0476	0.5545	0.0197	−22	−61
β Tauri	1.8	2.09	10.7	28 32.4	15 7.7	+ 6 8.8	−0.6744	0.5549	0.0164	+ 5	−57
107 B. Aurigæ	6.5	2.13	10.0	27 36.6	19 19.7	+10 11.9	+0.3865	0.5562	0.0055	+69	+ 5
112 B. Aurigæ	5.7	2.12	9.8	26 52.5	19 52.1	+10 43.1	+1.1917	0.5563	+0.0040	+86	+55
406 B. Tauri	5.6	+2.21	+ 9.3	+27 56.8	27 1 49.1	− 7 32.6	+0.0001	0.5577	−0.0117	+44	−15
136 Tauri	4.6	2.22	9.1	27 35.7	2 50.5	− 6 33.4	+0.3681	0.5579	0.0144	+68	+ 3
154 B. Aurigæ	6.4	2.26	9.2	28 55.9	4 12.7	− 5 14.2	−1.1082	0.5581	0.0181	−28	−61
415 B. Tauri	6.1	2.26	8.7	27 34.3	6 9.0	− 3 22.1	+0.3320	0.5584	0.0232	+65	+ 1
49 Aurigæ	5.1	2.42	6.8	28 5.5	20 49.5	+10 46.6	−0.8576	0.5594	0.0622	− 7	−63
54 Aurigæ	5.8	+2.44	+ 6.5	+28 20.5	22 41.4	−11 25.5	−1.2469	0.5594	−0.0671	−47	−6
39 Geminorum	6.2	2.46	4.9	26 11.7	28 7 0.7	− 3 24.3	+0.4182	0.5587	0.0889	+71	− 1
40 Geminorum	6.3	2.46	4.8	26 1.9	7 17.8	− 3 7.8	+0.5682	0.5586	0.0896	+84	+ 7
47 Geminorum	5.6	2.52	4.2	26 59.9	12 25.7	+ 1 49.0	−0.9634	0.5579	0.1027	−14	−63
52 Geminorum	6.1	2.49	3.7	25 2.1	13 53.6	+ 3 13.9	+0.9906	0.5576	0.1064	+90	+30
134 B. Geminorum	6.5	+2.54	+ 3.7	+26 50.7	14 53.0	+ 4 11.1	−1.0573	0.5574	−0.1089	−21	−63
A Geminorum	5.1	2.52	3.1	25 12.9	17 42.0	+ 6 54.1	+0.3721	0.5568	0.1159	+67	− 6
176 B. Geminorum	6.3	2.54	2.0	24 33.1	29 0 8.5	−10 53.1	+0.2835	0.5552	0.1316	+61	−12
181 B. Geminorum	6.0	2.54	1.9	24 25.0	0 33.9	−10 28.6	+0.3725	0.5551	0.1326	+67	− 8
κ Geimnorum	3.7	2.55	1.6	24 36.2	2 51.7	− 8 15.7	−0.1378	0.5544	0.1381	+36	−34
82 Geminorum	6.3	+2.53	+ 1.1	+23 21.2	4 41.1	− 6 30.1	+0.9396	0.5538	−0.1423	+90	+23
5 B. Cancri	6.4	2.56	+ 0.3	23 49.1	10 10.2	− 1 12.6	−0.3716	0.5520	0.1549	+23	−48
9 Cancri	6.2	2.55	− 0.2	22 52.7	12 31.7	+ 1 4.0	+0.2543	0.5512	0.1602	+59	−17
μ Cancri	5.5	2.52	0.4	21 49.7	13 11.4	+ 1 42.3	+1.2624	0.5510	0.1616	+83	+48
35 B. Cancri	6.4	2.57	0.7	23 23.6	15 48.6	+ 4 14.0	−0.8295	0.5500	0.1674	− 3	−67
49 B. Cancri	6.0	+2.52	− 1.3	+21 1.0	18 48.7	+ 7 7.9	+1.1785	0.5489	−0.1738	+90	+37
η Cancri	5.5	2.52	2.2	20 43.8	30 0 22.6	−11 29.7	+0.4803	0.5467	0.1851	+74	− 8
39 Cancri	6.5	2.52	2.7	20 18.5	3 43.8	− 8 15.5	+0.2935	0.5453	0.1917	+61	−18
40 Cancri	6.5	2.52	2.7	20 16.3	3 46.1	− 8 13.2	+0.3243	0.5453	0.1918	+63	−16
102 B. Cancri	6.5	2.51	2.7	19 58.2	3 51.1	− 8 8.4	+0.6260	0.5452	0.1920	+87	− 1
ε Cancri	6.3	+2.51	− 2.7	+19 50.7	3 53.5	− 8 6.1	+0.7502	0.5452	−0.1920	+90	+ 6

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JANUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
. Cancri	6.1	+2.49	− 3.5	+19 9.0	30 8 35.5	− 3 33.7	+0.5591	0.5433	−0.2009	+81	− 5
. Cancri	6.4	2.41	5.5	15 43.9	22 43.5	+10 6.0	+1.1288	0.5375	0.2249	+90	+26
. Leonis	6.3	2.43	5.8	16 57.1	31 0 43.1	−11 58.4	−0.5996	0.5367	0.2279	+12	−70
Leonis	6.2	2.38	6.4	14 45.5	5 35.8	− 7 15.3	+0.5633	0.5348	0.2349	+80	− 9
Leonis	6.5	2.38	6.6	14 43.8	6 36.4	− 6 16.6	+0.3537	0.5344	0.2363	+64	−20
Leonis	5.6	+2.37	− 6.9	+14 24.5	9 18.5	− 3 39.8	+0.0450	0.5334	−0.2400	+46	−36
Leonis	5.0	2.32	7.7	12 50.9	16 13.2	+ 3 1.5	−0.0194	0.5310	0.2485	+43	−41
Leonis	4.6	2.26	8.1	10 24.7	20 53.0	+ 7 32.3	+1.3389	0.5295	0.2537	+83	+43
Leonis	1.3	+2.29	− 8.3	+12 22.8	21 6.1	+ 7 45.0	−0.7593	0.5294	−0.2540	+ 4	−78
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Leonis	5.9	+2.20	− 8.9	+ 9 12.9	1 5 15.6	− 8 21.0	+0.4174	0.5272	−0.2618	+68	−20
Leonis	5.8	2.21	9.2	10 11.6	6 24.9	− 7 13.9	−0.8983	0.5269	0.2628	− 4	−80
Leonis	3.8	2.20	9.4	9 44.5	8 55.5	− 4 48.1	−1.0922	0.5264	0.2648	−16	−80
Leonis	5.2	+2.16	− 9.2	+ 7 23.3	9 54.6	− 3 50.9	+1.0782	0.5261	−0.2656	+90	+16
Leonis	5.7	2.18	9.4	9 5.2	10 0.8	− 3 44.9	−0.7040	0.5261	0.2656	+ 7	−80
Sextantis	6.3	2.12	9.8	6 49.1	15 24.6	+ 1 28.7	+0.1942	0.5251	0.2694	+54	−33
Leonis	6.1	2.09	10.1	6 38.2	20 15.8	+ 6 10.8	−0.9321	0.5244	0.2723	− 6	−83
Leonis	5.0	2.04	9.9	4 4.3	22 29.5	+ 8 20.3	+1.1012	0.5241	0.2734	+90	+17
Leonis	5.4	+1.97	−10.4	+ 2 28.5	2 6 41.3	− 7 43.3	+0.4855	0.5235	−0.2766	+73	−19
Leonis	6.0	1.96	10.4	2 6.8	7 29.4	− 6 56.8	+0.6347	0.5235	0.2768	+84	−11
Leonis	5.5	1.95	10.5	+ 1 52.3	9 59.9	− 4 31.0	+0.1876	0.5235	0.2774	+54	−34
Leonis	4.5	1.88	10.6	− 0 21.4	16 19.3	+ 1 36.6	+0.7147	0.5237	0.2784	+90	− 7
B. Virginis	6.5	1.71	10.6	5 15.0	3 10 28.2	− 4 48.8	+0.6737	0.5267	0.2759	+84	− 9
Virginis	4.8	+1.60	−10.7	− 7 31.9	22 26.0	+ 6 46.0	−0.2694	0.5305	−0.2700	+29	−59
Virginis	5.0	1.52	10.6	9 4.8	4 5 33.6	−10 20.4	−0.5980	0.5335	0.2648	+11	−82
Virginis	5.2	1.46	10.5	10 17.3	11 52.4	− 4 14.1	−1.0230	0.5365	0.2592	−14	−90
Virginis	5.7	1.38	10.3	12 16.1	20 31.3	+ 4 7.6	−1.2134	0.5413	0.2499	−30	−90
Virginis	5.6	1.34	9.5	14 55.7	23 17.4	+ 6 48.0	+0.8005	0.5428	0.2465	+75	− 1
Virginis	5.6	+1.30	− 9.4	−15 45.3	5 4 30.8	+11 50.7	+0.3692	0.5462	−0.2395	+58	−25
Virginis	6.1	1.29	9.5	15 20.6	5 0.3	−11 40.8	−0.1655	0.5465	0.2388	+29	−53
H. Virginis	5.5	1.15	9.1	17 48.4	18 4.8	+ 0 56.2	−0.6579	0.5554	0.2180	+ 1	−90
G. Virginis	6.4	1.14	9.0	18 11.6	18 47.5	+ 1 37.3	−0.4212	0.5559	0.2168	+14	−69
G. Virginis	5.7	1.14	9.0	18 19.5	19 28.3	+ 2 16.6	−0.4345	0.5564	0.2155	+13	−71
G. Libræ	6.5	+1.06	− 8.5	−20 4.2	6 2 21.9	+ 8 55.2	−0.1079	0.5614	−0.2025	+28	−50
G. Libræ	6.4	1.01	8.4	20 49.1	7 7.2	−10 30.0	−0.2885	0.5649	0.1927	+18	−61
G. Libræ	6.1	1.01	8.3	20 58.3	7 33.1	−10 5.1	−0.2160	0.5652	0.1918	+21	−57
B. Libræ	5.7	0.97	8.6	21 2.1	11 45.2	− 6 2.4	−0.9381	0.5683	0.1826	−19	−90
G. Libræ	6.1	0.92	8.2	21 42.2	15 28.5	− 2 27.6	−0.9249	0.5710	0.1741	−19	−90
G. Libræ	5.8	+0.87	− 8.2	−22 5.3	19 30.7	+ 1 25.4	−1.2195	0.5738	−0.1644	−44	−89
B. Libræ	6.3	0.80	7.5	24 12.2	7 2 12.7	+ 7 51.9	−0.1219	0.5784	0.1475	+21	−51
Libræ	5.0	0.77	7.8	23 32.7	5 3.0	+10 35.4	−1.1976	0.5803	0.1401	−44	−90
Scorpii	4.7	0.72	7.1	25 29.7	9 14.2	− 9 23.3	+0.2165	0.5830	0.1287	+37	−32
Scorpii	4.6	0.71	7.3	25 4.6	10 16.4	− 8 23.5	−0.3408	0.5836	0.1258	+ 8	−65
B. Scorpii	5.4	+0.71	− 7.6	−24 17.0	10 23.8	− 8 16.4	−1.1599	0.5836	−0.1254	−42	−90
Scorpii	5.9	0.71	7.3	24 59.7	10 41.0	− 7 59.9	−0.4748	0.5838	0.1247	+ 1	−75
Scorpii	5.7	0.70	7.0	26 1.1	11 0.1	− 7 41.6	+0.5231	0.5840	0.1237	+54	−15
B. Scorpii	5.4	0.69	7.5	24 35.3	12 13.2	− 6 31.4	−1.0740	0.5848	0.1203	−35	−90
Scorpii	3.0	0.69	7.0	25 52.3	12 18.5	− 6 26.3	+0.2159	0.5848	0.1201	+36	−32
B. Scorpii	4.9	+0.67	− 7.1	−25 37.9	14 3.7	− 4 45.3	−0.2347	0.5858	−0.1151	+12	−58
B. Scorpii	5.5	0.65	7.0	26 6.1	15 54.2	− 2 59.3	+0.0348	0.5868	0.1098	+25	−42
B. Scorpii	6.0	0.62	7.3	25 15.8	18 31.9	− 0 27.9	−1.0925	0.5882	0.1021	−38	−90
Scorpii	3.1	0.60	7.3	25 23.5	20 57.2	+ 1 51.5	−1.2015	0.5894	0.0949	−48	−87
Scorpii	1.2	0.56	7.0	26 14.8	8 0 5.3	+ 4 52.0	−0.6181	0.5908	0.0854	−10	−90
B. Scorpii	6.2	+0.56	− 7.0	−26 21.3	0 50.5	+ 5 35.3	−0.5710	0.5911	−0.0831	− 8	−84

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.						Limiting Parallels	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.		Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ									
		s	″	° ′	d	h m	h m				°	°
τ Scorpii	2.9	+0.54	− 6.4	−28 2.5	8	2 31.9	+ 7 12.6	+1.0037	0.5918	−0.0779	+62	+17
134 B. Scorpii	6.4	0.50	6.8	27 18.0		5 44.5	+10 17.3	+0.0159	0.5930	0.0680	+21	−43
135 B. Scorpii	6.0	0.50	6.4	28 21.2		5 59.7	+10 31.9	+1.0685	0.5931	0.0672	+62	+23
95 G. Ophiuchi	6.1	0.40	6.6	27 39.6		16 21.7	− 3 31.8	−0.1623	0.5957	0.0343	+ 9	−54
43 Ophiuchi	5.4	0.36	6.5	28 3.8		20 28.3	+ 0 24.6	+0.1341	0.5962	−0.0210	+23	−36
163 G. Ophiuchi	6.3	+0.29	− 6.6	−27 50.8	9	3 58.2	+ 7 35.8	−0.1530	0.5963	+0.0034	+ 7	−53
X Sagittarii (*var.*)	4.4	0.28	6.6	27 48.1		5 34.6	+ 9 8.1	−0.1889	0.5962	0.0086	+ 5	−55
4 G. Sagittarii	6.2	0.27	6.8	26 56.9		5 55.8	+ 9 28.4	−1.0538	0.5962	0.0097	−43	−90
10 G. Sagittarii	5.7	0.25	6.5	28 3.2		9 0.8	−11 34.2	+0.1169	0.5958	0.0197	+22	−37
210 B. Scorpii	5.8	0.24	6.4	28 45.1		9 44.5	−10 52.4	+0.8426	0.5957	0.0220	+61	+ 6
38 B. Sagittarii	4.7	+0.21	− 6.4	−28 28.1		13 18.5	− 7 27.2	+0.6540	0.5950	+0.0335	+56	− 6
C. D.−28° 14268	6.4	0.20	6.3	28 55.3		14 46.3	− 6 3.1	+1.1682	0.5946	0.0382	+61	+34
48 G. Sagittarii	6.3	0.18	6.5	28 19.1		16 50.2	− 4 4.2	+0.6390	0.5941	0.0447	+56	− 7
62 B. Sagittarii	6.0	0.18	6.3	28 41.0		16 50.3	− 4 4.1	+1.0107	0.5941	0.0447	+61	+18
66 B. Sagittarii	4.7	0.18	6.8	27 4.6		17 6.6	− 3 48.5	−0.6145	0.5940	0.0456	−14	−90
58 G. Sagittarii	6.1	+0.17	− 6.4	−28 28.3		18 35.4	− 2 23.3	+0.8783	0.5935	+0.0503	+62	+ 8
68 G. Sagittarii	6.2	0.15	6.8	26 41.3		20 48.0	− 0 16.2	−0.8207	0.5927	0.0572	−24	−90
69 G. Sagittarii	6.3	0.15	6.8	26 48.6		20 56.5	− 0 8.1	−0.6873	0.5927	0.0577	−17	−90
86 B. Sagittarii	6.5	0.15	6.8	26 38.3		21 16.1	+ 0 10.7	−0.8439	0.5926	0.0587	−25	−90
φ Sagittarii	3.3	0.10	6.6	27 4.9	10	3 40.1	+ 6 19.2	+0.0458	0.5898	0.0784	+23	−41
σ Sagittarii	2.1	+0.08	− 6.8	−26 24.3		7 23.9	+ 9 53.9	−0.3311	0.5879	+0.0895	+ 5	−65
201 B. Sagittarii	5.9	0.04	6.8	26 3.1		14 25.9	− 7 20.9	+0.0094	0.5838	0.1099	+24	−43
ψ Sagittarii	4.9	0.03	6.9	25 24.4		15 21.2	− 6 27.8	−0.5496	0.5833	0.1125	− 4	−61
χ Sagittarii	4.9	+0.01	7.0	24 40.6		19 13.6	− 2 44.5	−0.8410	0.5807	0.1232	−19	−90
51 Sagittarii	5.8	0.00	6.8	24 54.5		23 32.1	+ 1 23.9	−0.0486	0.5776	0.1347	+24	−47
h Sagittarii	4.7	−0.01	− 6.8	−25 4.4		23 48.2	+ 1 39.4	+0.1582	0.5774	+0.1354	+34	−35
53 Sagittarii	6.3	0.02	7.0	23 37.4	11	1 5.2	+ 2 53.4	−1.1536	0.5765	0.1387	−40	−90
274 B. Sagittarii	6.1	0.02	7.0	23 37.6		1 12.4	+ 3 0.3	−1.1348	0.5764	0.1390	−38	−90
308 B. Sagittarii	6.3	0.04	6.8	24 9.3		6 59.4	+ 8 34.0	+0.2539	0.5719	0.1535	+41	−30
329 B. Sagittarii	6.1	0.05	6.9	22 58.4		9 56.1	+11 24.1	−0.4989	0.5696	0.1605	+ 3	−70
336 B. Sagittarii	6.5	−0.06	− 6.9	−22 50.2		10 54.7	−11 39.5	−0.4822	0.5688	+0.1628	+ 5	−75
				NEW	*MOON.*							
13 Piscium	6.4	−0.09	− 1.5	− 1 33.3	15	14 42.1	−11 4.6	+0.5914	0.5014	+0.2665	+80	−14
14 Piscium	5.9	0.09	1.5	− 1 43.0		15 52.1	− 9 56.6	+1.0761	0.5011	0.2663	+88	+14
λ Piscium	4.6	−0.10	− 0.8	+ 1 18.7		20 7.2	− 5 48.7	−1.0449	0.5000	+0.2658	−13	−89
21 Piscium	5.6	0.07	0.5	0 36.2	16	0 6.1	− 1 56.6	+0.7734	0.4991	0.2650	+90	− 4
22 Piscium	5.8	0.08	0.1	2 27.5		1 27.2	− 0 37.8	−0.8649	0.4988	0.2647	− 1	−88
25 Piscium	6.2	−0.07	− 0.2	1 37.1		2 3.2	− 0 2.8	+0.1988	0.4987	0.2646	+55	−33
51 Piscium	5.6	+0.02	+ 2.3	6 29.2		23 21.2	− 3 20.6	+0.4821	0.4968	0.2553	+72	−18
136 B. Piscium	6.5	+0.03	+ 3.2	+ 8 53.5	17	4 7.5	+ 1 17.8	−0.9237	0.4970	+0.2522	− 5	−81
η Piscium	3.7	0.20	6.5	14 54.6	18	7 5.3	+ 3 29.9	−1.0079	0.5015	0.2286	−12	−75
101 Piscium	6.2	0.23	6.5	14 13.7		9 22.0	+ 5 42.6	+0.2579	0.5022	0.2261	+58	−26
105 Piscium	6.1	0.24	7.1	15 58.6		11 24.7	+ 7 41.8	−1.2040	0.5028	0.2238	−27	−74
4 Arietis	5.8	0.28	7.6	16 32.1		15 52.7	−11 58.0	−0.8311	0.5042	0.2185	0	−73
ι Arietis	5.1	+0.32	+ 8.1	+17 24.3		20 39.7	− 7 19.3	−0.7595	0.5059	+0.2126	+ 3	−73
35 B. Arietis	6.4	0.35	8.4	17 50.9		23 57.6	− 4 7.3	−0.5532	0.5072	0.2083	+14	−66
47 B. Arietis	6.5	0.38	8.4	17 37.6	19	2 3.6	− 2 4.9	+0.1238	0.5080	0.2055	+51	−30
20 H^1. Arietis	6.4	0.39	8.2	16 49.7		2 53.7	− 1 16.2	+1.1767	0.5083	0.2043	+90	+31
15 Arietis	5.9	0.38	9.0	19 6.1		3 30.8	− 0 40.2	−1.2063	0.5086	0.2035	−29	−71
θ Arietis	5.6	+0.43	+ 9.2	+19 30.7		7 21.8	+ 3 3.9	−0.8856	0.5102	+0.1981	− 5	−70
26 Arietis	6.2	0.50	9.5	19 28.9		13 43.3	+ 9 14.0	+0.3767	0.5130	0.1886	+66	−15
ν Arietis	5.4	0.54	10.4	21 35.8		17 49.2	−10 47.6	−1.2029	0.5149	0.1822	−31	−68
μ Arietis	5.7	0.58	9.8	19 39.2		19 37.1	− 9 3.0	+1.2729	0.5158	0.1793	+85	+46
ε Arietis (*mean*)	4.6	0.68	10.5	21 0.2	20	3 57.6	− 0 57.9	+1.2166	0.5198	0.1653	+90	+41
64 Arietis	5.8	+0.84	+11.8	+24 25.6		16 6.6	+10 48.1	−0.6974	0.5260	+0.1430	+ 5	−65

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.							Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.		Hour Angle, H	Y	x'	y'		N.	S.
		s	″	° ′	d	h m	h m					°	°
Tauri	5.9	+0.92	+11.8	+24 11.0	20	20 57.5	− 8 30.3	+0.2426	0.5286	+0.1335		+58	−15
Tauri	6.1	0.96	12.1	25 3.5		23 56.8	− 5 36.8	−0.3364	0.5301	0.1274		+25	−44
Tauri	5.4	0.99	11.7	24 1.6	21	1 51.9	− 3 45.5	+1.0468	0.5311	0.1235		+90	+32
Tauri	3.8	0.99	11.6	23 51.0		1 54.1	− 3 43.3	+1.2460	0.5311	0.1234		+83	+50
Tauri	5.6	0.99	11.9	24 34.6		2 1.5	− 3 36.2	+0.4573	0.5312	0.1231		+74	− 3
Tauri	4.3	+0.99	+11.8	+24 12.3		2 3.1	− 3 34.7	+0.8721	0.5312	+0.1231		+90	+20
Tauri	4.1	0.99	11.7	24 6.4		2 20.7	− 3 17.6	+1.0173	0.5314	0.1225		+90	+29
Tauri	5.8	1.00	11.8	24 17.6		2 22.8	− 3 15.6	+0.8146	0.5314	0.1224		+90	+17
Tauri	6.5	1.00	11.8	24 16.0		2 26.8	− 3 11.7	+0.8520	0.5314	0.1223		+90	+19
. Tauri	5.3	1.03	12.2	25 19.6		4 26.0	− 1 16.4	−0.0822	0.5325	0.1182		+39	−30
Tauri	5.6	+1.18	+12.3	+26 15.8		13 57.2	+ 7 55.9	−0.0895	0.5372	+0.0975		+39	−28
Tauri	5.0	1.25	12.5	27 9.1		18 18.5	−11 51.5	−0.6671	0.5393	0.0877		+ 6	−60
. Aurigæ	6.0	1.50	12.1	27 45.6	22	8 56.8	+ 2 16.9	−0.3022	0.5456	0.0531		+27	−36
. Aurigæ	6.5	1.58	11.7	27 34.9		14 13.6	+ 7 22.7	+0.1401	0.5476	0.0401		+52	−11
. Aurigæ	6.0	1.62	11.6	27 55.6		16 29.2	+ 9 33.6	−0.1559	0.5484	0.0345		+35	−25
. Tauri	6.4	+1.70	+11.2	+27 52.5		21 27.1	− 9 39.0	+0.0415	0.5500	+0.0219		+46	−14
Aurigæ	6.4	1.73	11.5	28 51.6		22 29.2	− 8 39.0	−1.0170	0.5503	0.0193		−19	−61
Tauri	1.8	1.75	11.2	28 32.4		23 46.3	− 7 24.6	−0.6430	0.5507	0.0160		+ 7	−55
. Aurigæ	6.5	1.80	10.6	27 36.6	23	4 0.9	− 3 19.0	+0.4198	0.5518	0.0051		+71	+ 7
. Aurigæ	5.7	1.80	10.3	26 52.5		4 33.7	− 2 47.4	+1.2273	0.5519	+0.0037		+80	+58
. Tauri	5.6	+1.91	+10.0	+27 56.8		10 34.6	+ 3 0.7	+0.0301	0.5532	−0.0119		+46	−14
Tauri	4.6	1.92	9.9	27 35.8		11 36.7	+ 4 0.6	+0.3989	0.5534	0.0146		+70	+ 5
. Aurigæ	6.4	1.96	10.1	28 56.0		12 59.7	+ 5 20.6	−1.0824	0.5537	0.0182		−25	−61
. Tauri	6.1	1.97	9.5	27 34.3		14 57.3	+ 7 14.1	+0.3616	0.5540	0.0233		+67	+ 2
Aurigæ	5.1	2.20	7.9	28 5.5	24	5 47.2	− 2 27.7	−0.8356	0.5551	0.0620		− 5	−62
Aurigæ	5.8	+2.23	+ 7.7	+28 20.5		7 40.2	− 0 38.7	−1.2263	0.5551	−0.0669		−42	−62
Geminorum	6.2	2.29	5.9	26 11.7		16 4.3	+ 7 27.3	+0.4403	0.5547	0.0885		+72	0
Geminorum	6.3	2.30	5.8	26 1.9		16 21.7	+ 7 44.1	+0.5905	0.5547	0.0892		+86	+ 8
Geminorum	5.6	2.38	5.4	26 59.9		21 32.2	−11 16.5	−0.9452	0.5541	0.1023		−12	−63
Geminorum	6.1	2.36	4.6	25 2.1		23 0.8	− 9 50.9	+1.0116	0.5539	0.1060		+90	+32
3. Geminorum	6.5	+2.41	+ 4.9	+26 50.7	25	0 0.7	− 8 53.2	−1.0397	0.5538	−0.1084		−19	−63
Geminorum	5.1	2.40	4.0	25 13.0		2 51.0	− 6 8.9	+0.3910	0.5534	0.1155		+69	− 5
3. Geminorum	6.3	2.45	2.9	24 33.1		9 20.1	+ 0 6.4	+0.3006	0.5522	0.1312		+62	−11
3. Geminorum	6.0	2.46	2.8	24 25.0		9 45.5	+ 0 30.9	+0.3894	0.5521	0.1322		+68	− 7
Geminorum	3.7	2.48	2.5	24 36.2		12 4.1	+ 2 44.6	−0.1218	0.5516	0.1376		+37	−33
Geminorum	6.3	+2.47	+ 1.9	+23 21.2		13 54.1	+ 4 30.8	+0.9555	0.5512	−0.1419		+90	+24
3. Geminorum	6.4	2.53	1.1	23 49.1		19 24.6	+ 9 49.7	−0.3571	0.5498	0.1545		+24	−48
Cancri	6.2	2.53	0.6	22 52.7		21 46.6	−11 53.2	+0.2681	0.5492	0.1598		+60	−16
Cancri	5.5	2.51	0.2	21 49.8		22 26.4	−11 14.8	+1.2755	0.5491	0.1613		+81	+50
B. Cancri	6.4	2.57	+ 0.1	23 23.7	26	1 4.0	− 8 42.6	−0.8155	0.5483	0.1670		− 2	−67
B. Cancri	6.0	+2.54	− 0.8	+21 1.0		4 4.4	− 5 48.4	+1.1895	0.5474	−0.1735		+90	+38
Cancri	5.5	2.57	1.8	20 43.8		9 38.5	− 0 25.8	+0.4909	0.5458	0.1850		+76	− 7
Cancri	6.5	2.58	2.4	20 18.5		12 59.5	+ 2 48.2	+0.3037	0.5447	0.1917		+62	−17
Cancri	6.5	2.58	2.4	20 16.3		13 1.8	+ 2 50.5	+0.3345	0.5447	0.1918		+64	−16
B. Cancri	6.5	2.58	2.5	19 58.2		13 6.8	+ 2 55.3	+0.6354	0.5447	0.1920		+88	0
Cancri	6.3	+2.58	− 2.5	+19 50.7		13 9.2	+ 2 57.7	+0.7594	0.5447	−0.1921		+90	+ 6
B. Cancri	6.1	2.59	3.4	19 9.0		17 50.5	+ 7 29.3	+0.5676	0.5432	0.2011		+81	− 5
B. Cancri	6.4	2.58	6.0	15 43.9	27	7 54.0	− 2 55.5	+1.1314	0.5390	0.2256		+90	+26
B. Leonis	6.3	2.61	6.2	16 57.1		9 52.7	− 1 0.8	−0.5887	0.5384	0.2287		+13	−70
Leonis	6.2	2.58	7.1	14 45.5		14 42.7	+ 3 39.6	+0.5675	0.5370	0.2360		+80	− 9
Leonis	6.5	+2.58	− 7.3	+14 43.8		15 42.8	+ 4 37.8	+0.3589	0.5368	−0.2375		+65	−20
Leonis	5.6	2.58	7.7	14 24.5		18 23.1	+ 7 12.8	+0.0518	0.5360	0.2413		+46	−36
Leonis	5.0	2.57	8.8	12 50.9	28	1 12.7	−10 11.1	−0.0127	0.5344	0.2502		+43	−40
Leonis	4.6	2.53	9.6	10 24.7		5 48.5	− 5 44.2	+1.3348	0.5334	0.2556		+84	+42
Leonis	1.3	2.56	9.5	12 22.8		6 1.3	− 5 31.9	−0.7470	0.5334	0.2559		+ 5	−78
Leonis	5.9	+2.52	−10.7	+ 9 12.9		14 2.9	+ 2 14.1	+0.4198	0.5320	−0.2642		+68	−20

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

The Star's					At Conjunction in R. A.					Limiting Parallels.
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x′	y′	N. S.
		Δα	Δδ							
		s	″	° ′	d h m	h m				° °
45 Leonis	5.8	+2.54	−10.8	+10 11.6	28 15 10.9	+ 3 19.9	−0.8842	0.5318	−0.2652	− 3 −80
ρ Leonis	3.8	2.53	11.1	9 44.5	17 38.7	+ 5 42.9	−1.0761	0.5314	0.2674	−15 −80
48 Leonis	5.2	2.49	11.3	7 23.3	18 36.7	+ 6 39.1	+1.0742	0.5314	0.2682	+90 +16
49 Leonis	5.7	+2.52	−11.3	+ 9 5.2	18 42.8	+ 6 45.0	−0.6913	0.5313	−0.2683	+ 8 −81

MARCH.

37 Sextantis	6.3	+2.49	−11.9	+ 6 49.1	1 0 0.2	+11 52.2	+0.1984	0.5308	−0.2724	+55 −32
56 Leonis	6.1	2.48	12.5	6 38.2	4 45.1	− 7 32.1	−0.9161	0.5305	0.2754	− 5 −81
d Leonis	5.0	2.44	12.7	4 4.2	6 55.9	− 5 25.5	+1.0960	0.5304	0.2767	+90 +16
75 Leonis	5.4	+2.41	−13.5	+ 2 28.5	14 56.1	+ 2 19.3	+0.4869	0.5305	−0.2802	+73 −19
76 Leonis	6.0	2.41	13.6	2 6.8	15 43.1	+ 3 4.8	+0.6344	0.5306	0.2805	+84 −11
79 Leonis	5.5	2.40	13.8	+ 1 52.2	18 9.9	+ 5 26.9	+0.1926	0.5307	0.2812	+54 −34
υ Leonis	4.5	2.37	14.2	− 0 21.5	2 0 19.5	+11 24.6	+0.7139	0.5314	0.2823	+90 − 7
9 B. Virginis	6.2	2.36	14.6	+ 0 9.0	6 4.4	− 7 1.7	−1.4228	0.5323	0.2825	−52 −72
78 B. Virginis	6.5	+2.27	−14.9	− 5 15.0	17 58.5	+ 4 29.2	+0.6753	0.5351	−0.2801	+84 − 9
χ Virginis	4.8	2.21	15.2	7 31.9	3 5 35.8	− 8 16.6	−0.2537	0.5392	0.2742	+29 −58
ψ Virginis	5.0	2.18	15.2	9 4.9	12 31.2	− 1 35.1	−0.5770	0.5421	0.2689	+12 −80
49 Virginis	5.2	2.14	15.2	10 17.4	18 39.4	+ 4 20.6	−0.9957	0.5451	0.2631	−12 −90
i Virginis	5.7	2.09	15.0	12 16.2	4 3 4.1	−11 32.2	−1.1828	0.5495	0.2535	−28 −90
75 Virginis	5.6	+2.07	−14.4	−14 55.8	5 45.9	− 8 56.1	+0.8080	0.5511	−0.2500	+75 − 1
83 Virginis	5.6	2.04	14.3	15 45.4	10 51.2	− 4 1.4	+0.3829	0.5541	0.2427	+59 −24
85 Virginis	6.1	2.04	14.4	15 20.7	11 20.0	− 3 33.6	−0.1457	0.5543	0.2420	+30 −52
43 H. Virginis	5.5	1.95	13.8	17 48.5	5 0 6.0	+ 8 44.7	−0.6310	0.5623	0.2205	+ 3 −87
231 G. Virginis	6.4	1.95	13.6	18 11.7	0 47.7	+ 9 24.8	−0.3965	0.5627	0.2192	+15 −68
236 G. Virginis	5.7	+1.94	−13.6	−18 19.6	1 27.6	+10 3.2	−0.4096	0.5632	−0.2179	+14 −69
9 G. Libræ	6.5	1.90	13.0	20 4.2	8 12.7	− 7 26.7	−0.0851	0.5675	0.2045	+29 −49
17 G. Libræ	6.4	1.86	12.8	20 49.2	12 52.8	− 2 57.1	−0.2634	0.5705	0.1944	+19 −55
18 G. Libræ	6.1	1.86	12.7	20 58.3	13 18.2	− 2 32.6	−0.1923	0.5708	0.1935	+22 −55
43 B. Libræ	5.7	1.84	12.8	21 2.2	17 26.0	+ 1 25.8	−0.9076	0.5734	0.1841	−17 −90
47 G. Libræ	6.1	+1.80	−12.2	−21 42.3	21 5.9	+ 4 57.2	−0.8944	0.5757	−0.1753	−17 −90
64 G. Libræ	5.8	1.77	12.0	22 5.3	6 1 4.6	+ 8 46.7	−1.1871	0.5780	0.1654	−40 −90
153 B. Libræ	6.3	1.72	11.1	24 12.3	7 41.9	− 8 51.5	−0.0955	0.5818	0.1482	+22 −49
42 Libræ	5.0	1.69	11.2	23 32.7	10 30.5	− 6 9.7	−1.1658	0.5833	0.1406	−41 −90
b Scorpii	4.7	1.66	10.3	25 29.8	14 39.5	− 2 10.6	+0.2424	0.5853	0.1290	+39 −32
A Scorpii	4.6	+1.65	−10.4	−25 4.6	15 41.3	− 1 11.2	−0.3126	0.5858	−0.1261	+ 9 −63
31 B. Scorpii	5.4	1.64	10.7	24 17.0	15 48.5	− 1 4.3	−1.1287	0.5859	0.1258	−39 −90
3 Scorpii	5.9	1.65	10.4	24 59.7	16 5.7	− 0 47.9	−0.4460	0.5860	0.1250	+ 2 −73
4 Scorpii	5.7	1.65	10.0	26 1.1	16 24.6	− 0 29.7	+0.5482	0.5862	0.1240	+55 −13
40 B. Scorpii	5.4	1.63	10.5	24 35.4	17 37.2	+ 0 40.0	−1.0432	0.5867	0.1206	−33 −90
π Scorpii	3.0	+1.64	−10.1	−25 52.4	17 42.5	+ 0 45.1	+0.2423	0.5867	−0.1203	+38 −30
48 B. Scorpii	4.9	1.62	10.1	25 37.9	19 27.1	+ 2 25.5	−0.2066	0.5875	0.1153	+14 −50
65 B. Scorpii	5.5	1.60	9.8	26 6.1	21 17.0	+ 4 10.9	+0.0623	0.5882	0.1099	+27 −49
85 B. Scorpii	6.0	1.57	10.0	25 15.9	23 54.0	+ 6 41.5	−1.0621	0.5892	0.1021	−30 −90
σ Scorpii	3.1	1.55	9.8	25 23.6	7 2 18.7	+ 9 0.4	−1.1711	0.5900	0.0949	−46 −90
α Scorpii	1.2	+1.52	− 9.3	−26 14.8	5 26.5	−11 59.5	−0.5889	0.5910	−0.0853	− 9 −76
116 B. Scorpii	6.2	1.51	9.3	26 21.4	6 11.6	−11 16.3	−0.5418	0.5912	0.0830	− 7 −81
τ Scorpii	2.9	1.51	8.6	28 2.6	7 53.0	− 9 39.0	+1.0315	0.5917	0.0778	+62 −20
134 B. Scorpii	6.4	1.47	8.6	27 18.0	11 5.5	− 6 34.4	+0.0448	0.5924	0.0678	+22 −45
135 B. Scorpii	6.0	1.47	8.2	28 21.3	11 20.8	− 6 19.7	+1.0971	0.5924	0.0670	+62 −20
95 G. Ophiuchi	6.1	+1.36	− 7.9	−27 39.6	21 44.7	+ 3 38.5	−0.1329	0.5936	−0.0341	+11 −52
43 Ophiuchi	5.4	1.31	7.5	28 3.8	8 1 52.8	+ 7 36.4	+0.1642	0.5935	−0.0209	+25 −34
163 G. Ophiuchi	6.3	1.23	7.1	27 50.8	9 26.5	− 9 8.6	−0.1234	0.5927	+0.0034	+ 8 −51
X Sagittarii (*var.*)	4.4	1.21	7.0	27 48.1	11 3.9	− 7 35.2	−0.1594	0.5924	0.0085	+ 7 −53
4 G. Sagittarii	6.2	1.20	7.3	26 56.9	11 25.3	− 7 14.7	−1.0275	0.5923	0.0097	−42 −90
10 G. Sagittarii	5.7	+1.17	− 6.7	−28 3.2	14 32.3	− 4 15.3	+0.1475	0.5916	+0.0196	+23 −35

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	"	° '	d h m	h m				°	°
. Scorpii	5.8	+1.17	- 6.4	-28 45.1	8 15 16.5	- 3 33.0	+0.8762	0.5914	+0.0219	+61	+ 8
. Sagittarii	4.7	1.13	6.2	28 28.1	18 53.1	- 0 5.2	+0.6871	0.5903	0.0332	+59	- 4
C. D.-28° 14268	6.4	1.11	6.0	28 55.3	20 22.1	+ 1 20.1	+1.2039	0.5898	0.0379	+61	+39
. Sagittarii	6.3	1.09	6.1	28 19.1	22 27.7	+ 3 20.7	+0.6724	0.5890	0.0443	+58	- 5
. Sagittarii	6.0	1.09	5.9	28 41.0	22 27.9	+ 3 20.9	+1.0459	0.5890	0.0443	+61	+21
. Sagittarii	4.7	+1.07	- 6.5	-27 4.6	22 44.4	+ 3 36.6	-0.5877	0.5889	+0.0452	-12	-86
. Sagittarii	6.1	1.07	5.9	28 28.3	9 0 14.4	+ 5 3.1	+0.9130	0.5883	0.0498	+62	+11
. Sagittarii	6.2	1.03	6.4	26 41.3	2 29.1	+ 7 12.3	-0.7954	0.5874	0.0567	-23	-90
. Sagittarii	6.3	1.03	6.3	26 48.6	2 37.7	+ 7 20.5	-0.6613	0.5873	0.0571	-16	-90
. Sagittarii	6.5	1.02	6.4	26 38.3	2 57.5	+ 7 39.5	-0.8188	0.5871	0.0581	-24	-90
Sagittarii	3.3	+0.96	- 5.8	-27 4.8	9 27.8	-10 5.8	+0.0756	0.5839	+0.0775	+25	-39
Sagittarii	2.1	0.91	5.7	26 24.3	13 15.6	- 6 27.0	-0.3042	0.5817	0.0885	+ 6	-63
. Sagittarii	5.9	0.84	5.4	26 3.1	20 25.5	+ 0 26.1	+0.0380	0.5772	0.1085	+26	-42
Sagittarii	4.9	0.82	5.5	25 24.3	21 21.8	+ 1 20.2	-0.5254	0.5766	0.1110	- 3	-80
Sagittarii	4.9	0.78	5.5	24 40.6	10 1 18.8	+ 5 8.1	-0.8198	0.5738	0.1216	-18	-90
Sagittarii	5.8	+0.74	- 5.1	-24 54.4	5 42.7	+ 9 21.9	-0.0218	0.5706	+0.1328	+25	-45
Sagittarii	4.7	0.74	5.1	25 4.4	5 59.2	+ 9 37.9	+0.1867	0.5704	0.1335	+36	-33
Sagittarii	6.3	0.71	5.4	23 37.4	7 17.8	+10 53.5	-1.1366	0.5694	0.1368	-38	-90
. Sagittarii	6.1	0.71	5.4	23 37.6	7 25.1	+11 0.5	-1.1175	0.5693	0.1371	-36	-90
. Sagittarii	6.3	0.66	4.9	24 9.3	13 19.6	- 7 18.2	+0.2820	0.5648	0.1513	+43	-28
. Sagittarii	6.1	+0.62	- 5.0	-22 58.4	16 20.1	- 4 24.4	-0.4781	0.5624	+0.1583	+ 5	-75
. Sagittarii	6.5	0.61	5.0	22 50.2	17 20.0	- 3 26.7	-0.4616	0.5616	0.1605	+ 6	-73
Capricorni	5.7	0.56	4.8	22 4.5	23 28.3	+ 2 28.4	-0.2273	0.5567	0.1738	+19	-57
. Capricorni	6.2	0.52	4.3	22 40.5	11 4 28.9	+ 7 18.2	+1.2956	0.5526	0.1839	+67	+44
Capricorni	5.7	0.40	4.7	18 14.8	15 50.9	- 5 43.4	-1.1181	0.5435	0.2045	-29	-90
Capricorni	6.2	+0.40	- 4.3	-19 22.0	18 1.5	- 3 37.2	+0.5028	0.5418	+0.2081	+62	-17
Capricorni	6.5	0.38	4.6	17 51.8	18 37.4	- 3 2.5	-0.9461	0.5413	0.2090	-16	-90
Capricorni	4.2	0.37	4.5	17 34.4	20 57.8	- 0 46.9	-0.7590	0.5395	0.2127	- 4	-90
URANUS	6.0	. . .	. . .	17 18.1	23 7.0	+ 1 18.0	-0.5828	0.5358	0.2154	+ 6	-82
. Capricorni	6.1	0.34	4.2	17 41.9	12 1 13.5	+ 3 20.3	+0.2929	0.5362	0.2190	+52	-28
Capricorni	5.4	+0.34	- 3.9	-18 20.6	2 33.1	+ 4 37.3	+1.2622	0.5352	+0.2209	+72	+35
Capricorni	6.3	0.34	4.0	17 49.2	2 42.0	+ 4 45.9	+0.7463	0.5351	0.2211	+72	- 3
Capricorni	4.3	0.32	4.1	17 11.9	4 35.1	+ 6 35.4	+0.5123	0.5336	0.2237	+65	-17
Capricorni	5.1	0.24	4.0	14 25.7	13 51.5	- 8 26.1	-0.2736	0.5270	0.2353	+25	-59
Capricorni	6.0	0.24	3.9	14 47.4	14 35.4	- 7 43.6	+0.2802	0.5265	0.2361	+54	-29
Capricorni	5.8	+0.25	- 3.8	-15 8.4	15 2.7	- 7 17.2	+0.7579	0.5262	+0.2366	+75	- 4
. Capricorni	6.1	0.22	3.9	13 7.2	17 49.8	- 4 35.4	-0.7112	0.5244	0.2396	+ 2	-90
Capricorni	5.2	0.22	- 3.7	13 57.2	19 34.8	- 2 53.7	+0.5897	0.5232	0.2414	+73	-13
MERCURY	0.7	. . .	. . .	-12 53.8	20 35.9	- 1 54.4	-0.2820	0.4962	0.2427	+26	-60
				NEW	*MOON.*						
Piscium	3.7	0.00	+ 4.7	+14 54.6	17 15 6.0	-10 41.6	-1.0811	0.5042	+0.2291	-17	-75
Piscium	6.2	+0.02	4.8	14 13.7	17 22.1	- 8 29.4	+0.1837	0.5049	0.2266	+54	-30
Piscium	6.1	0.02	5.2	15 58.6	19 24.2	- 6 30.9	-1.2798	0.5055	0.2243	-35	-74
Arietis	5.8	0.04	5.6	16 32.1	23 50.9	- 2 12.0	-0.9095	0.5070	0.2191	- 6	-73
Arietis	5.1	+0.06	+ 6.1	+17 24.3	18 4 36.5	+ 2 25.3	-0.8409	0.5087	+0.2131	- 2	-73
B. Arietis	6.4	0.08	6.4	17 50.8	7 53.5	+ 5 36.5	-0.6365	0.5099	0.2088	+10	-71
B. Arietis	6.5	0.10	6.4	17 37.6	9 58.8	+ 7 38.0	+0.0394	0.5107	0.2059	+46	-34
H¹. Arietis	6.4	0.11	6.3	16 49.7	10 48.7	+ 8 26.5	+1.0920	0.5110	0.2048	+90	+24
Arietis	5.9	0.10	6.8	19 6.1	11 25.7	+ 9 2.4	-1.2919	0.5112	0.2039	-39	-71
Arietis	5.6	+0.13	+ 7.2	+19 30.6	15 15.5	-11 14.7	-0.9733	0.5128	+0.1985	-11	-70
Arietis	6.2	0.18	7.6	19 28.8	21 35.5	- 5 6.2	+0.2860	0.5154	0.1889	+60	-19
Arietis	5.4	0.20	8.4	21 35.8	19 1 40.5	- 1 8.6	-1.2965	0.5172	0.1825	-43	-68
Arietis	5.7	0.24	8.0	19 39.1	3 28.1	+ 0 35.7	+1.1798	0.5180	0.1795	+90	+36
Arietis (*mean*)	4.6	0.31	8.7	21 0.2	11 47.3	+ 8 39.4	+1.1200	0.5217	0.1653	+90	+32
Arietis	5.8	+0.43	+10.1	+24 25.6	23 55.5	- 3 35.3	-0.8012	0.5272	+0.1428	- 2	-66

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
7 Tauri	5.9	+0.49	+10.1	+24 11.0	**20** 4 46.5	+ 1 6.5	+0.1385	0.5295	+0.1333	+52	−20
11 Tauri	6.1	0.52	10.5	25 3.5	7 46.0	+ 4 0.2	−0.4427	0.5308	0.1272	+19	−50
16 Tauri	5.4	0.55	10.2	24 1.5	9 41.3	+ 5 51.7	+0.9429	0.5316	0.1232	+90	+25
17 Tauri	3.8	0.55	10.1	23 51.0	9 43.5	+ 5 53.9	+1.1425	0.5317	0.1231	+90	+40
18 Tauri	5.6	0.55	10.4	24 34.6	9 50.9	+ 6 1.0	+0.3521	0.5317	0.1229	+66	− 8
q Tauri	4.3	+0.56	+10.2	+24 12.3	9 52.5	+ 6 2.5	+0.7678	0.5317	+0.1228	+90	+14
20 Tauri	4.1	0.56	10.2	24 6.3	10 10.2	+ 6 19.7	+0.9131	0.5318	0.1222	+90	+23
21 Tauri	5.8	0.56	10.3	24 17.6	10 12.3	+ 6 21.8	+0.7100	0.5319	0.1221	+90	+10
22 Tauri	6.5	0.56	10.3	24 16.0	10 16.3	+ 6 25.6	+0.7475	0.5319	0.1220	+90	+13
η Tauri	3.0	0.57	10.2	23 50.8	10 57.3	+ 7 5.3	+1.2966	0.5322	0.1206	+70	+59
14 H. Tauri	5.3	+0.58	+10.6	+25 19.6	12 15.8	+ 8 21.2	−0.1895	0.5328	+0.1178	+33	−35
p Tauri	5.6	0.72	11.0	26 15.8	21 49.0	− 6 24.5	−0.1996	0.5368	0.0971	+32	−34
φ Tauri	5.0	0.78	11.3	27 9.1	**21** 2 11.6	− 2 10.6	−0.7801	0.5385	0.0873	− 1	−63
χ Tauri	5.3	0.80	10.8	25 26.0	3 14.7	− 1 9.7	+1.2144	0.5389	0.0849	+85	+50
17 B. Aurigæ	6.0	1.01	11.3	27 45.6	16 56.4	−11 55.8	−0.4174	0.5436	0.0527	+20	−42
38 B. Aurigæ	6.5	+1.09	+11.0	+27 34.9	22 16.3	− 6 46.8	+0.0261	0.5451	+0.0397	+45	−16
47 B. Aurigæ	6.0	1.13	11.1	27 55.6	**22** 0 33.4	− 4 34.4	−0.2716	0.5457	0.0341	+28	−32
354 B. Tauri	6.4	1.20	10.9	27 52.5	5 34.8	+ 0 16.5	−0.0737	0.5468	0.0217	+30	−20
22 Aurigæ	6.4	1.23	11.2	28 51.6	6 37.6	+ 1 17.2	−1.1380	0.5470	0.0190	−31	−61
β Tauri	1.8	1.25	11.0	28 32.4	7 55.7	+ 2 32.6	−0.7622	0.5473	0.0158	− 1	−61
107 B. Aurigæ	6.5	+1.31	+10.4	+27 36.6	12 13.7	+ 6 41.6	+0.3063	0.5480	+0.0050	+63	+ 1
112 B. Aurigæ	5.7	1.31	10.1	26 52.5	12 46.9	+ 7 13.6	+1.1185	0.5481	+0.0036	+90	+49
406 B. Tauri	5.6	1.42	10.1	27 56.8	18 53.0	−10 53.0	−0.0859	0.5490	−0.0118	+30	−21
136 Tauri	4.6	1.43	9.9	27 35.8	19 56.0	− 9 52.2	+0.2853	0.5491	0.0145	+62	− 1
154 B. Aurigæ	6.4	1.47	10.3	28 56.0	21 20.3	− 8 30.9	−1.2054	0.5492	0.0181	−40	−61
415 B. Tauri	6.1	+1.49	+ 9.7	+27 34.3	23 19.8	− 6 35.6	+0.2478	0.5494	−0.0231	+59	− 4
49 Aurigæ	5.1	1.73	8.5	28 5.5	**23** 14 24.9	+ 7 57.8	−0.9566	0.5496	0.0613	−14	−62
37 Geminorum	5.7	1.83	6.6	25 29.1	23 21.4	− 7 24.5	+1.2338	0.5489	0.0835	+82	+53
39 Geminorum	6.2	1.86	6.7	26 11.7	**24** 0 53.5	− 5 55.6	+0.3301	0.5487	0.0873	+64	− 5
40 Geminorum	6.3	1.86	6.6	26 1.9	1 11.2	− 5 38.4	+0.4814	0.5487	0.0880	+76	+ 2
47 Geminorum	5.6	+1.96	+ 6.3	+26 59.9	6 27.8	− 0 32.8	−1.0645	0.5480	−0.1009	−22	−63
52 Geminorum	6.1	1.95	5.5	25 2.1	7 58.1	+ 0 54.3	+0.9072	0.5478	0.1045	+90	+25
134 B. Geminorum	6.5	1.99	6.0	26 50.7	8 59.2	+ 1 53.3	−1.1591	0.5477	0.1069	−31	−63
A Geminorum	5.1	2.00	5.1	25 13.0	11 52.9	+ 4 41.0	+0.2830	0.5471	0.1138	+61	−10
176 B. Geminorum	6.3	2.08	4.0	24 33.1	18 29.7	+11 4.0	+0.1939	0.5458	0.1293	+55	−17
181 B. Geminorum	6.0	+2.08	+ 3.9	+24 25.0	18 55.7	+11 29.1	+0.2836	0.5457	−0.1303	+61	−12
κ Geminorum	3.7	2.12	3.7	24 36.2	21 17.0	−10 14.5	−0.2304	0.5453	0.1356	+31	−30
82 Geminorum	6.3	2.12	3.0	23 21.2	23 9.2	− 8 26.1	+0.8554	0.5448	0.1399	+90	+18
5 B. Cancri	6.4	2.20	2.4	23 49.1	**25** 4 46.2	− 3 0.7	−0.4644	0.5435	0.1523	+18	−54
9 Cancri	6.2	2.21	1.8	22 52.8	7 10.8	− 0 41.0	+0.1663	0.5430	0.1575	+53	−21
μ Cancri	5.5	+2.19	+ 1.3	+21 49.8	7 51.4	− 0 1.8	+1.1810	0.5428	−0.1589	+90	+30
35 B. Cancri	6.4	2.26	1.5	23 23.7	10 32.0	+ 2 33.2	−0.9232	0.5421	0.1646	− 9	−67
49 B. Cancri	6.0	2.24	+ 0.2	21 1.0	13 35.9	+ 5 31.0	+1.0970	0.5413	0.1710	+90	+31
η Cancri	5.5	2.30	− 0.6	20 43.8	19 16.0	+10 59.7	+0.3968	0.5399	0.1824	+68	−12
39 Cancri	6.5	2.32	1.3	20 18.5	22 40.5	− 9 42.8	+0.2105	0.5390	0.1890	+56	−22
40 Cancri	6.5	+2.32	− 1.3	+20 16.3	22 42.9	− 9 40.4	+0.2415	0.5390	−0.1891	+58	−20
102 B. Cancri	6.5	2.32	1.4	19 58.3	22 48.0	− 9 35.5	+0.5443	0.5390	0.1893	+79	− 5
ε Cancri	6.3	2.32	1.4	19 50.7	22 50.4	− 9 33.1	+0.6690	0.5390	0.1894	+90	+ 1
139 B. Cancri	6.1	2.35	2.3	19 9.0	**26** 3 36.5	− 4 56.7	+0.4790	0.5378	0.1983	+74	−10
227 B. Cancri	6.4	2.41	5.3	15 43.7	17 52.4	+ 8 50.9	+1.0557	0.5346	0.2228	+90	+21
12 B. Leonis	6.3	+2.45	− 5.2	+16 57.1	19 52.6	+10 47.2	−0.6698	0.5342	−0.2260	+ 8	−73
7 Leonis	6.2	2.45	6.5	14 45.5	**27** 0 46.0	− 8 29.0	+0.4952	0.5322	0.2334	+74	−13
11 Leonis	6.5	2.45	6.6	14 43.8	1 46.7	− 7 30.2	+0.2868	0.5330	0.2348	+60	−24
ψ Leonis	5.6	2.47	7.1	14 24.5	4 28.7	− 4 53.5	−0.0187	0.5326	0.2387	+43	−39
ν Leonis	5.0	2.49	8.4	12 50.9	11 21.8	+ 1 46.2	−0.0762	0.5317	0.2478	+40	−44
A Leonis	4.6	+2.47	− 9.5	+10 24.7	15 59.4	+ 6 14.8	+1.2783	0.5312	−0.2534	+90	+3

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
Leonis	1.3	+2.51	− 9.1	+12 22.8	27 16 12.3	+ 6 27.3	−0.8060	0.5312	−0.2536	+ 1	−78
Leonis	5.9	2.50	10.8	9 12.9	28 0 15.8	− 9 44.9	+0.3712	0.5307	0.2623	+65	−23
Leonis	5.8	2.53	10.7	10 11.6	1 24.0	− 8 38.9	−0.9312	0.5306	0.2634	− 6	−80
Leonis	3.8	2.53	11.1	9 44.5	3 52.0	− 6 15.7	−1.1194	0.5306	0.2657	−19	−80
Leonis	5.2	2.50	11.7	7 23.3	4 50.1	− 5 19.4	+1.0306	0.5306	0.2666	+90	+13
Leonis	5.7	+2.52	−11.4	+ 9 5.2	4 56.1	− 5 13.6	−0.7335	0.5307	−0.2667	+ 6	−80
Sextantis	6.3	2.52	12.4	6 49.1	10 13.4	− 0 6.5	+0.1623	0.5307	0.2710	+52	−34
Leonis	6.1	2.54	13.0	6 38.1	14 57.6	+ 4 28.5	−0.9433	0.5311	0.2744	− 6	−83
Leonis	5.0	2.51	13.6	4 4.2	17 7.9	+ 6 34.6	+1.0664	0.5313	0.2757	+90	+14
Leonis	5.4	2.52	14.6	2 28.4	29 1 5.1	− 9 43.6	+0.4697	0.5325	0.2798	+72	−19
Leonis	6.0	+2.52	−14.7	+ 2 6.8	1 51.7	− 8 58.5	+0.6176	0.5326	−0.2801	+83	−12
Leonis	5.5	2.53	15.0	+ 1 52.2	4 17.2	− 6 37.7	+0.1812	0.5331	0.2810	+54	−34
Leonis	4.5	2.52	15.7	− 0 21.5	10 23.0	− 0 43.8	+0.7081	0.5345	0.2825	+88	− 7
3. Virginis	6.2	2.54	16.1	+ 0 9.0	16 3.4	+ 4 45.4	−1.4060	0.5362	0.2831	−48	−76
3. Virginis	6.5	2.53	17.2	− 5 15.1	30 3 45.7	− 7 55.6	+0.6939	0.5406	0.2815	+85	− 8
Virginis	4.8	+2.54	−17.9	− 7 32.0	15 8.4	+ 3 4.0	−0.2092	0.5460	−0.2761	+31	−55
Virginis	5.0	2.54	18.1	9 5.0	21 53.8	+ 9 35.4	−0.5185	0.5497	0.2712	+15	−75
Virginis	5.2	2.54	18.2	10 17.5	31 3 52.3	− 8 38.6	−0.9229	0.5533	0.2656	− 8	−90
Virginis	5.7	2.54	18.2	12 16.2	12 2.9	− 0 45.4	−1.0952	0.5586	0.2562	−21	−90
Virginis	5.6	2.54	18.0	14 55.9	14 39.9	+ 1 45.9	+0.8722	0.5603	0.2527	+75	+ 3
Virginis	5.6	+2.54	−17.8	−15 45.4	19 36.0	+ 6 31.2	+0.4592	0.5637	−0.2456	+63	−20
Virginis	6.1	+2.54	−17.9	−15 20.7	20 3.9	+ 6 58.2	−0.0613	0.5640	−0.2448	+35	−47

APRIL.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
H. Virginis	5.5	+2.53	−17.3	−17 48.6	1 8 25.6	− 5 7.9	−0.5240	0.5727	−0.2233	+ 8	−77
G. Virginis	6.4	2.53	17.2	18 11.7	9 6.0	− 4 29.0	−0.2922	0.5732	0.2220	+20	−61
G. Virginis	5.7	2.53	17.2	18 19.6	9 44.6	− 3 51.9	−0.3043	0.5737	0.2207	+19	−61
G. Libræ	6.5	2.53	16.6	20 4.3	16 16.4	+ 2 24.9	+0.0226	0.5783	0.2071	+34	−42
G. Libræ	6.4	2.53	16.2	20 49.2	20 47.2	+ 6 45.1	−0.1483	0.5813	0.1969	+25	−52
G. Libræ	6.1	+2.53	−16.2	−20 58.4	21 11.9	+ 7 8.9	−0.0779	0.5816	−0.1960	+28	−48
B. Libræ	5.7	2.54	16.4	21 2.3	2 1 11.5	+10 59.0	−0.7781	0.5843	0.1864	−10	−90
G. Libræ	6.1	2.51	15.5	21 42.4	4 44.0	− 9 37.0	−0.7617	0.5866	0.1776	−10	−90
G. Libræ	5.8	2.50	15.2	22 5.4	8 35.0	− 5 55.3	−1.0464	0.5889	0.1675	−29	−90
B. Libræ	6.3	2.49	14.2	24 12.3	14 59.3	+ 0 13.4	+0.0337	0.5925	0.1500	+29	−42
Libræ	5.0	+2.47	−14.1	−23 32.8	17 42.5	+ 2 49.9	−1.0181	0.5939	−0.1422	−29	−90
Scorpii	4.7	2.47	13.2	25 29.8	21 43.8	+ 6 41.3	+0.3718	0.5957	0.1305	+45	−23
Scorpii	4.6	2.46	13.2	25 4.7	22 43.6	+ 7 38.6	−0.1742	0.5962	0.1275	+16	−54
B. Scorpii	5.4	2.45	13.4	24 17.1	22 50.6	+ 7 45.3	−0.9780	0.5962	0.1271	−28	−90
Scorpii	5.9	2.46	13.2	24 59.8	23 7.3	+ 8 1.3	−0.3054	0.5963	0.1263	+10	−62
Scorpii	5.7	+2.47	−12.9	−26 1.2	23 25.6	+ 8 18.8	+0.6743	0.5964	−0.1254	+62	− 6
B. Scorpii	5.4	2.45	13.1	24 35.4	3 0 36.0	+ 9 26.4	−0.8927	0.5970	0.1218	−23	−90
Scorpii	3.0	2.46	12.8	25 52.4	0 41.1	+ 9 31.3	+0.3738	0.5970	0.1216	+45	−23
B. Scorpii	4.9	2.45	12.7	25 38.0	2 22.5	+11 8.5	−0.0672	0.5977	0.1165	+21	−47
B. Scorpii	6.4	2.43	13.0	24 29.8	2 36.0	+11 21.4	−1.2248	0.5977	0.1158	−50	−84
B. Scorpii	5.5	+2.44	−12.3	−26 6.2	4 9.1	−11 9.4	+0.1989	0.5982	−0.1110	+34	−32
B. Scorpii	6.0	2.42	12.3	25 15.9	6 41.4	− 8 43.5	−0.9077	0.5991	0.1031	−25	−90
Scorpii	3.1	2.40	12.0	25 23.6	9 2.0	− 6 28.8	−1.0138	0.5997	0.0957	−33	−90
Scorpii	1.2	2.39	11.4	26 14.8	12 4.4	− 3 34.0	−0.4381	0.6004	0.0860	− 1	−72
B. Scorpii	6.2	2.39	11.3	26 21.4	12 48.3	− 2 52.0	−0.3913	0.6006	0.0837	+ 1	−69
Scorpii	2.9	+2.40	−10.6	−28 2.6	14 26.8	− 1 17.6	+1.1613	0.6009	−0.0784	+62	+33
4 B. Scorpii	6.4	2.36	10.5	27 18.0	17 34.1	+ 1 41.7	+0.1900	0.6013	0.0683	+30	−33
5 B. Scorpii	6.0	2.38	10.1	28 21.3	17 49.0	+ 1 56.0	+1.2284	0.6013	0.0674	+62	+42
8 B. Ophiuchi	6.2	2.28	9.7	26 24.1	4 1 55.7	+ 9 42.0	−1.1681	0.6016	0.0408	−50	−90
5 G. Ophiuchi	6.1	2.28	9.0	27 39.6	3 57.3	+11 38.5	+0.0196	0.6014	0.0341	+18	−43
6 Oph. (*1st star*)	5.4	+2.24	− 9.6	−26 28.9	5 4.4	−11 17.3	−1.2009	0.6013	−0.0304	−54	−85

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
43 Ophiuchi	5.4	+2.25	−8.4	−28 3.8	4 7 59.7	− 8 29.3	+0.3149	0.6009	−0.0207	+33	−26
163 G. Ophiuchi	6.3	2.17	7.5	27 50.8	15 23.9	− 1 23.9	+0.0333	0.5991	+0.0037	+16	−42
X Sagittarii (*var.*)	4.4	2.15	7.3	27 48.1	16 59.3	+ 0 7.6	−0.0019	0.5985	0.0089	+15	−44
4 G. Sagittarii	6.2	2.13	7.6	26 56.9	17 20.3	+ 0 27.6	−0.8609	0.5984	0.0100	−31	−90
10 G. Sagittarii	5.7	2.12	6.8	28 3.2	20 23.9	+ 3 23.6	+0.3030	0.5973	0.0200	+32	−26
210 B. Scorpii	5.8	+2.12	−6.4	−28 45.1	21 7.3	+ 4 5.2	+1.0249	0.5970	+0.0223	+61	+20
38 B. Sagittarii	4.7	2.08	6.0	28 28.1	5 0 40.3	+ 7 29.4	+0.8390	0.5954	0.0337	+62	− 6
48 G. Sagittarii	6.3	2.04	5.7	28 19.1	4 11.5	+10 51.9	+0.8256	0.5936	0.0448	+62	+ 5
62 B. Sagittarii	6.0	2.04	5.5	28 41.0	4 11.7	+10 52.0	+1.1960	0.5936	0.0448	+61	−38
66 B. Sagittarii	4.7	2.01	6.0	27 4.5	4 27.9	+11 7.5	−0.4236	0.5935	0.0456	− 4	−71
58 G. Sagittarii	6.1	+2.02	−5.4	−28 28.3	5 56.7	−11 27.3	+1.0648	0.5927	+0.0503	+62	+23
68 G. Sagittarii	6.2	1.96	5.7	26 41.3	8 9.5	− 9 20.0	−0.6293	0.5914	0.0571	−14	−90
69 G. Sagittarii	6.3	1.96	5.6	26 48.6	8 18.0	− 9 11.7	−0.4962	0.5913	0.0575	− 6	−77
86 B. Sagittarii	6.5	1.95	5.6	26 38.3	8 37.5	− 8 53.1	−0.6524	0.5910	0.0585	−15	−90
φ Sagittarii	3.3	1.89	4.6	27 4.8	15 3.1	− 2 43.1	+0.2359	0.5870	0.0778	+33	−30
σ Sagittarii	2.1	+1.83	−4.4	−26 24.3	18 48.6	+ 0 53.4	−0.1411	0.5843	+0.0888	+15	−52
201 B. Sagittarii	5.9	1.74	3.6	26 3.1	6 1 55.1	+ 7 43.0	+0.1991	0.5789	0.1086	+34	−32
ψ Sagittarii	4.9	1.72	3.8	25 24.3	2 51.1	+ 8 36.8	−0.3614	0.5781	0.1111	+ 6	−66
χ Sagittarii	4.9	1.66	3.6	24 40.5	6 46.8	−11 36.6	−0.6550	0.5748	0.1215	− 9	−90
49 Sagittarii	5.5	1.64	3.7	24 7.8	6 52.8	−11 30.9	−1.2032	0.5747	0.1217	−46	−68
51 Sagittarii	5.8	+1.61	−3.0	−24 54.4	11 9.6	− 7 23.9	+0.1391	0.5711	+0.1326	+34	−30
h Sagittarii	4.7	1.61	2.9	25 4.4	11 26.0	− 7 8.1	+0.3469	0.5708	0.1333	+45	−24
53 Sagittarii	6.3	1.57	3.2	23 37.4	12 44.5	− 5 52.5	−0.9722	0.5697	0.1365	−26	−90
274 B. Sagittarii	6.1	1.57	3.2	23 37.5	12 51.7	− 5 45.6	−0.9531	0.5696	0.1368	−25	−90
308 B. Sagittarii	6.3	1.50	2.5	24 9.2	18 45.7	− 0 4.8	+0.4410	0.5644	0.1508	+52	−10
329 B. Sagittarii	6.1	+1.45	−2.4	−22 58.3	21 46.2	+ 2 49.0	−0.3183	0.5617	+0.1575	+13	−63
336 B. Sagittarii	6.5	1.44	2.4	22 50.1	22 46.2	+ 3 46.8	−0.3022	0.5608	0.1597	+14	−62
4 Capricorni	5.7	1.36	2.0	22 4.4	7 4 55.1	+ 9 42.4	−0.0706	0.5552	0.1727	+27	−45
19 Capricorni	5.7	1.13	1.6	18 14.8	21 22.8	+ 1 35.9	−0.9711	0.5407	0.2026	−17	−90
20 Capricorni	6.2	1.12	1.0	19 21.9	23 34.5	+ 3 43.2	+0.6506	0.5388	0.2061	+69	− 9
21 Capricorni	6.5	+1.09	−1.4	−17 51.8	8 0 10.6	+ 4 18.0	−0.8010	0.5383	+0.2070	− 7	−90
θ Capricorni	4.2	1.07	1.3	17 34.3	2 32.1	+ 6 34.8	−0.6154	0.5363	0.2105	+ 4	−85
114 B. Capricorni	6.1	1.02	0.9	17 41.8	6 50.2	+10 44.4	+0.4355	0.5328	0.2167	+60	−20
Uranus	6.0	. . .	. . .	16 58.8	6 51.7	+10 45.9	−0.3138	0.5314	0.2164	+20	−62
31 Capricorni	6.3	1.01	0.7	17 49.2	8 19.6	−11 49.0	+0.8888	0.5316	0.2187	+72	+ 5
ι Capricorni	4.3	+0.98	−0.7	−17 11.8	10 13.8	− 9 58.5	+0.6527	0.5302	+0.2212	+72	− 9
42 Capricorni	5.1	0.86	0.8	14 25.6	19 36.2	− 0 54.0	−0.1440	0.5232	0.2324	+31	−51
44 Capricorni	6.0	0.86	0.6	14 47.3	20 20.6	− 0 11.1	+0.4110	0.5226	0.2332	+61	−21
45 Capricorni	5.8	0.86	0.4	15 8.4	20 48.3	+ 0 15.8	+0.8901	0.5223	0.2337	+75	+ 5
151 B. Capricorni	6.1	0.82	0.8	13 7.2	23 37.3	+ 2 59.6	−0.5875	0.5204	0.2366	+ 9	−82
μ Capricorni	5.2	+0.82	−0.4	−13 57.2	9 1 23.6	+ 4 42.5	+0.7166	0.5192	+0.2383	+76	− 6
e Aquarii	5.4	0.72	0.2	11 59.0	10 9.0	−10 48.0	+0.7474	0.5138	0.2458	+78	− 4
150 B. Aquarii	6.0	0.66	0.7	9 27.8	13 22.0	− 7 40.8	−1.1422	0.5119	0.2483	−23	−90
167 G. Aquarii	6.3	0.57	0.1	8 20.4	10 0 30.7	+ 3 8.3	+0.4613	0.5064	0.2550	+68	−20
67 Aquarii	6.4	0.55	0.1	7 24.5	3 4.8	+ 5 37.9	+0.1205	0.5053	0.2563	+49	−37
252 B. Aquarii	5.8	+0.49	−0.1	− 5 26.4	9 24.7	+11 46.8	−0.3605	0.5028	+0.2587	+24	−64
197 G. Aquarii	6.3	0.48	0.0	5 15.9	10 32.2	−11 7.6	−0.2590	0.5024	0.2591	+30	−59
263 B. Aquarii	6.1	0.46	+0.2	5 10.1	12 48.0	− 8 55.6	+0.2249	0.5017	0.2598	+55	−32
293 B. Aquarii	5.5	0.41	0.4	3 57.6	20 20.9	− 1 35.6	+0.8916	0.4995	0.2614	+86	+ 3
13 Piscium	6.4	0.34	0.7	1 33.3	11 5 14.0	+ 7 2.6	+0.6211	0.4976	0.2619	+83	−12
14 Piscium	5.9	+0.34	+0.8	− 1 43.0	6 25.2	+ 8 11.8	+1.1073	0.4974	+0.2619	+88	+17
λ Piscium	4.6	0.29	0.6	+ 1 18.7	10 44.4	−11 36.2	−1.0436	0.4968	0.2616	−13	−80
21 Piscium	5.6	0.28	1.0	0 36.3	14 46.7	− 7 40.7	+0.7802	0.4965	0.2611	+90	− 3
22 Piscium	5.8	0.26	0.8	2 27.5	16 8.9	− 6 20.7	−0.8752	0.4963	0.2609	− 2	−88
25 Piscium	6.2	+0.26	+1.0	+ 1 37.1	16 45.5	− 5 45.1	+0.1958	0.4962	+0.2608	+54	−33
				NEW	*MOON.*						

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
Arietis (*mean*)	4.6	+0.16	+7.2	+21 0.2	15 18 43.0	− 6 37.2	+0.9826	0.5236	+0.1644	+90	+23
Arietis	5.8	0.22	8.3	24 25.6	16 6 50.7	+ 5 7.5	−0.9587	0.5292	0.1419	−11	−66
Tauri	5.9	0.26	8.4	24 10.9	11 41.6	+ 9 49.1	−0.0233	0.5313	0.1323	+42	−28
Tauri	6.1	0.28	8.7	25 3.5	14 41.0	−11 17.3	−0.6095	0.5326	0.1262	+10	−60
Tauri	5.4	0.30	8.6	24 1.5	16 36.3	− 9 25.8	+0.7769	0.5334	0.1223	+90	+14
Tauri	3.8	+0.31	+8.5	+23 51.0	16 38.5	− 9 23.6	+0.9770	0.5334	+0.1222	+90	+27
Tauri	5.6	0.30	8.7	24 34.6	16 45.9	− 9 16.4	+0.1846	0.5335	0.1219	+55	−17
Tauri	4.3	0.31	8.6	24 12.2	16 47.6	− 9 14.7	+0.6012	0.5335	0.1219	+86	+ 5
Tauri	4.1	0.31	8.6	24 6.3	17 5.2	− 8 57.8	+0.7465	0.5336	0.1213	+90	+13
Tauri	5.8	0.31	8.6	24 17.5	17 7.3	− 8 55.7	+0.5430	0.5336	0.1212	+81	+ 2
Tauri	6.5	+0.31	+8.6	+24 16.0	17 11.3	− 8 51.9	+0.5804	0.5337	+0.1210	+84	+ 4
Tauri	4.3	0.31	8.5	23 41.2	17 19.7	− 8 43.8	+1.2411	0.5337	0.1208	+84	+50
Tauri	3.0	0.32	8.6	23 50.7	17 52.3	− 8 12.2	+1.1299	0.5340	0.1196	+90	+39
Tauri	3.7	0.32	8.6	23 47.8	18 39.8	− 7 26.2	+1.2781	0.5343	0.1180	+76	+56
Tauri	5.2	0.32	8.6	23 52.8	18 40.4	− 7 25.6	+1.1865	0.5343	0.1180	+90	+44
. Tauri	5.3	+0.32	+8.8	+25 19.6	19 10.8	− 6 56.2	−0.3610	0.5345	+0.1169	+23	−45
Tauri	5.6	0.41	9.3	26 15.8	17 4 44.6	+ 2 18.7	−0.3820	0.5382	0.0962	+22	−44
Tauri	5.0	0.46	9.6	27 9.1	9 7.6	+ 6 33.0	−0.9689	0.5397	0.0863	−15	−63
Tauri	5.3	0.47	9.2	25 25.9	10 10.8	+ 7 34.1	+1.0303	0.5401	0.0839	+90	+35
. Aurigæ	6.0	0.63	9.9	27 45.5	23 55.3	− 3 9.3	−0.6198	0.5440	0.0517	+ 8	−56
. Aurigæ	6.5	+0.70	+9.8	+27 34.9	18 5 16.8	+ 2 1.3	−0.1794	0.5452	+0.0388	+33	−27
. Aurigæ	6.0	0.72	9.8	27 55.6	7 34.7	+ 4 14.4	−0.4803	0.5456	0.0332	+16	−45
. Tauri	6.4	0.79	9.8	27 52.5	12 38.2	+ 9 7.5	−0.2856	0.5464	0.0208	+27	−32
Tauri	1.8	0.83	9.8	28 32.4	15 0.1	+11 24.6	−0.9793	0.5467	0.0150	−16	−61
. Aurigæ	6.5	0.88	9.4	27 36.6	19 20.2	− 8 24.3	+0.0913	0.5471	0.0042	+49	− 9
. Aurigæ	5.7	+0.89	+9.2	+26 52.5	19 53.7	− 7 52.0	+0.9073	0.5471	+0.0028	+90	+34
. Tauri	5.6	0.98	9.4	27 56.8	19 2 3.3	− 1 55.1	−0.3077	0.5475	−0.0125	+26	−32
Tauri	4.6	0.99	9.2	27 35.7	3 7.0	− 0 53.6	+0.0649	0.5475	0.0151	+47	−12
. Tauri	6.1	1.04	9.0	27 34.3	6 33.0	+ 2 25.3	+0.0252	0.5475	0.0237	+45	−15
Aurigæ	5.1	1.26	8.3	28 5.5	21 50.2	− 6 49.2	−1.1963	0.5464	0.0614	−38	−62
Geminorum	5.7	+1.36	+6.8	+25 29.1	20 6 55.6	+ 1 57.4	+1.0077	0.5449	−0.0832	+90	+33
Geminorum	6.2	1.39	6.9	26 11.7	8 29.4	+ 3 28.0	+0.0959	0.5446	0.0869	+49	−17
Geminorum	6.3	1.39	6.8	26 1.9	8 47.4	+ 3 45.4	+0.2484	0.5445	0.0876	+59	−10
Geminorum	6.1	1.48	5.8	25 2.1	15 41.9	+10 25.8	+0.6762	0.5430	0.1037	+90	+11
Geminorum	5.1	1.53	5.6	25 13.0	19 41.4	− 9 42.9	+0.0456	0.5420	0.1129	+46	−22
. Geminorum	6.3	+1.62	+4.6	+24 33.2	21 2 26.7	− 3 11.3	−0.0453	0.5403	−0.1279	+41	−29
. Geminorum	6.0	1.62	4.6	24 25.0	2 53.2	− 2 45.7	+0.0453	0.5402	0.1289	+46	−24
. Geminorum	6.3	1.61	4.1	23 13.0	3 43.3	− 1 57.3	+1.2402	0.5399	0.1307	+84	+49
Geminorum	3.7	1.65	4.4	24 36.2	5 17.7	− 0 26.0	−0.4742	0.5395	0.1341	+17	−53
Geminorum	6.3	1.66	3.8	23 21.2	7 12.4	+ 1 24.8	+0.6225	0.5389	0.1382	+88	+ 4
. Cancri	6.4	+1.74	+3.3	+23 49.1	12 57.3	+ 6 58.1	−0.7107	0.5373	−0.1503	+ 4	−66
Cancri	6.2	1.76	2.7	22 52.8	15 25.5	+ 9 21.4	−0.0732	0.5366	0.1554	+39	−33
Cancri	5.5	1.75	2.2	21 49.8	16 7.1	+10 1.6	+0.9523	0.5363	0.1568	+90	+22
. Cancri	6.4	1.81	2.5	23 23.7	18 51.6	−11 19.3	−1.1740	0.5355	0.1623	−30	−67
. Cancri	6.0	1.82	1.3	21 1.0	22 0.1	− 8 17.0	+0.8687	0.5346	0.1685	+90	+15
Cancri	5.5	+1.88	+0.5	+20 43.8	22 3 48.9	− 2 39.6	+0.1623	0.5329	−0.1796	+53	−24
Cancri	6.5	1.92	0.0	20 18.5	7 18.8	+ 0 43.4	−0.0247	0.5319	0.1860	+42	−34
Cancri	6.5	1.92	0.0	20 16.3	7 21.3	+ 0 45.9	+0.0066	0.5319	0.1861	+44	−32
B. Cancri	6.5	1.91	−0.2	19 58.3	7 26.5	+ 0 50.9	+0.3128	0.5319	0.1862	+62	−17
Cancri	6.3	1.91	0.2	19 50.8	7 29.0	+ 0 53.3	+0.4390	0.5319	0.1863	+71	−11
B. Cancri	6.1	+1.96	−1.1	+19 9.0	12 22.6	+ 5 37.4	+0.2490	0.5305	−0.1950	+58	−21
B. Cancri	6.4	2.06	4.0	15 43.9	23 3 1.6	− 4 11.9	+0.8415	0.5270	0.2188	+90	+ 7
B. Leonis	6.3	2.10	3.8	16 57.1	5 5.0	− 2 12.5	−0.9018	0.5266	0.2219	− 6	−73
Leonis	6.2	2.12	5.2	14 45.5	10 6.3	+ 2 39.3	+0.2808	0.5258	0.2290	+59	−24
Leonis	6.5	2.13	5.3	14 43.8	11 8.6	+ 3 39.6	+0.0710	0.5256	0.2305	+47	−34
Leonis	5.6	+2.15	−5.7	+14 24.6	13 54.9	+ 6 20.7	−0.2350	0.5252	−0.2342	+31	−51

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. $\Delta\alpha$	Red'ns from 1915.0. $\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
ν Leonis	5.0	+2.20	− 7.1	+12 50.9	**23** 20 58.8	−10 48.9	+0.2852	0.5244	−0.2432	+29	−55
A Leonis	4.6	2.20	8.4	10 24.7	**24** 1 43.4	− 6 13.1	+1.0895	0.5241	0.2486	+90	+19
α Leonis	1.3	2.23	7.8	12 22.9	1 56.6	− 6 0.4	−1.0164	0.5240	0.2489	−12	−78
44 Leonis	5.9	2.27	9.8	9 12.9	10 11.8	+ 1 59.3	+0.1848	0.5240	0.2574	+54	−32
45 Leonis	5.8	2.29	9.6	10 11.6	11 21.6	+ 3 6.9	−1.1285	0.5240	0.2585	−20	−80
ρ Leonis	3.8	+2.31	−10.0	+ 9 44.5	13 53.0	+ 5 33.5	−1.3144	0.5240	−0.2608	−37	−80
48 Leonis	5.2	2.28	10.8	7 23.3	14 52.4	+ 6 31.0	+0.8576	0.5242	0.2617	+90	+ 3
49 Leonis	5.7	2.31	10.3	9 5.2	14 58.6	+ 6 37.1	−0.9230	0.5242	0.2618	− 6	−81
37 Sextantis	6.3	2.32	11.6	6 49.1	20 22.7	+11 50.9	−0.0097	0.5247	0.2662	+43	−43
56 Leonis	6.1	2.36	12.1	6 38.2	**25** 1 12.7	− 7 28.3	−1.1158	0.5253	0.2696	−18	−83
d Leonis	5.0	+2.35	−13.0	+ 4 4.2	3 25.5	− 5 19.6	+0.9144	0.5258	−0.2709	+90	+ 5
75 Leonis	5.4	2.40	14.3	2 28.5	11 31.2	+ 2 30.6	+0.3283	0.5276	0.2752	+62	−26
76 Leonis	6.0	2.40	14.4	2 6.8	12 18.5	+ 3 16.4	+0.4788	0.5278	0.2756	+72	−19
79 Leonis	5.5	2.42	14.7	+ 1 52.2	14 46.3	+ 5 39.5	+0.0446	0.5286	0.2765	+46	−41
υ Leonis	4.5	2.44	15.7	− 0 21.5	20 57.2	+11 38.5	+0.5878	0.5306	0.2783	+80	−13
78 B. Virginis	6.5	+2.53	−17.9	− 5 15.1	**26** 14 29.6	+ 4 36.6	+0.6128	0.5388	−0.2781	+81	−12
χ Virginis	4.8	2.61	18.8	7 32.0	**27** 1 54.4	− 8 21.8	−0.2634	0.5458	0.2735	+28	−58
ψ Virginis	5.0	2.65	19.3	9 5.0	8 39.3	− 1 50.9	−0.5547	0.5505	0.2690	+13	−78
49 Virginis	5.2	2.69	19.5	10 17.5	14 36.4	+ 3 53.7	−0.9421	0.5549	0.2638	− 9	−90
i Virginis	5.7	2.74	19.8	12 16.3	22 43.4	+11 43.2	−1.0912	0.5614	0.2549	−21	−90
75 Virginis	5.6	+2.76	−19.9	−14 55.9	**28** 1 18.9	− 9 47.0	+0.8742	0.5636	−0.2516	+75	+ 4
83 Virginis	5.6	2.80	19.9	15 45.4	6 11.7	− 5 5.0	+0.4751	0.5676	0.2447	+64	−18
85 Virginis	6.1	2.80	19.8	15 20.8	6 39.2	− 4 38.5	−0.0413	0.5680	0.2440	+35	−46
43 H. Virginis	5.5	2.88	19.4	17 48.6	18 49.5	+ 7 4.1	−0.4699	0.5786	0.2231	+11	−73
231 G. Virginis	6.4	2.88	19.4	18 11.8	19 29.2	+ 7 42.3	−0.2385	0.5793	0.2218	+22	−57
236 G. Virginis	5.7	+2.89	−19.4	−18 19.7	20 7.1	+ 8 18.7	−0.2489	0.5797	−0.2206	+22	−58
9 G. Libræ	6.5	2.94	18.9	20 4.3	**29** 2 31.2	− 9 32.2	+0.0904	0.5852	0.2072	+38	−38
17 G. Libræ	6.4	2.96	18.6	20 49.3	6 56.1	− 5 17.9	−0.0685	0.5889	0.1971	+28	−47
18 G. Libræ	6.1	2.96	18.5	20 58.4	7 20.2	− 4 54.7	+0.0022	0.5892	0.1961	+32	−43
43 B. Libræ	5.7	3.00	18.8	21 2.3	11 14.3	− 1 10.1	−0.6814	0.5923	0.1866	− 4	−90
47 G. Libræ	6.1	+3.00	−17.8	−21 42.4	14 41.6	+ 2 8.7	−0.6572	0.5950	−0.1778	− 4	−90
64 G. Libræ	5.8	3.02	17.4	22 5.4	18 26.6	+ 5 44.4	−0.9300	0.5978	0.1678	−21	−90
153 B. Libræ	6.3	3.06	16.4	24 12.4	**30** 0 40.6	+11 42.7	+0.1498	0.6021	0.1502	+35	−35
42 Libræ	5.0	3.06	16.2	23 32.8	3 19.2	− 9 45.4	−0.8826	0.6037	0.1424	−21	−90
b Scorpii	4.7	3.09	15.4	25 29.9	7 13.4	− 6 1.1	+0.4961	0.6059	0.1306	+53	−16
A Scorpii	4.6	+3.09	−15.3	−25 4.7	8 11.5	− 5 5.6	−0.0403	0.6064	−0.1276	+23	−46
31 B. Scorpii	5.4	3.08	15.3	24 17.1	8 18.3	− 4 59.0	−0.8326	0.6065	0.1273	−19	−90
3 Scorpii	5.9	3.09	15.2	24 59.8	8 34.4	− 4 43.6	−0.1689	0.6066	0.1264	+16	−54
4 Scorpii	5.7	3.10	15.1	26 1.2	8 52.2	− 4 26.5	+0.7975	0.6068	0.1255	+64	+ 2
40 B. Scorpii	5.4	3.08	15.1	24 35.5	10 0.5	− 3 21.2	−0.7450	0.6074	0.1219	−14	−90
π Scorpii	3.0	+3.10	−14.9	−25 52.5	10 5.5	− 3 16.4	+0.5035	0.6074	−0.1217	+53	−15
48 B. Scorpii	4.9	3.10	14.7	25 38.0	11 43.8	− 1 42.4	+0.0719	0.6081	0.1165	+28	−39
50 B. Scorpii	6.4	3.08	14.8	24 29.8	11 56.9	− 1 29.8	−1.0683	0.6082	0.1158	−36	−90
65 B. Scorpii	5.5	3.11	14.4	26 6.2	13 27.1	− 0 3.5	+0.3374	0.6089	0.1110	+41	−25
85 B. Scorpii	6.0	3.09	14.1	25 15.9	15 54.8	+ 2 17.8	−0.7482	0.6099	0.1030	−16	−90
σ Scorpii	3.1	+3.09	−13.7	−25 23.6	18 10.9	+ 4 28.0	−0.8484	0.6107	−0.0956	−23	−90
α Scorpii	1.2	3.10	13.1	26 14.9	21 7.5	+ 7 17.0	−0.2761	0.6116	0.0858	+ 7	−60
116 B. Scorpii	6.2	+3.11	−12.9	−26 21.4	21 50.0	+ 7 57.6	−0.2287	0.6117	−0.0834	+ 9	−57

MAY.

Name.	Mag.	$\Delta\alpha$	$\Delta\delta$	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
134 B. Scorpii	6.4	+3.11	−12.0	−27 18.0	**1** 2 26.6	−11 37.9	+0.3514	0.6127	−0.0678	+39	−24
118 B. Ophiuchi	6.2	3.07	10.7	26 24.1	10 31.7	− 3 54.1	−0.9715	0.6131	0.0399	−35	−90
95 G. Ophiuchi	6.1	3.08	10.0	27 39.6	12 29.3	− 2 1.5	+0.2000	0.6129	0.0331	+28	−32
36 Oph. (1*st star*)	5.4	3.04	10.4	26 28.9	13 34.1	− 0 59.7	−0.9990	0.6128	0.0294	−38	−90
43 Ophiuchi	5.4	+3.08	− 9.2	−28 3.8	16 23.6	+ 1 42.4	+0.4964	0.6124	−0.0196	+44	−15

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
. Ophiuchi	6.3	+3.03	−7.8	−27 50.8	1 23 33.1	+ 8 33.2	+0.2299	0.6104	+0.0051	+27	−30
Sagittarii (*var.*)	4.4	3.02	7.5	27 48.1	2 1 5.4	+10 1.5	+0.1975	0.6099	0.0103	+25	−32
. Sagittarii	6.2	2.99	7.7	26 56.9	1 25.7	+10 20.8	−0.6469	0.6098	0.0115	−18	−90
. Sagittarii	5.7	3.00	6.8	28 3.2	4 23.3	−10 49.3	+0.5020	0.6085	0.0216	+44	−15
. Scorpii	5.8	3.01	6.4	28 45.1	5 5.3	−10 9.1	+1.2130	0.6082	0.0239	+61	+41
. Sagittarii	4.7	+2.97	−5.8	−28 28.1	8 31.3	− 6 51.9	+1.0348	0.6064	+0.0355	+62	+21
. Sagittarii	6.3	2.94	5.3	28 19.1	11 55.7	− 3 36.3	+1.0261	0.6045	0.0466	+62	+20
. Sagittarii	4.7	2.91	5.5	27 4.5	12 11.6	− 3 21.1	−0.2025	0.6043	0.0476	+ 8	−56
. Sagittarii	6.1	2.93	4.8	28 28.2	13 37.6	− 1 58.8	+1.2637	0.6034	0.0522	+62	+52
. Sagittarii	6.2	2.86	4.9	26 41.2	15 46.1	+ 0 4.3	−0.4005	0.6020	0.0592	− 1	−69
. Sagittarii	6.3	+2.87	−4.8	−26 48.6	15 54.4	+ 0 12.3	−0.2694	0.6019	+0.0596	+ 5	−60
. Sagittarii	6.5	2.86	4.8	26 38.3	16 13.3	+ 0 30.4	−0.4228	0.6017	0.0606	− 2	−71
Sagittarii	3.3	2.81	3.5	27 4.8	22 27.0	+ 6 28.4	+0.4588	0.5971	0.0800	+46	−18
Sagittarii	2.1	2.75	3.0	26 24.3	3 2 5.7	+ 9 58.1	+0.0917	0.5941	0.0910	+27	−38
. Sagittarii	6.4	2.70	3.2	24 59.5	3 17.3	+11 6.7	−1.2202	0.5931	0.0946	−51	−85
. Sagittarii	6.4	+2.70	−3.0	−25 3.7	4 4.6	+11 52.2	−1.0747	0.5924	+0.0969	−37	−90
. Sagittarii	5.8	2.68	2.9	24 57.9	4 51.8	−11 22.6	−1.0949	0.5918	0.0992	−39	−90
. Sagittarii	6.1	2.66	2.6	24 47.5	7 5.2	− 9 14.6	−1.0444	0.5897	0.1056	−34	−90
3. Sagittarii	5.9	2.66	1.8	26 3.0	8 59.8	− 7 24.6	+0.4340	0.5880	0.1110	+47	−19
Sagittarii	4.9	2.64	1.9	25 24.3	9 54.2	− 6 32.5	−0.1174	0.5871	0.1135	+18	−50
3. Sagittarii	6.1	+2.62	−2.2	−24 19.5	9 55.3	− 6 31.4	−1.2067	0.5871	+0.1135	−48	−88
Sagittarii	4.9	2.58	1.4	24 40.5	13 43.4	− 2 52.3	−0.4034	0.5835	0.1238	+ 5	−69
Sagittarii	5.5	2.56	1.6	24 7.8	13 49.2	− 2 46.8	−0.9436	0.5834	0.1241	−26	−90
Sagittarii	5.8	2.53	0.6	24 54.4	17 59.2	+ 1 13.4	+0.3831	0.5794	0.1350	+47	−22
Sagittarii	4.7	2.53	0.5	25 4.3	18 15.2	+ 1 28.7	+0.5882	0.5791	0.1356	+59	−11
Sagittarii	6.3	+2.48	−0.7	−23 37.3	19 31.6	+ 2 42.1	−0.7116	0.5778	+0.1388	−10	−90
3. Sagittarii	6.1	2.48	−0.7	23 37.5	19 38.6	+ 2 48.8	−0.6926	0.5777	0.1391	− 9	−90
3. Sagittarii	6.3	2.42	+0.3	24 9.2	4 1 23.8	+ 8 20.8	+0.6868	0.5718	0.1530	+65	− 5
3. Sagittarii	6.1	2.36	0.5	22 58.3	4 20.1	+11 10.4	−0.0607	0.5688	0.1597	+26	−47
B. Sagittarii	6.5	2.34	0.7	22 50.1	5 18.6	−11 53.2	−0.0441	0.5678	0.1619	+27	−46
Capricorni	5.7	+2.26	+1.3	−22 4.4	11 19.4	− 6 5.8	+0.1880	0.5615	+0.1747	+40	−33
B. Capricorni	6.4	2.01	2.0	18 21.0	5 1 1.5	+ 7 7.0	−1.0844	0.5475	0.2000	−27	−90
Capricorni	5.7	1.98	2.3	18 14.7	3 28.7	+ 9 29.2	−0.6984	0.5451	0.2039	− 1	−90
Capricorni	6.2	1.98	3.0	19 21.9	5 38.2	+11 34.2	+0.9081	0.5430	0.2073	+71	+ 7
Capricorni	6.5	1.94	2.5	17 51.7	6 13.8	−11 51.4	−0.5300	0.5424	0.2082	+ 8	−77
Capricorni	4.2	+1.91	+2.7	−17 34.2	8 33.2	− 9 36.7	−0.3461	0.5402	+0.2117	+18	−64
B. Capricorni	6.1	1.86	3.3	17 41.8	12 47.7	− 5 30.7	+0.6955	0.5362	0.2175	+72	− 6
URANUS	6.0	. . .	. . .	16 48.5	14 0.1	− 4 20.6	+0.0329	0.5346	0.2190	+38	−42
Capricorni	6.3	1.85	3.5	17 49.1	14 15.9	− 4 5.4	+1.1451	0.5348	0.2195	+72	+24
Capricorni	4.3	1.81	3.5	17 11.8	16 8.7	− 2 16.2	+0.9109	0.5331	0.2219	+73	+ 7
Capricorni	5.1	+1.66	+3.5	−14 25.6	6 1 25.1	+ 6 42.2	+0.1179	0.5252	+0.2325	+45	−37
Capricorni	6.0	1.66	3.8	14 47.3	2 9.1	+ 7 24.9	+0.6690	0.5246	0.2333	+75	− 8
Capricorni	5.8	1.66	4.0	15 8.3	2 36.5	+ 7 51.4	+1.1448	0.5242	0.2337	+75	+22
B. Capricorni	6.1	1.60	3.6	13 7.1	5 24.1	+10 33.8	−0.3247	0.5220	0.2365	+23	−62
Capricorni	5.2	1.60	4.0	13 57.1	7 9.5	−11 44.1	+0.9709	0.5207	0.2381	+76	+10
Aquarii	5.4	+1.47	+4.2	−11 58.9	15 51.6	− 3 18.0	+0.9968	0.5145	+0.2452	+78	+11
B. Aquarii	6.0	1.41	3.7	9 27.8	19 3.7	− 0 11.7	−0.8872	0.5124	0.2474	− 5	−90
G. Aquarii	6.3	1.28	4.3	8 20.3	7 6 10.5	+10 35.4	+0.6997	0.5060	0.2535	+82	− 7
Aquarii	6.4	1.25	4.2	7 24.4	8 44.4	−10 55.2	+0.3570	0.5048	0.2546	+63	−25
B. Aquarii	5.8	1.17	4.1	5 26.4	15 4.2	− 4 46.3	−0.1310	0.5019	0.2568	+36	−50
G. Aquarii	6.3	+1.15	+4.2	− 5 15.8	16 11.7	− 3 40.7	−0.0312	0.5015	+0.2571	+41	−45
B. Aquarii	6.1	1.13	4.3	5 10.0	18 27.6	− 1 28.7	+0.4490	0.5006	0.2576	+69	−20
B. Aquarii	5.5	1.05	4.6	3 57.5	8 2 1.3	+ 5 52.2	+1.1042	0.4980	0.2589	+86	+17
Piscium	6.4	0.96	4.5	1 33.2	10 55.9	− 9 28.1	+0.8197	0.4959	0.2592	+88	− 1
Piscium	5.9	0.95	4.6	− 1 42.9	12 7.4	− 8 18.6	+1.3040	0.4957	0.2592	+88	+35
Piscium	4.6	+0.88	+4.0	+ 1 18.8	16 27.6	− 4 5.6	−0.8553	0.4949	+0.2588	− 2	−89

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
21 Piscium	5.6	+0.86	+ 4.6	+ 0 36.3	8 20 31.0	− 0 8.9	+0.9620	0.4945	+0.2582	+90	+ 7
22 Piscium	5.8	0.84	4.1	2 27.5	21 53.6	+ 1 11.4	−0.6973	0.4944	0.2579	+ 7	−88
25 Piscium	6.2	0.84	4.4	1 37.2	22 30.3	+ 1 47.1	+0.3734	0.4944	0.2578	+65	−24
51 Piscium	5.6	0.66	4.7	6 29.3	9 20 7.0	− 1 12.0	+0.5579	0.4950	0.2496	+78	−14
136 B. Piscium	6.5	0.61	4.4	8 53.6	10 0 56.4	+ 3 29.5	−0.8816	0.4958	0.2468	− 3	−81
η Piscium	3.7	+0.44	+ 5.1	+14 54.6	4 3.3	+ 5 50.7	−1.0964	0.5034	+0.2245	−19	−75
101 Piscium	6.2	0.44	5.3	14 13.7	6 20.2	+ 8 3.6	+0.1653	0.5043	0.2222	+53	−30
105 Piscium	6.1	0.42	5.2	15 58.6	8 23.1	+10 3.0	−1.3140	0.5051	0.2199	−41	−74
				NEW	*MOON.*						
38 B. Aurigæ	6.5	+0.59	+ 8.4	+27 34.8	15 11 25.2	+ 9 57.2	−0.3454	0.5468	+0.0371	+24	−37
47 B. Aurigæ	6.0	0.61	8.4	27 55.6	13 43.1	−11 49.6	−0.6509	0.5472	0.0315	+ 6	−57
354 B. Tauri	6.4	0.65	8.4	27 52.5	18 46.7	− 6 56.5	−0.4648	0.5479	0.0191	+17	−43
β Tauri	1.8	0.68	8.4	28 32.3	21 8.7	− 4 39.3	−1.1640	0.5482	0.0133	−35	−61
107 B. Aurigæ	6.5	0.71	8.2	27 36.6	16 1 29.1	− 0 28.0	−0.0984	0.5484	0.0026	+38	−20
112 B. Aurigæ	5.7	+0.71	+ 8.1	+26 52.5	2 2.7	+ 0 4.5	+0.7186	0.5485	+0.0012	+90	+23
406 B. Tauri	5.6	0.77	8.2	27 56.7	8 13.0	+ 6 2.0	−0.5094	0.5486	−0.0141	+14	−45
136 Tauri	4.6	0.78	8.0	27 35.7	9 16.9	+ 7 3.7	−0.1375	0.5486	0.0167	+35	−23
415 B. Tauri	6.1	0.82	8.0	27 34.3	12 43.4	+10 23.1	−0.1828	0.5484	0.0253	+33	−26
37 Geminorum	5.7	1.06	6.3	25 29.1	17 13 13.4	+10 2.8	+0.7689	0.5445	0.0843	+90	+18
39 Geminorum	6.2	+1.08	+ 6.4	+26 11.7	14 47.9	+11 34.0	−0.1494	0.5440	−0.0880	+35	−30
40 Geminorum	6.3	1.09	6.3	26 1.9	15 6.1	+11 51.7	+0.0035	0.5439	0.0887	+44	−22
52 Geminorum	6.1	1.16	5.6	25 2.1	22 4.3	− 5 24.3	+0.4249	0.5419	0.1046	+71	− 2
A Geminorum	5.1	1.20	5.4	25 13.0	18 2 6.2	− 1 30.6	−0.2140	0.5406	0.1136	+31	−36
176 B. Geminorum	6.3	1.27	4.6	24 33.2	8 56.1	+ 5 5.7	−0.3133	0.5383	0.1284	+26	−43
181 B. Geminorum	6.0	+1.28	+ 4.6	+24 25.0	9 23.0	+ 5 31.6	−0.2227	0.5382	−0.1294	+31	−38
187 B. Geminorum	6.3	1.27	4.2	23 13.0	10 13.7	+ 6 20.7	+0.9795	0.5379	0.1312	+90	+26
κ Geminorum	3.7	1.30	4.4	24 36.2	11 49.3	+ 7 53.1	−0.7483	0.5373	0.1345	+ 1	−65
82 Geminorum	6.3	1.31	3.9	23 21.2	13 45.5	+ 9 45.5	+0.3541	0.5366	0.1385	+65	−10
5 B. Cancri	6.4	1.38	3.5	23 49.1	19 35.4	− 8 36.2	−0.9950	0.5345	0.1503	−15	−60
9 Cancri	6.2	+1.40	+ 3.0	+22 52.8	22 5.8	− 6 10.7	−0.3547	0.5335	−0.1552	+24	−48
μ Cancri	5.5	1.40	2.6	21 49.8	22 48.1	− 5 29.8	+0.6785	0.5333	0.1566	+90	+ 5
49 B. Cancri	6.0	1.45	1.8	21 1.0	19 4 47.0	+ 0 17.5	+0.5897	0.5310	0.1680	+84	− 1
η Cancri	5.5	1.51	1.2	20 43.9	10 42.2	+ 6 1.3	−0.1270	0.5288	0.1787	+37	−30
39 Cancri	6.5	1.55	0.8	20 18.5	14 16.2	+ 9 28.4	−0.3182	0.5275	0.1849	+26	−50
40 Cancri	6.5	+1.55	+ 0.7	+20 16.3	14 18.7	+ 9 30.9	−0.2866	0.5275	−0.1850	+28	−48
102 B. Cancri	6.5	1.54	0.6	19 58.3	14 24.0	+ 9 36.0	+0.0226	0.5274	0.1851	+45	−32
ε Cancri	6.3	1.54	+ 0.6	19 50.8	14 26.6	+ 9 38.5	+0.1499	0.5274	0.1852	+52	−25
δ Cancri	4.2	1.55	− 0.2	18 28.0	16 30.4	+11 38.3	+1.2538	0.5267	0.1887	+88	+42
139 B. Cancri	6.1	1.59	0.1	19 9.0	19 26.3	− 9 31.3	−0.0445	0.5257	0.1935	+41	−36
X Cancri (*var.*)	6.2	+1.59	− 0.9	+17 33.3	21 42.6	− 7 19.3	+1.2303	0.5249	−0.1972	+90	+35
227 B. Cancri	6.4	1.70	2.8	15 43.9	20 10 25.7	+ 4 59.9	+0.5504	0.5210	0.2163	+79	− 9
12 B. Leonis	6.3	1.74	2.6	16 57.1	12 32.1	+ 7 2.4	−1.2140	0.5205	0.2192	−30	−73
7 Leonis	6.2	1.77	3.9	14 45.5	17 41.2	−11 58.1	−0.0173	0.5192	0.2261	+43	−39
11 Leonis	6.5	1.78	4.0	14 43.9	18 45.2	−10 56.0	−0.2296	0.5190	0.2274	+31	−50
ψ Leonis	5.6	+1.81	− 4.4	+14 24.6	21 35.9	− 8 10.6	−0.5392	0.5184	−0.2310	+15	−60
ν Leonis	5.0	1.86	5.7	12 50.9	21 4 51.6	− 1 8.3	−0.5886	0.5172	0.2394	+13	−73
A Leonis	4.6	1.88	7.1	10 24.8	9 44.4	+ 3 35.6	+0.8065	0.5166	0.2446	+90	+ 1
α Leonis	1.3	1.90	6.4	12 22.9	9 58.0	+ 3 48.7	−1.3278	0.5166	0.2448	−40	−78
44 Leonis	5.9	1.96	8.4	9 12.9	18 27.9	−11 56.9	−0.1053	0.5161	0.2529	+38	−47
48 Leonis	5.2	+1.98	− 9.4	+ 7 23.3	23 16.9	− 7 16.7	+0.5808	0.5162	−0.2569	+80	−12
49 Leonis	5.7	2.00	8.8	9 5.2	23 23.3	− 7 10.5	−1.2247	0.5162	0.2570	−28	−81
37 Sextantis	6.3	2.03	10.2	6 49.1	22 4 57.4	− 1 46.5	−0.2933	0.5165	0.2611	+28	−59
56 Leonis	6.1	2.08	10.7	6 38.2	9 56.4	+ 3 3.4	−1.4097	0.5171	0.2642	−52	−73
d Leonis	5.0	2.08	11.8	4 4.2	12 13.2	+ 5 16.0	+0.6523	0.5175	0.2656	+86	− 9
75 Leonis	5.4	+2.15	−13.0	+ 2 28.5	20 33.9	−10 38.7	+0.0693	0.5193	−0.2695	+47	−39

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
Leonis	6.0	+2.15	−13.2	+ 2 6.8	**22** 21 22.7	− 9 51.4	+0.2231	0.5195	−0.2698	+56	−32
Leonis	6.3	2.16	13.9	0 35.7	23 33.4	− 7 44.7	+1.1990	0.5203	0.2706	+90	+24
Leonis	5.5	2.18	13.5	+ 1 52.2	23 55.1	− 7 23.7	−0.2134	0.5202	0.2707	+32	−55
Leonis	4.5	2.22	14.7	− 0 21.5	**23** 6 17.2	− 1 13.5	+0.3481	0.5224	0.2724	+63	−25
Virginis	6.5	2.38	17.3	5 15.1	**24** 0 19.7	− 7 45.2	+0.4089	0.5313	0.2723	+66	−22
Virginis	4.8	+2.50	−18.5	− 7 32.0	12 1.9	+ 3 33.9	−0.4506	0.5389	−0.2678	+19	−70
Virginis	6.0	2.57	19.7	11 11.6	18 55.0	+10 13.1	+1.3927	0.5440	0.2635	+72	+50
Virginis	5.0	2.58	19.1	9 5.0	18 56.2	+10 14.2	−0.7273	0.5440	0.2635	+ 3	−90
Virginis	5.2	2.65	19.5	10 17.5	**25** 1 0.8	− 7 53.7	−1.1019	0.5490	0.2586	−21	−90
Virginis	5.7	2.74	20.0	12 16.3	9 16.8	+ 0 4.8	−1.2285	0.5563	0.2500	−33	−90
Virginis	5.6	+2.77	−20.6	−14 55.9	11 54.9	+ 2 37.3	+0.7602	0.5587	−0.2469	+75	− 3
Virginis	5.6	2.84	20.6	15 45.5	16 52.0	+ 7 23.6	+0.3715	0.5634	0.2403	+58	−24
Virginis	6.1	2.84	20.5	15 20.8	17 19.9	+ 7 50.4	−0.1472	0.5639	0.2396	+30	−52
Virginis	5.5	3.00	20.4	17 48.6	**26** 5 38.4	− 4 18.8	−0.5426	0.5760	0.2193	+ 7	−78
Virginis	6.4	3.01	20.4	18 11.8	6 18.5	− 3 40.2	−0.3082	0.5766	0.2181	+19	−61
Virginis	5.7	+3.02	−20.4	−18 19.7	6 56.7	− 3 3.5	−0.3168	0.5773	−0.2169	+18	−62
Libræ	6.5	3.11	20.2	20 4.3	13 23.3	+ 3 8.1	+0.0422	0.5837	0.2039	+35	−41
Libræ	6.4	3.17	20.0	20 49.3	17 49.3	+ 7 23.5	−0.1044	0.5880	0.1940	+27	−49
Libræ	6.1	3.17	19.9	20 58.5	18 13.5	+ 7 46.8	−0.0326	0.5884	0.1931	+30	−45
Libræ	5.7	3.25	20.2	21 2.3	22 8.0	+11 31.7	−0.7057	0.5921	0.1838	− 6	−90
Libræ	6.1	+3.27	−19.2	−21 42.4	**27** 1 35.4	− 9 9.2	−0.6714	0.5954	−0.1751	− 5	−90
Libræ	5.8	3.31	18.7	22 5.4	5 20.1	− 5 33.8	−0.9329	0.5988	0.1653	−22	−90
Libræ	6.3	3.41	18.0	24 12.4	11 32.8	+ 0 23.2	+0.1632	0.6040	0.1479	+35	−34
Libræ	5.0	3.42	17.6	23 32.8	14 10.5	+ 2 54.2	−0.8596	0.6060	0.1402	−20	−90
Scorpii	4.7	3.49	17.0	25 29.9	18 3.1	+ 6 36.9	+0.5257	0.6088	0.1285	+54	−14
Scorpii	4.6	+3.49	−16.8	−25 4.7	19 0.7	+ 7 31.9	−0.0064	0.6095	−0.1255	+25	−44
Scorpii	5.4	3.47	16.8	24 17.1	19 7.5	+ 7 38.4	−0.7956	0.6096	0.1252	−17	−90
Scorpii	5.9	3.49	16.7	24 59.8	19 23.5	+ 7 53.8	−0.1335	0.6097	0.1244	+18	−51
Scorpii	5.7	3.51	16.7	26 1.2	19 41.1	+ 8 10.6	+0.8300	0.6099	0.1234	+64	+ 4
Scorpii	5.4	3.49	16.4	24 35.5	20 48.8	+ 9 15.4	−0.7036	0.6107	0.1199	−12	−90
Scorpii	3.0	+3.52	−16.5	−25 52.5	20 53.7	+ 9 20.0	+0.5403	0.6107	−0.1197	+54	−13
Scorpii	4.9	3.52	16.2	25 38.0	22 31.1	+10 53.2	+0.1146	0.6117	0.1145	+31	−37
Scorpii	6.4	3.51	16.1	24 29.8	22 44.1	+11 5.6	−1.0202	0.6119	0.1138	−33	−90
Scorpii	5.5	3.55	15.8	26 6.2	**28** 0 13.4	−11 29.0	+0.3833	0.6127	0.1090	+44	−22
Scorpii	6.0	3.55	15.4	25 16.0	2 39.4	− 9 9.4	−0.6905	0.6141	0.1011	−13	−90
Scorpii	3.1	+3.57	−15.0	−25 23.6	4 53.9	− 7 0.8	−0.7840	0.6152	−0.0936	−19	−90
Scorpii	1.2	3.60	14.4	26 14.9	7 48.2	− 4 14.2	−0.2073	0.6165	0.0839	+10	−56
Scorpii	6.2	3.61	14.2	26 21.4	8 30.1	− 3 34.1	−0.1584	0.6168	0.0815	+13	−53
Scorpii	6.4	3.66	13.2	27 18.1	13 2.7	+ 0 46.3	+0.4291	0.6183	0.0659	+43	−19
Ophiuchi	6.2	3.67	11.4	26 24.1	20 59.4	+ 8 21.7	−0.8632	0.6198	0.0379	−29	−90
Ophiuchi	6.1	+3.70	−10.9	−27 39.6	22 54.7	+10 11.9	+0.3026	0.6199	−0.0311	+33	−26
Ophi. (*1st star*)	5.4	3.66	11.2	26 28.9	23 58.3	+11 12.6	−0.8826	0.6200	0.0273	−30	−90
Ophiuchi	5.4	3.72	9.9	28 3.9	**29** 2 44.4	−10 8.7	+0.6053	0.6199	0.0175	+52	− 9
Ophiuchi	6.0	3.67	9.3	26 12.5	5 42.3	− 7 18.7	−1.2510	0.6195	−0.0069	−61	−76
G. Ophiuchi	6.3	3.72	8.2	27 50.8	9 44.5	− 3 27.3	+0.3575	0.6187	+0.0075	+35	−23
Sagittarii (*var.*)	4.4	+3.72	− 7.8	−27 48.1	11 14.7	− 2 1.2	+0.3290	0.6182	+0.0128	+34	−25
G. Sagittarii	6.2	3.69	7.8	26 56.9	11 34.5	− 1 42.2	−0.5054	0.6181	0.0139	+11	−78
G. Sagittarii	5.7	3.72	6.9	28 3.2	14 27.9	+ 1 3.5	+0.6371	0.6172	0.0241	+55	− 7
B. Sagittarii	4.7	3.72	5.9	28 28.1	18 29.8	+ 4 54.6	+1.1722	0.6154	0.0381	+61	+35
G. Sagittarii	6.3	3.71	5.1	28 19.1	21 48.9	+ 8 5.0	+1.1706	0.6137	0.0495	+62	+35
B. Sagittarii	4.7	+3.67	− 5.1	−27 4.5	22 4.4	+ 8 19.8	−0.0421	0.6135	+0.0504	+16	−46
G. Sagittarii	6.2	3.64	4.3	26 41.2	**30** 1 33.3	+11 39.6	−0.2298	0.6114	0.0621	+ 8	−57
G. Sagittarii	6.3	3.65	4 2	26 48.6	1 41.3	+11 47.2	−0.1001	0.6114	0.0625	+14	−49
B. Sagittarii	6.5	3.64	4.2	26 38.3	1 59.7	−11 55.2	−0.2508	0.6112	0.0635	+ 7	−59
Sagittarii	3.3	3.62	2.6	27 4.8	8 3.1	− 6 7.5	+0.6319	0.6069	0.0833	+58	− 7
Sagittarii	2.1	+3.57	− 1.8	−26 24.2	11 35.6	− 2 44.1	+0.2771	0.6040	+0.0944	+37	−28

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

FEBRUARY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N. S.
		s	″	° ′	d h m	h m				°
45 Leonis	5.8	+2.54	−10.8	+10 11.6	28 15 10.9	+ 3 19.9	−0.8842	0.5318	−0.2652	− 3 −8
ρ Leonis	3.8	2.53	11.1	9 44.5	17 38.7	+ 5 42.9	−1.0761	0.5314	0.2674	−15 −8
48 Leonis	5.2	2.49	11.3	7 23.3	18 36.7	+ 6 39.1	+1.0742	0.5314	0.2682	+90 +1
49 Leonis	5.7	+2.52	−11.3	+ 9 5.2	18 42.8	+ 6 45.0	−0.6913	0.5313	−0.2683	+ 8 −8

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle H	Y	x'	y'	N. S.
		s	″	° ′	d h m	h m				°
37 Sextantis	6.3	+2.49	−11.9	+ 6 49.1	1 0 0.2	+11 52.2	+0.1984	0.5308	−0.2724	+55 −3
56 Leonis	6.1	2.48	12.5	6 38.2	4 45.1	− 7 32.1	−0.9161	0.5305	0.2754	− 5 −8
d Leonis	5.0	2.44	12.7	4 4.2	6 55.9	− 5 25.5	+1.0960	0.5304	0.2767	+90 −1
75 Leonis	5.4	+2.41	−13.5	+ 2 28.5	14 56.1	+ 2 19.3	+0.4869	0.5305	−0.2802	+73 −1
76 Leonis	6.0	2.41	13.6	2 6.8	15 43.1	+ 3 4.8	+0.6344	0.5306	0.2805	+84 −1
79 Leonis	5.5	2.40	13.8	+ 1 52.2	18 9.9	+ 5 26.9	+0.1926	0.5307	0.2812	+54 −3
υ Leonis	4.5	2.37	14.2	− 0 21.5	2 0 19.5	+11 24.6	+0.7139	0.5314	0.2823	+90 −
9 B. Virginis	6.2	2.36	14.6	+ 0 9.0	6 4.4	− 7 1.7	−1.4228	0.5323	0.2825	−52 −7
78 B. Virginis	6.5	+2.27	−14.9	− 5 15.0	17 58.5	+ 4 29.2	+0.6753	0.5351	−0.2801	+84 −
χ Virginis	4.8	2.21	15.2	7 31.9	3 5 35.8	− 8 16.6	−0.2537	0.5392	0.2742	+29 −5
ψ Virginis	5.0	2.18	15.2	9 4.9	12 31.2	− 1 35.1	−0.5770	0.5421	0.2689	+12 −6
49 Virginis	5.2	2.14	15.2	10 17.4	18 39.4	+ 4 20.6	−0.9957	0.5451	0.2631	−12 −0
i Virginis	5.7	2.09	15.0	12 16.2	4 3 4.1	−11 32.2	−1.1828	0.5495	0.2535	−28 −
75 Virginis	5.6	+2.07	−14.4	−14 55.8	5 45.9	− 8 56.1	+0.8080	0.5511	−0.2500	+75 −
83 Virginis	5.6	2.04	14.3	15 45.4	10 51.2	− 4 1.4	+0.3829	0.5541	0.2427	+50 −2
85 Virginis	6.1	2.04	14.4	15 20.7	11 20.0	− 3 33.6	−0.1457	0.5543	0.2420	+30 −3
43 H. Virginis	5.5	1.95	13.8	17 48.5	5 0 6.0	+ 8 44.7	−0.6310	0.5623	0.2205	+ 3 −8
231 G. Virginis	6.4	1.95	13.6	18 11.7	0 47.7	+ 9 24.8	−0.3965	0.5627	0.2192	+15 −0
236 G. Virginis	5.7	+1.94	−13.6	−18 19.6	1 27.6	+10 3.2	−0.4096	0.5632	−0.2179	+14 −0
9 G. Libræ	6.5	1.90	13.0	20 4.2	8 12.7	− 7 26.7	−0.0851	0.5675	0.2045	+29 −4
17 G. Libræ	6.4	1.86	12.8	20 49.2	12 52.8	− 2 57.1	−0.2634	0.5705	0.1944	+19 −5
18 G. Libræ	6.1	1.86	12.7	20 58.3	13 18.2	− 2 32.6	−0.1923	0.5708	0.1935	+22 −5
43 B. Libræ	5.7	1.84	12.8	21 2.2	17 26.0	+ 1 25.8	−0.9076	0.5734	0.1841	−17 −4
47 G. Libræ	6.1	+1.80	−12.2	−21 42.3	21 5.9	+ 4 57.2	−0.8944	0.5757	−0.1753	−17 −0
64 G. Libræ	5.8	1.77	12.0	22 5.3	6 1 4.6	+ 8 46.7	−1.1871	0.5780	0.1654	−40 −0
153 B. Libræ	6.3	1.72	11.1	24 12.3	7 41.9	− 8 51.5	−0.0955	0.5818	0.1482	+22 −4
42 Libræ	5.0	1.69	11.2	23 32.7	10 30.5	− 6 9.7	−1.1658	0.5833	0.1406	−41 −0
b Scorpii	4.7	1.66	10.3	25 29.8	14 39.5	− 2 10.6	+0.2424	0.5853	0.1290	+39 −3
A Scorpii	4.6	+1.65	−10.4	−25 4.6	15 41.3	− 1 11.2	−0.3126	0.5858	−0.1261	+ 9 −
31 B. Scorpii	5.4	1.64	10.7	24 17.0	15 48.5	− 1 4.3	−1.1287	0.5859	0.1258	−39 −0
3 Scorpii	5.9	1.65	10.4	24 59.7	16 5.7	− 0 47.9	−0.4460	0.5860	0.1250	+ 2 −7
4 Scorpii	5.7	1.65	10.0	26 1.1	16 24.6	− 0 29.7	+0.5482	0.5862	0.1240	+55 −
40 B. Scorpii	5.4	1.63	10.5	24 35.4	17 37.2	+ 0 40.0	−1.0432	0.5867	0.1206	−33 −0
π Scorpii	3.0	+1.64	−10.1	−25 52.4	17 42.5	+ 0 45.1	+0.2423	0.5867	−0.1203	+38 −3
48 B. Scorpii	4.9	1.62	10.1	25 37.9	19 27.1	+ 2 25.5	−0.2066	0.5875	0.1153	+14 −5
65 B. Scorpii	5.5	1.60	9.8	26 6.1	21 17.0	+ 4 10.9	+0.0623	0.5882	0.1099	+27 −4
85 B. Scorpii	6.0	1.57	10.0	25 15.9	23 54.0	+ 6 41.5	−1.0621	0.5892	0.1021	−36 −0
σ Scorpii	3.1	1.55	9.8	25 23.6	7 2 18.7	+ 9 0.4	−1.1711	0.5900	0.0949	−40 −0
α Scorpii	1.2	+1.52	− 9.3	−26 14.8	5 26.5	−11 59.5	−0.5889	0.5910	−0.0853	− 9 −
116 B. Scorpii	6.2	1.51	9.3	26 21.4	6 11.6	−11 16.3	−0.5418	0.5912	0.0830	− 7 −8
τ Scorpii	2.9	1.51	8.6	28 2.6	7 53.0	− 9 39.0	+1.0315	0.5917	0.0778	+62 −2
134 B. Scorpii	6.4	1.47	8.6	27 18.0	11 5.5	− 6 34.4	+0.0448	0.5924	0.0678	+22 −41
135 B. Scorpii	6.0	1.47	8.2	28 21.3	11 20.8	− 6 19.7	+1.0971	0.5924	0.0670	+62 −2
95 G. Ophiuchi	6.1	+1.36	− 7.9	−27 39.6	21 44.7	+ 3 38.5	−0.1329	0.5936	−0.0341	+11 −5
43 Ophiuchi	5.4	1.31	7.5	28 3.8	8 1 52.8	+ 7 36.4	+0.1642	0.5935	−0.0209	+25 −3
163 G. Ophiuchi	6.3	1.23	7.1	27 50.8	9 26.5	− 9 8.6	−0.1234	0.5927	+0.0034	+ 8 −51
X Sagittarii (*var.*)	4.4	1.21	7.0	27 48.1	11 3.9	− 7 35.2	−0.1594	0.5924	0.0085	+ 7 −5
4 G. Sagittarii	6.2	1.20	7.3	26 56.9	11 25.3	− 7 14.7	−1.0275	0.5923	0.0097	−42 −0
10 G. Sagittarii	5.7	+1.17	− 6.7	−28 3.2	14 32.3	− 4 15.3	+0.1475	0.5916	+0.0196	+25 −35

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
corpii	5.8	+1.17	− 6.4	−28 45.1	8 15 16.5	− 3 33.0	+0.8762	0.5914	+0.0219	+61	+ 8
agittarii	4.7	1.13	6.2	28 28.1	18 53.1	− 0 5.2	+0.6871	0.5903	0.0332	+59	− 4
D.−28° 14268	6.4	1.11	6.0	28 55.3	20 22.1	+ 1 20.1	+1.2039	0.5898	0.0379	+61	+39
agittarii	6.3	1.09	6.1	28 19.1	22 27.7	+ 3 20.7	+0.6724	0.5890	0.0443	+58	− 5
agittarii	6.0	1.09	5.9	28 41.0	22 27.9	+ 3 20.9	+1.0459	0.5890	0.0443	+61	+21
Sagittarii	4.7	+1.07	− 6.5	−27 4.6	22 44.4	+ 3 36.6	−0.5877	0.5889	+0.0452	−12	−86
Sagittarii	6.1	1.07	5.9	28 28.3	9 0 14.4	+ 5 3.1	+0.9130	0.5883	0.0498	+62	+11
Sagittarii	6.2	1.03	6.4	26 41.3	2 29.1	+ 7 12.3	−0.7954	0.5874	0.0567	−23	−90
Sagittarii	6.3	1.03	6.3	26 48.6	2 37.7	+ 7 20.5	−0.6613	0.5873	0.0571	−16	−90
Sagittarii	6.5	1.02	6.4	26 38.3	2 57.5	+ 7 39.5	−0.8188	0.5871	0.0581	−24	−90
Sagittarii	3.3	+0.96	− 5.8	−27 4.8	9 27.8	−10 5.8	+0.0756	0.5839	+0.0775	+25	−39
Sagittarii	2.1	0.91	5.7	26 24.3	13 15.6	− 6 27.0	−0.3042	0.5817	0.0885	+ 6	−63
Sagittarii	5.9	0.84	5.4	26 3.1	20 25.5	+ 0 26.1	+0.0380	0.5772	0.1085	+26	−42
Sagittarii	4.9	0.82	5.5	25 24.3	21 21.8	+ 1 20.2	−0.5254	0.5766	0.1110	− 3	−80
Sagittarii	4.9	0.78	5.5	24 40.6	10 1 18.8	+ 5 8.1	−0.8198	0.5738	0.1216	−18	−90
Sagittarii	5.8	+0.74	− 5.1	−24 54.4	5 42.7	+ 9 21.9	−0.0218	0.5706	+0.1328	+25	−45
Sagittarii	4.7	0.74	5.1	25 4.4	5 59.2	+ 9 37.9	+0.1867	0.5704	0.1335	+36	−33
Sagittarii	6.3	0.71	5.4	23 37.4	7 17.8	+10 53.5	−1.1366	0.5694	0.1368	−38	−90
Sagittarii	6.1	0.71	5.4	23 37.6	7 25.1	+11 0.5	−1.1175	0.5693	0.1371	−36	−90
Sagittarii	6.3	0.66	4.9	24 9.3	13 19.6	− 7 18.2	+0.2820	0.5648	0.1513	+43	−28
Sagittarii	6.1	+0.62	− 5.0	−22 58.4	16 20.1	− 4 24.4	−0.4781	0.5624	+0.1583	+ 5	−75
Sagittarii	6.5	0.61	5.0	22 50.2	17 20.0	− 3 26.7	−0.4616	0.5616	0.1605	+ 6	−73
Capricorni	5.7	0.56	4.8	22 4.5	23 28.3	+ 2 28.4	−0.2273	0.5567	0.1738	+19	−57
Capricorni	6.2	0.52	4.3	22 40.5	11 4 28.9	+ 7 18.2	+1.2956	0.5526	0.1839	+67	+44
Capricorni	5.7	0.40	4.7	18 14.8	15 50.9	− 5 43.4	−1.1181	0.5435	0.2045	−29	−90
Capricorni	6.2	+0.40	− 4.3	−19 22.0	18 1.5	− 3 37.2	+0.5028	0.5418	+0.2081	+62	−17
Capricorni	6.5	0.38	4.6	17 51.8	18 37.4	− 3 2.5	−0.9461	0.5413	0.2090	−16	−90
Capricorni	4.2	0.37	4.5	17 34.4	20 57.8	− 0 46.9	−0.7590	0.5395	0.2127	− 4	−90
URANUS	6.0	. . .	. . .	17 18.1	23 7.0	+ 1 18.0	−0.5828	0.5358	0.2154	+ 6	−82
Capricorni	6.1	0.34	4.2	17 41.9	12 1 13.5	+ 3 20.3	+0.2929	0.5362	0.2190	+52	−28
Capricorni	5.4	+0.34	− 3.9	−18 20.6	2 33.1	+ 4 37.3	+1.2622	0.5352	+0.2209	+72	+35
Capricorni	6.3	0.34	4.0	17 49.2	2 42.0	+ 4 45.9	+0.7463	0.5351	0.2211	+72	− 3
Capricorni	4.3	0.32	4.1	17 11.9	4 35.1	+ 6 35.4	+0.5123	0.5336	0.2237	+65	−17
Capricorni	5.1	0.24	4.0	14 25.7	13 51.5	− 8 26.1	−0.2736	0.5270	0.2353	+25	−59
Capricorni	6.0	0.24	3.9	14 47.4	14 35.4	− 7 43.6	+0.2802	0.5265	0.2361	+54	−29
Capricorni	5.8	+0.25	− 3.8	−15 8.4	15 2.7	− 7 17.2	+0.7579	0.5262	+0.2366	+75	− 4
Capricorni	6.1	0.22	3.9	13 7.2	17 49.8	− 4 35.4	−0.7112	0.5244	0.2396	+ 2	−90
Capricorni	5.2	0.22	− 3.7	13 57.2	19 34.8	− 2 53.7	+0.5897	0.5232	0.2414	+73	−13
MERCURY	0.7	. . .	. . .	−12 53.8	20 35.9	− 1 54.4	−0.2820	0.4962	0.2427	+26	−60
				NEW	*MOON.*						
Piscium	3.7	0.00	+ 4.7	+14 54.6	17 15 6.0	−10 41.6	−1.0811	0.5042	+0.2291	−17	−75
Piscium	6.2	+0.02	4.8	14 13.7	17 22.1	− 8 29.4	+0.1837	0.5049	0.2266	+54	−30
Piscium	6.1	0.02	5.2	15 58.6	19 24.2	− 6 30.9	−1.2798	0.5055	0.2243	−35	−74
Arietis	5.8	0.04	5.6	16 32.1	23 50.9	− 2 12.0	−0.9095	0.5070	0.2191	− 6	−73
Arietis	5.1	+0.06	+ 6.1	+17 24.3	18 4 36.5	+ 2 25.3	−0.8409	0.5087	+0.2131	− 2	−73
Arietis	6.4	0.08	6.4	17 50.8	7 53.5	+ 5 36.5	−0.6365	0.5099	0.2088	+10	−71
Arietis	6.5	0.10	6.4	17 37.6	9 58.8	+ 7 38.0	+0.0394	0.5107	0.2059	+46	−34
Arietis	6.4	0.11	6.3	16 49.7	10 48.7	+ 8 26.5	+1.0920	0.5110	0.2048	+90	+24
Arietis	5.9	0.10	6.8	19 6.1	11 25.7	+ 9 2.4	−1.2919	0.5112	0.2039	−39	−71
Arietis	5.6	+0.13	+ 7.2	+19 30.6	15 15.5	−11 14.7	−0.9733	0.5128	+0.1985	−11	−70
Arietis	6.2	0.18	7.6	19 28.8	21 35.5	− 5 6.2	+0.2860	0.5154	0.1889	+60	−19
Arietis	5.4	0.20	8.4	21 35.8	19 1 40.5	− 1 8.6	−1.2965	0.5172	0.1825	−43	−68
Arietis	5.7	0.24	8.0	19 39.1	3 28.1	+ 0 35.7	+1.1798	0.5180	0.1795	+90	+36
Arietis (*mean*)	4.6	0.31	8.7	21 0.2	11 47.3	+ 8 39.4	+1.1200	0.5217	0.1653	+90	+32
Arietis	5.8	+0.43	+10.1	+24 25.6	23 55.5	− 3 35.3	−0.8012	0.5272	+0.1428	− 2	−66

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

THE STAR'S					AT CONJUNCTION IN R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.		Hour Angle, *H*	*Y*	x'	y'	N.	S
		Δα	Δδ									
		s	"	° ′	d	h m	h m				°	°
7 Tauri	5.9	+0.49	+10.1	+24 11.0	20	4 46.5	+ 1 6.5	+0.1385	0.5295	+0.1333	+52	−22
11 Tauri	6.1	0.52	10.5	25 3.5		7 46.0	+ 4 0.2	−0.4427	0.5308	0.1272	+19	−50
16 Tauri	5.4	0.55	10.2	24 1.5		9 41.3	+ 5 51.7	+0.9429	0.5316	0.1232	+90	+23
17 Tauri	3.8	0.55	10.1	23 51.0		9 43.5	+ 5 53.9	+1.1425	0.5317	0.1231	+90	+40
18 Tauri	5.6	0.55	10.4	24 34.6		9 50.9	+ 6 1.0	+0.3521	0.5317	0.1229	+66	− 8
q Tauri	4.3	+0.56	+10.2	+24 12.3		9 52.5	+ 6 2.5	+0.7678	0.5317	+0.1228	+90	+14
20 Tauri	4.1	0.56	10.2	24 6.3		10 10.2	+ 6 19.7	+0.9131	0.5318	0.1222	+90	+23
21 Tauri	5.8	0.56	10.3	24 17.6		10 12.3	+ 6 21.8	+0.7100	0.5319	0.1221	+90	+10
22 Tauri	6.5	0.56	10.3	24 16.0		10 16.3	+ 6 25.6	+0.7475	0.5319	0.1220	+90	+13
η Tauri	3.0	0.57	10.2	23 50.8		10 57.3	+ 7 5.3	+1.2966	0.5322	0.1206	+70	+59
14 H. Tauri	5.3	+0.58	+10.6	+25 19.6		12 15.8	+ 8 21.2	−0.1895	0.5328	+0.1178	+33	−35
p Tauri	5.6	0.72	11.0	26 15.8		21 49.0	− 6 24.5	−0.1996	0.5368	0.0971	+32	−34
φ Tauri	5.0	0.78	11.3	27 9.1	21	2 11.6	− 2 10.6	−0.7801	0.5385	0.0873	− 1	−63
χ Tauri	5.3	0.80	10.8	25 26.0		3 14.7	− 1 9.7	+1.2144	0.5389	0.0849	+85	+50
17 B. Aurigæ	6.0	1.01	11.3	27 45.6		16 56.4	−11 55.8	−0.4174	0.5436	0.0527	+20	−42
38 B. Aurigæ	6.5	+1.09	+11.0	+27 34.9		22 16.3	− 6 46.8	+0.0261	0.5451	+0.0397	+45	−16
47 B. Aurigæ	6.0	1.13	11.1	27 55.6	22	0 33.4	− 4 34.4	−0.2716	0.5457	0.0341	+28	−32
354 B. Tauri	6.4	1.20	10.9	27 52.5		5 34.8	+ 0 16.5	−0.0737	0.5468	0.0217	+39	−20
22 Aurigæ	6.4	1.23	11.2	28 51.6		6 37.6	+ 1 17.2	−1.1380	0.5470	0.0190	−31	−61
β Tauri	1.8	1.25	11.0	28 32.4		7 55.7	+ 2 32.6	−0.7622	0.5473	0.0158	− 1	−61
107 B. Aurigæ	6.5	+1.31	+10.4	+27 36.6		12 13.7	+ 6 41.6	+0.3063	0.5480	+0.0050	+63	+ 1
112 B. Aurigæ	5.7	1.31	10.1	26 52.5		12 46.9	+ 7 13.6	+1.1185	0.5481	+0.0036	+90	+49
406 B. Tauri	5.6	1.42	10.1	27 56.8		18 53.0	−10 53.0	−0.0859	0.5490	−0.0118	+39	−21
136 Tauri	4.6	1.43	9.9	27 35.8		19 56.0	− 9 52.2	+0.2853	0.5491	0.0145	+62	− 1
154 B. Aurigæ	6.4	1.47	10.3	28 56.0		21 20.3	− 8 30.9	−1.2054	0.5492	0.0181	−40	−61
415 B. Tauri	6.1	+1.49	+ 9.7	+27 34.3		23 19.8	− 6 35.6	+0.2478	0.5494	−0.0231	+59	− 4
49 Aurigæ	5.1	1.73	8.5	28 5.5	23	14 24.9	+ 7 57.8	−0.9566	0.5496	0.0613	−14	−62
37 Geminorum	5.7	1.83	6.6	25 29.1		23 21.4	− 7 24.5	+1.2338	0.5489	0.0835	+82	+53
39 Geminorum	6.2	1.86	6.7	26 11.7	24	0 53.5	− 5 55.6	+0.3301	0.5487	0.0873	+64	− 5
40 Geminorum	6.3	1.86	6.6	26 1.9		1 11.2	− 5 38.4	+0.4814	0.5487	0.0880	+76	+ 2
47 Geminorum	5.6	+1.96	+ 6.3	+26 59.9		6 27.8	− 0 32.8	−1.0645	0.5480	−0.1009	−22	−65
52 Geminorum	6.1	1.95	5.5	25 2.1		7 58.1	+ 0 54.3	+0.9072	0.5478	0.1045	+90	+25
134 B. Geminorum	6.5	1.99	6.0	26 50.7		8 59.2	+ 1 53.3	−1.1591	0.5477	0.1069	−31	−63
A Geminorum	5.1	2.00	5.1	25 13.0		11 52.9	+ 4 41.0	+0.2830	0.5471	0.1138	+61	−10
176 B. Geminorum	6.3	2.08	4.0	24 33.1		18 29.7	+11 4.0	+0.1939	0.5458	0.1293	+55	−17
181 B. Geminorum	6.0	+2.08	+ 3.9	+24 25.0		18 55.7	+11 29.1	+0.2836	0.5457	−0.1303	+61	−12
κ Geminorum	3.7	2.12	3.7	24 36.2		21 17.0	−10 14.5	−0.2304	0.5453	0.1356	+31	−30
82 Geminorum	6.3	2.12	3.0	23 21.2		23 9.2	− 8 26.1	+0.8554	0.5448	0.1399	+90	+18
5 B. Cancri	6.4	2.20	2.4	23 49.1	25	4 46.2	− 3 0.7	−0.4644	0.5435	0.1523	+18	−54
9 Cancri	6.2	2.21	1.8	22 52.8		7 10.8	− 0 41.0	+0.1663	0.5430	0.1575	+53	−21
μ Cancri	5.5	+2.19	+ 1.3	+21 49.8		7 51.4	− 0 1.8	+1.1810	0.5428	−0.1589	+90	+30
35 B. Cancri	6.4	2.26	1.5	23 23.7		10 32.0	+ 2 33.2	−0.9232	0.5421	0.1646	− 9	−67
49 B. Cancri	6.0	2.24	+ 0.2	21 1.0		13 35.9	+ 5 31.0	+1.0970	0.5413	0.1710	+90	+31
η Cancri	5.5	2.30	− 0.6	20 43.8		19 16.0	+10 59.7	+0.3968	0.5399	0.1824	+68	−12
39 Cancri	6.5	2.32	1.3	20 18.5		22 40.5	− 9 42.8	+0.2105	0.5390	0.1890	+56	−22
40 Cancri	6.5	+2.32	− 1.3	+20 16.3		22 42.9	− 9 40.4	+0.2415	0.5390	−0.1891	+58	−20
102 B. Cancri	6.5	2.32	1.4	19 58.3		22 48.0	− 9 35.5	+0.5443	0.5390	0.1893	+70	− 5
ε Cancri	6.3	2.32	1.4	19 50.7		22 50.4	− 9 33.1	+0.6690	0.5390	0.1894	+90	+ 1
139 B. Cancri	6.1	2.35	2.3	19 9.0	26	3 36.5	− 4 56.7	+0.4790	0.5378	0.1983	+74	−13
227 B. Cancri	6.4	2.41	5.3	15 43.7		17 52.4	+ 8 50.9	+1.0557	0.5346	0.2228	+90	+21
12 B. Leonis	6.3	+2.45	− 5.2	+16 57.1		19 52.6	+10 47.2	−0.6698	0.5342	−0.2260	+ 8	−73
7 Leonis	6.2	2.45	6.5	14 45.5	27	0 46.0	− 8 29.0	+0.4952	0.5322	0.2334	+74	−13
11 Leonis	6.5	2.45	6.6	14 43.8		1 46.7	− 7 30.2	+0.2868	0.5330	0.2348	+60	−24
ψ Leonis	5.6	2.47	7.1	14 24.5		4 28.7	− 4 53.5	−0.0187	0.5326	0.2387	+43	−30
ν Leonis	5.0	2.49	8.4	12 50.9		11 21.8	+ 1 46.2	−0.0762	0.5317	0.2478	+40	−44
A Leonis	4.6	+2.47	− 9.5	+10 24.7		15 59.4	+ 6 14.8	+1.2783	0.5312	−0.2534	+90	+26

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MARCH.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
Leonis	1.3	+2.51	− 9.1	+12 22.8	27 16 12.3	+ 6 27.3	−0.8060	0.5312	−0.2536	+ 1	−78
Leonis	5.9	2.50	10.8	9 12.9	28 0 15.8	− 9 44.9	+0.3712	0.5307	0.2623	+65	−23
Leonis	5.8	2.53	10.7	10 11.6	1 24.0	− 8 38.9	−0.9312	0.5306	0.2634	− 6	−80
Leonis	3.8	2.53	11.1	9 44.5	3 52.0	− 6 15.7	−1.1194	0.5306	0.2657	−19	−80
Leonis	5.2	2.50	11.7	7 23.3	4 50.1	− 5 19.4	+1.0306	0.5306	0.2666	+90	+13
Leonis	5.7	+2.52	−11.4	+ 9 5.2	4 56.1	− 5 13.6	−0.7335	0.5307	−0.2667	+ 6	−80
Sextantis	6.3	2.52	12.4	6 49.1	10 13.4	− 0 6.5	+0.1623	0.5307	0.2710	+52	−34
Leonis	6.1	2.54	13.0	6 38.1	14 57.6	+ 4 28.5	−0.9433	0.5311	0.2744	− 6	−83
Leonis	5.0	2.51	13.6	4 4.2	17 7.9	+ 6 34.6	+1.0664	0.5313	0.2757	+90	+14
Leonis	5.4	2.52	14.6	2 28.4	29 1 5.1	− 9 43.6	+0.4697	0.5325	0.2798	+72	−19
Leonis	6.0	+2.52	−14.7	+ 2 6.8	1 51.7	− 8 58.5	+0.6176	0.5326	−0.2801	+83	−12
Leonis	5.5	2.53	15.0	+ 1 52.2	4 17.2	− 6 37.7	+0.1812	0.5331	0.2810	+54	−34
Leonis	4.5	2.52	15.7	− 0 21.5	10 23.0	− 0 43.8	+0.7081	0.5345	0.2825	+88	− 7
Virginis	6.2	2.54	16.1	+ 0 9.0	16 3.4	+ 4 45.4	−1.4060	0.5362	0.2831	−48	−76
Virginis	6.5	2.53	17.2	− 5 15.1	30 3 45.7	− 7 55.6	+0.6939	0.5406	0.2815	+85	− 8
Virginis	4.8	+2.54	−17.9	− 7 32.0	15 8.4	+ 3 4.0	−0.2092	0.5460	−0.2761	+31	−55
Virginis	5.0	2.54	18.1	9 5.0	21 53.8	+ 9 35.4	−0.5185	0.5497	0.2712	+15	−75
Virginis	5.2	2.54	18.2	10 17.5	31 3 52.3	− 8 38.6	−0.9229	0.5533	0.2656	− 8	−90
Virginis	5.7	2.54	18.2	12 16.2	12 2.9	− 0 45.4	−1.0952	0.5586	0.2562	−21	−90
Virginis	5.6	2.54	18.0	14 55.9	14 39.9	+ 1 45.9	+0.8722	0.5603	0.2527	+75	+ 3
Virginis	5.6	+2.54	−17.8	−15 45.4	19 36.0	+ 6 31.2	+0.4592	0.5637	−0.2456	+63	−20
Virginis	6.1	+2.54	−17.9	−15 20.7	20 3.9	+ 6 58.2	−0.0613	0.5640	−0.2448	+35	−47

APRIL.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
H. Virginis	5.5	+2.53	−17.3	−17 48.6	1 8 25.6	− 5 7.9	−0.5240	0.5727	−0.2233	+ 8	−77
G. Virginis	6.4	2.53	17.2	18 11.7	9 6.0	− 4 29.0	−0.2922	0.5732	0.2220	+20	−61
G. Virginis	5.7	2.53	17.2	18 19.6	9 44.6	− 3 51.9	−0.3043	0.5737	0.2207	+19	−61
G. Libræ	6.5	2.53	16.6	20 4.3	16 16.4	+ 2 24.9	+0.0226	0.5783	0.2071	+34	−42
G. Libræ	6.4	2.53	16.2	20 49.2	20 47.2	+ 6 45.1	−0.1483	0.5813	0.1969	+25	−52
G. Libræ	6.1	+2.53	−16.2	−20 58.4	21 11.9	+ 7 8.9	−0.0779	0.5816	−0.1960	+28	−48
B. Libræ	5.7	2.54	16.4	21 2.3	2 1 11.5	+10 59.0	−0.7781	0.5843	0.1864	−10	−90
G. Libræ	6.1	2.51	15.5	21 42.4	4 44.0	− 9 37.0	−0.7617	0.5866	0.1776	−10	−90
G. Libræ	5.8	2.50	15.2	22 5.4	8 35.0	− 5 55.3	−1.0464	0.5889	0.1675	−29	−90
B. Libræ	6.3	2.49	14.2	24 12.3	14 59.3	+ 0 13.4	+0.0337	0.5925	0.1500	+29	−42
Libræ	5.0	+2.47	−14.1	−23 32.8	17 42.5	+ 2 49.9	−1.0181	0.5939	−0.1422	−29	−90
Scorpii	4.7	2.47	13.2	25 29.8	21 43.8	+ 6 41.3	+0.3718	0.5957	0.1305	+45	−23
Scorpii	4.6	2.46	13.2	25 4.7	22 43.6	+ 7 38.6	−0.1742	0.5962	0.1275	+16	−54
B. Scorpii	5.4	2.45	13.4	24 17.1	22 50.6	+ 7 45.3	−0.9780	0.5962	0.1271	−28	−90
Scorpii	5.9	2.46	13.2	24 59.8	23 7.3	+ 8 1.3	−0.3054	0.5963	0.1263	+10	−62
Scorpii	5.7	+2.47	−12.9	−26 1.2	23 25.6	+ 8 18.8	+0.6743	0.5964	−0.1254	+62	− 6
B. Scorpii	5.4	2.45	13.1	24 35.4	3 0 36.0	+ 9 26.4	−0.8927	0.5970	0.1218	−23	−90
Scorpii	3.0	2.46	12.8	25 52.4	0 41.1	+ 9 31.3	+0.3738	0.5970	0.1216	+45	−23
B. Scorpii	4.9	2.45	12.7	25 38.0	2 22.5	+11 8.5	−0.0672	0.5977	0.1165	+21	−47
B. Scorpii	6.4	2.43	13.0	24 29.8	2 36.0	+11 21.4	−1.2248	0.5977	0.1158	−50	−84
B. Scorpii	5.5	+2.44	−12.3	−26 6.2	4 9.1	−11 9.4	+0.1989	0.5982	−0.1110	+34	−32
B. Scorpii	6.0	2.42	12.3	25 15.9	6 41.4	− 8 43.5	−0.9077	0.5991	0.1031	−25	−90
Scorpii	3.1	2.40	12.0	25 23.6	9 2.0	− 6 28.8	−1.0138	0.5997	0.0957	−33	−90
Scorpii	1.2	2.39	11.4	26 14.8	12 4.4	− 3 34.0	−0.4381	0.6004	0.0860	− 1	−72
B. Scorpii	6.2	2.39	11.3	26 21.4	12 48.3	− 2 52.0	−0.3913	0.6006	0.0837	+ 1	−69
Scorpii	2.9	+2.40	−10.6	−28 2.6	14 26.8	− 1 17.6	+1.1613	0.6009	−0.0784	+62	+33
B. Scorpii	6.4	2.36	10.5	27 18.0	17 34.1	+ 1 41.7	+0.1900	0.6013	0.0683	+30	−33
B. Scorpii	6.0	2.38	10.1	28 21.3	17 49.0	+ 1 56.0	+1.2284	0.6013	0.0674	+62	+42
B. Ophiuchi	6.2	2.28	9.7	26 24.1	4 1 55.7	+ 9 42.0	−1.1681	0.6016	0.0408	−50	−90
G. Ophiuchi	6.1	2.28	9.0	27 39.6	3 57.3	+11 38.5	+0.0196	0.6014	0.0341	+18	−43
Oph. (*1st star*)	5.4	+2.24	− 9.6	−26 28.9	5 4.4	−11 17.3	−1.2009	0.6013	−0.0304	−54	−85

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x'*	*y'*	N.	S.
		s	"	° '	d h m	h m				°	°
43 Ophiuchi	5.4	+2.25	-8.4	-28 3.8	4 7 59.7	- 8 29.3	+0.3149	0.6009	-0.0207	+33	-26
163 G. Ophiuchi	6.3	2.17	7.5	27 50.8	15 23.9	- 1 23.9	+0.0333	0.5991	+0.0037	+16	-42
X Sagittarii (*var.*)	4.4	2.15	7.3	27 48.1	16 59.3	+ 0 7.6	-0.0019	0.5985	0.0089	+15	-44
4 G. Sagittarii	6.2	2.13	7.6	26 56.9	17 20.3	+ 0 27.6	-0.8609	0.5984	0.0100	-31	-90
10 G. Sagittarii	5.7	2.12	6.8	28 3.2	20 23.9	+ 3 23.6	+0.3030	0.5973	0.0200	+32	-26
210 B. Scorpii	5.8	+2.12	-6.4	-28 45.1	21 7.3	+ 4 5.2	+1.0249	0.5970	+0.0223	+61	-20
38 B. Sagittarii	4.7	2.08	6.0	28 28.1	5 0 40.3	+ 7 29.4	+0.8390	0.5954	0.0337	+62	+ 6
48 G. Sagittarii	6.3	2.04	5.7	28 19.1	4 11.5	+10 51.9	+0.8256	0.5936	0.0448	+62	+ 5
62 B. Sagittarii	6.0	2.04	5.5	28 41.0	4 11.7	+10 52.0	+1.1960	0.5936	0.0448	+61	-38
66 B. Sagittarii	4.7	2.01	6.0	27 4.5	4 27.9	+11 7.5	-0.4236	0.5935	0.0456	- 4	-71
58 G. Sagittarii	6.1	+2.02	-5.4	-28 28.3	5 56.7	-11 27.3	+1.0648	0.5927	+0.0503	+62	+23
68 G. Sagittarii	6.2	1.96	5.7	26 41.3	8 9.5	- 9 20.0	-0.6293	0.5914	0.0571	-14	-90
69 G. Sagittarii	6.3	1.96	5.6	26 48.6	8 18.0	- 9 11.7	-0.4962	0.5913	0.0575	- 6	-77
86 B. Sagittarii	6.5	1.95	5.6	26 38.3	8 37.5	- 8 53.1	-0.6524	0.5910	0.0585	-15	-90
φ Sagittarii	3.3	1.89	4.6	27 4.8	15 3.1	- 2 43.1	+0.2359	0.5870	0.0778	+33	-30
σ Sagittarii	2.1	+1.83	-4.4	-26 24.3	18 48.6	+ 0 53.4	-0.1411	0.5843	+0.0888	+15	-52
201 B. Sagittarii	5.9	1.74	3.6	26 3.1	6 1 55.1	+ 7 43.0	+0.1991	0.5789	0.1086	+34	-32
ψ Sagittarii	4.9	1.72	3.8	25 24.3	2 51.1	+ 8 36.8	-0.3614	0.5781	0.1111	+ 6	-66
χ Sagittarii	4.9	1.66	3.6	24 40.5	6 46.8	-11 36.6	-0.6550	0.5748	0.1215	- 9	-90
49 Sagittarii	5.5	1.64	3.7	24 7.8	6 52.8	-11 30.9	-1.2032	0.5747	0.1217	-46	-88
51 Sagittarii	5.8	+1.61	-3.0	-24 54.4	11 9.6	- 7 23.9	+0.1391	0.5711	+0.1326	+34	-30
h Sagittarii	4.7	1.61	2.9	25 4.4	11 26.0	- 7 8.1	+0.3469	0.5708	0.1333	+45	-24
53 Sagittarii	6.3	1.57	3.2	23 37.4	12 44.5	- 5 52.5	-0.9722	0.5697	0.1365	-26	-90
274 B. Sagittarii	6.1	1.57	3.2	23 37.5	12 51.7	- 5 45.6	-0.9531	0.5696	0.1368	-25	-90
308 B. Sagittarii	6.3	1.50	2.5	24 9.2	18 45.7	- 0 4.8	+0.4410	0.5644	0.1508	+52	-19
329 B. Sagittarii	6.1	+1.45	-2.4	-22 58.3	21 46.2	+ 2 49.0	-0.3183	0.5617	+0.1575	+13	-63
336 B. Sagittarii	6.5	1.44	2.4	22 50.1	22 46.2	+ 3 46.8	-0.3022	0.5608	0.1597	+14	-62
4 Capricorni	5.7	1.36	2.0	22 4.4	7 4 55.1	+ 9 42.4	-0.0706	0.5552	0.1727	+27	-48
19 Capricorni	5.7	1.13	1.6	18 14.8	21 22.8	+ 1 35.9	-0.9711	0.5407	0.2026	-17	-90
20 Capricorni	6.2	1.12	1.0	19 21.9	23 34.5	+ 3 43.2	+0.6506	0.5388	0.2061	+69	- 9
21 Capricorni	6.5	+1.09	-1.4	-17 51.8	8 0 10.6	+ 4 18.0	-0.8010	0.5383	+0.2070	- 7	-90
θ Capricorni	4.2	1.07	1.3	17 34.3	2 32.1	+ 6 34.8	-0.6154	0.5363	0.2105	+ 4	-85
114 B. Capricorni	6.1	1.02	0.9	17 41.8	6 50.2	+10 44.4	+0.4355	0.5328	0.2167	+60	-20
URANUS	6.0	. . .	. . .	16 58.8	6 51.7	+10 45.9	-0.3138	0.5314	0.2164	+20	-62
31 Capricorni	6.3	1.01	0.7	17 49.2	8 19.6	-11 49.0	+0.8888	0.5316	0.2187	+72	+ 5
ι Capricorni	4.3	+0.98	-0.7	-17 11.8	10 13.8	- 9 58.5	+0.6527	0.5302	+0.2212	+72	- 9
42 Capricorni	5.1	0.86	0.8	14 25.6	19 36.2	- 0 54.0	-0.1440	0.5232	0.2324	+31	-51
44 Capricorni	6.0	0.86	0.6	14 47.3	20 20.6	- 0 11.1	+0.4110	0.5226	0.2332	+61	-22
45 Capricorni	5.8	0.86	0.4	15 8.4	20 48.3	+ 0 15.8	+0.8901	0.5223	0.2337	+75	+ 5
151 B. Capricorni	6.1	0.82	0.8	13 7.2	23 37.3	+ 2 59.6	-0.5875	0.5204	0.2366	+ 9	-82
μ Capricorni	5.2	+0.82	-0.4	-13 57.2	9 1 23.6	+ 4 42.5	+0.7166	0.5192	+0.2383	+76	- 6
e Aquarii	5.4	0.72	0.2	11 59.0	10 9.0	-10 48.0	+0.7474	0.5138	0.2458	+78	- 4
150 B. Aquarii	6.0	0.66	0.7	9 27.8	13 22.0	- 7 40.8	-1.1422	0.5119	0.2483	-23	-90
167 G. Aquarii	6.3	0.57	0.1	8 20.4	10 0 30.7	+ 3 8.3	+0.4613	0.5064	0.2550	+68	-20
67 Aquarii	6.4	0.55	0.1	7 24.5	3 4.8	+ 5 37.9	+0.1205	0.5053	0.2563	+49	-37
252 B. Aquarii	5.8	+0.49	-0.1	- 5 26.4	9 24.7	+11 46.8	-0.3605	0.5028	+0.2587	+24	-64
197 G. Aquarii	6.3	0.48	0.0	5 15.9	10 32.2	-11 7.6	-0.2590	0.5024	0.2591	+30	-58
263 B. Aquarii	6.1	0.46	+0.2	5 10.1	12 48.0	- 8 55.6	+0.2249	0.5017	0.2598	+55	-32
293 B. Aquarii	5.5	0.41	0.4	3 57.6	20 20.9	- 1 35.6	+0.8916	0.4995	0.2614	+86	- 3
13 Piscium	6.4	0.34	0.7	1 33.3	11 5 14.0	+ 7 2.6	+0.6211	0.4976	0.2619	+83	-12
14 Piscium	5.9	+0.34	+0.8	- 1 43.0	6 25.2	+ 8 11.8	+1.1073	0.4974	+0.2619	+88	+17
λ Piscium	4.6	0.29	0.6	+ 1 18.7	10 44.4	-11 36.2	-1.0436	0.4968	0.2616	-13	-60
21 Piscium	5.6	0.28	1.0	0 36.3	14 46.7	- 7 40.7	+0.7802	0.4965	0.2611	+90	- 3
22 Piscium	5.8	0.26	0.8	2 27.5	16 8.9	- 6 20.7	-0.8752	0.4963	0.2609	- 2	-88
25 Piscium	6.2	+0.26	+1.0	+ 1 37.1	16 45.5	- 5 45.1	+0.1958	0.4962	+0.2608	+54	-33
				NEW	*MOON.*						

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
Arietis (*mean*)	4.6	+0.16	+7.2	+21 0.2	15 18 43.0	− 6 37.2	+0.9826	0.5236	+0.1644	+90	+23
Arietis	5.8	0.22	8.3	24 25.6	16 6 50.7	+ 5 7.5	−0.9587	0.5292	0.1419	−11	−66
Tauri	5.9	0.26	8.4	24 10.9	11 41.6	+ 9 49.1	−0.0233	0.5313	0.1323	+42	−28
Tauri	6.1	0.28	8.7	25 3.5	14 41.0	−11 17.3	−0.6095	0.5326	0.1262	+10	−60
Tauri	5.4	0.30	8.6	24 1.5	16 36.3	− 9 25.8	+0.7769	0.5334	0.1223	+90	+14
Tauri	3.8	+0.31	+8.5	+23 51.0	16 38.5	− 9 23.6	+0.9770	0.5334	+0.1222	+90	+27
Tauri	5.6	0.30	8.7	24 34.6	16 45.9	− 9 16.4	+0.1846	0.5335	0.1219	+55	−17
Tauri	4.3	0.31	8.6	24 12.2	16 47.6	− 9 14.7	+0.6012	0.5335	0.1219	+86	+ 5
Tauri	4.1	0.31	8.6	24 6.3	17 5.2	− 8 57.8	+0.7465	0.5336	0.1213	+90	+13
Tauri	5.8	0.31	8.6	24 17.5	17 7.3	− 8 55.7	+0.5430	0.5336	0.1212	+81	+ 2
Tauri	6.5	+0.31	+8.6	+24 16.0	17 11.3	− 8 51.9	+0.5804	0.5337	+0.1210	+84	+ 4
Tauri	4.3	0.31	8.5	23 41.2	17 19.7	− 8 43.8	+1.2411	0.5337	0.1208	+84	+50
Tauri	3.0	0.32	8.6	23 50.7	17 52.3	− 8 12.2	+1.1299	0.5340	0.1196	+90	+39
Tauri	3.7	0.32	8.6	23 47.8	18 39.8	− 7 26.2	+1.2781	0.5343	0.1180	+76	+56
Tauri	5.2	0.32	8.6	23 52.8	18 40.4	− 7 25.6	+1.1865	0.5343	0.1180	+90	+44
. Tauri	5.3	+0.32	+8.8	+25 19.6	19 10.8	− 6 56.2	−0.3610	0.5345	+0.1169	+23	−45
Tauri	5.6	0.41	9.3	26 15.8	17 4 44.6	+ 2 18.7	−0.3820	0.5382	0.0962	+22	−44
Tauri	5.0	0.46	9.6	27 9.1	9 7.6	+ 6 33.0	−0.9689	0.5397	0.0863	−15	−63
Tauri	5.3	0.47	9.2	25 25.9	10 10.8	+ 7 34.1	+1.0303	0.5401	0.0839	+90	+35
. Aurigæ	6.0	0.63	9.9	27 45.5	23 55.3	− 3 9.3	−0.6198	0.5440	0.0517	+ 8	−56
. Aurigæ	6.5	+0.70	+9.8	+27 34.9	18 5 16.8	+ 2 1.3	−0.1794	0.5452	+0.0388	+33	−27
. Aurigæ	6.0	0.72	9.8	27 55.6	7 34.7	+ 4 14.4	−0.4803	0.5456	0.0332	+16	−45
. Tauri	6.4	0.79	9.8	27 52.5	12 38.2	+ 9 7.5	−0.2856	0.5464	0.0208	+27	−32
Tauri	1.8	0.83	9.8	28 32.4	15 0.1	+11 24.6	−0.9793	0.5467	0.0150	−16	−61
. Aurigæ	6.5	0.88	9.4	27 36.6	19 20.2	− 8 24.3	+0.0913	0.5471	0.0042	+49	− 9
. Aurigæ	5.7	+0.89	+9.2	+26 52.5	19 53.7	− 7 52.0	+0.9073	0.5471	+0.0028	+90	+34
. Tauri	5.6	0.98	9.4	27 56.8	19 2 3.3	− 1 55.1	−0.3077	0.5475	−0.0125	+26	−32
Tauri	4.6	0.99	9.2	27 35.7	3 7.0	− 0 53.6	+0.0649	0.5475	0.0151	+47	−12
. Tauri	6.1	1.04	9.0	27 34.3	6 33.0	+ 2 25.3	+0.0252	0.5475	0.0237	+45	−15
Aurigæ	5.1	1.26	8.3	28 5.5	21 50.2	− 6 49.2	−1.1963	0.5464	0.0614	−38	−62
Geminorum	5.7	+1.36	+6.8	+25 29.1	20 6 55.6	+ 1 57.4	+1.0077	0.5449	−0.0832	+90	+33
Geminorum	6.2	1.39	6.9	26 11.7	8 29.4	+ 3 28.0	+0.0959	0.5446	0.0869	+49	−17
Geminorum	6.3	1.39	6.8	26 1.9	8 47.4	+ 3 45.4	+0.2484	0.5445	0.0876	+59	−10
Geminorum	6.1	1.48	5.8	25 2.1	15 41.9	+10 25.8	+0.6762	0.5430	0.1037	+90	+11
Geminorum	5.1	1.53	5.6	25 13.0	19 41.4	− 9 42.9	+0.0456	0.5420	0.1129	+46	−22
. Geminorum	6.3	+1.62	+4.6	+24 33.2	21 2 26.7	− 3 11.3	−0.0453	0.5403	−0.1279	+41	−29
. Geminorum	6.0	1.62	4.6	24 25.0	2 53.2	− 2 45.7	+0.0453	0.5402	0.1289	+46	−24
. Geminorum	6.3	1.61	4.1	23 13.0	3 43.3	− 1 57.3	+1.2402	0.5399	0.1307	+84	+49
Geminorum	3.7	1.65	4.4	24 36.2	5 17.7	− 0 26.0	−0.4742	0.5395	0.1341	+17	−53
Geminorum	6.3	1.66	3.8	23 21.2	7 12.4	+ 1 24.8	+0.6225	0.5389	0.1382	+88	+ 4
3. Cancri	6.4	+1.74	+3.3	+23 49.1	12 57.3	+ 6 58.1	−0.7107	0.5373	−0.1503	+ 4	−66
Cancri	6.2	1.76	2.7	22 52.8	15 25.5	+ 9 21.4	−0.0732	0.5366	0.1554	+39	−33
Cancri	5.5	1.75	2.2	21 49.8	16 7.1	+10 1.6	+0.9523	0.5363	0.1568	+90	+22
3. Cancri	6.4	1.81	2.5	23 23.7	18 51.6	−11 19.3	−1.1740	0.5355	0.1623	−30	−67
3. Cancri	6.0	1.82	1.3	21 1.0	22 0.1	− 8 17.0	+0.8687	0.5346	0.1685	+90	+15
Cancri	5.5	+1.88	+0.5	+20 43.8	22 3 48.9	− 2 39.6	+0.1623	0.5329	−0.1796	+53	−24
Cancri	6.5	1.92	0.0	20 18.5	7 18.8	+ 0 43.4	−0.0247	0.5319	0.1860	+42	−34
Cancri	6.5	1.92	0.0	20 16.3	7 21.3	+ 0 45.9	+0.0066	0.5319	0.1861	+44	−32
B. Cancri	6.5	1.91	−0.2	19 58.3	7 26.5	+ 0 50.9	+0.3128	0.5319	0.1862	+62	−17
Cancri	6.3	1.91	0.2	19 50.8	7 29.0	+ 0 53.3	+0.4390	0.5319	0.1863	+71	−11
B. Cancri	6.1	+1.96	−1.1	+19 9.0	12 22.6	+ 5 37.4	+0.2490	0.5305	−0.1950	+58	−21
B. Cancri	6.4	2.06	4.0	15 43.9	23 3 1.6	− 4 11.9	+0.8415	0.5270	0.2188	+90	+ 7
B. Leonis	6.3	2.10	3.8	16 57.1	5 5.0	− 2 12.5	−0.9018	0.5266	0.2219	− 6	−73
Leonis	6.2	2.12	5.2	14 45.5	10 6.3	+ 2 39.3	+0.2808	0.5258	0.2290	+59	−24
Leonis	6.5	2.13	5.3	14 43.8	11 8.6	+ 3 39.6	+0.0710	0.5256	0.2305	+47	−34
Leonis	5.6	+2.15	−5.7	+14 24.6	13 54.9	+ 6 20.7	−0.2350	0.5252	−0.2342	+31	−51

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

APRIL.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
ν Leonis	5.0	+2.20	− 7.1	+12 50.9	23 20 58.8	−10 48.9	+0.2852	0.5244	−0.2432	+29	−55
A Leonis	4.6	2.20	8.4	10 24.7	24 1 43.4	− 6 13.1	+1.0895	0.5241	0.2486	+90	+19
α Leonis	1.3	2.23	7.8	12 22.9	1 56.6	− 6 0.4	−1.0164	0.5240	0.2489	−12	−78
44 Leonis	5.9	2.27	9.8	9 12.9	10 11.8	+ 1 59.3	+0.1848	0.5240	0.2574	+54	−32
45 Leonis	5.8	2.29	9.6	10 11.6	11 21.6	+ 3 6.9	−1.1285	0.5240	0.2585	−20	−80
ρ Leonis	3.8	+2.31	−10.0	+ 9 44.5	13 53.0	+ 5 33.5	−1.3144	0.5240	−0.2608	−37	−80
48 Leonis	5.2	2.28	10.8	7 23.3	14 52.4	+ 6 31.0	+0.8576	0.5242	0.2617	+90	+ 3
49 Leonis	5.7	2.31	10.3	9 5.2	14 58.6	+ 6 37.1	−0.9230	0.5242	0.2618	− 6	−81
37 Sextantis	6.3	2.32	11.6	6 49.1	20 22.7	+11 50.9	−0.0097	0.5247	0.2662	+43	−43
56 Leonis	6.1	2.36	12.1	6 38.2	25 1 12.7	− 7 28.3	−1.1158	0.5253	0.2696	−18	−83
d Leonis	5.0	+2.35	−13.0	+ 4 4.2	3 25.5	− 5 19.6	+0.9144	0.5258	−0.2709	+90	+ 5
75 Leonis	5.4	2.40	14.3	2 28.5	11 31.2	+ 2 30.6	+0.3283	0.5276	0.2752	+62	−20
76 Leonis	6.0	2.40	14.4	2 6.8	12 18.5	+ 3 16.4	+0.4788	0.5278	0.2756	+72	−19
79 Leonis	5.5	2.42	14.7	+ 1 52.2	14 46.3	+ 5 39.5	+0.0446	0.5286	0.2765	+40	−41
υ Leonis	4.5	2.44	15.7	− 0 21.5	20 57.2	+11 38.5	+0.5878	0.5306	0.2783	+80	−13
78 B. Virginis	6.5	+2.53	−17.9	− 5 15.1	26 14 29.6	+ 4 36.6	+0.6128	0.5388	−0.2781	+81	−12
χ Virginis	4.8	2.61	18.8	7 32.0	27 1 54.4	− 8 21.8	−0.2634	0.5458	0.2735	+28	−58
ψ Virginis	5.0	2.65	19.3	9 5.0	8 39.3	− 1 50.9	−0.5547	0.5505	0.2690	+13	−78
49 Virginis	5.2	2.69	19.5	10 17.5	14 36.4	+ 3 53.7	−0.9421	0.5549	0.2638	− 9	−90
i Virginis	5.7	2.74	19.8	12 16.3	22 43.4	+11 43.2	−1.0912	0.5614	0.2549	−21	−90
75 Virginis	5.6	+2.76	−19.9	−14 55.9	28 1 18.9	− 9 47.0	+0.8742	0.5636	−0.2516	+75	+ 4
83 Virginis	5.6	2.80	19.9	15 45.4	6 11.7	− 5 5.0	+0.4751	0.5676	0.2447	+64	−18
85 Virginis	6.1	2.80	19.8	15 20.8	6 39.2	− 4 38.5	−0.0413	0.5680	0.2440	+35	−40
43 H. Virginis	5.5	2.88	19.4	17 48.6	18 49.5	+ 7 4.1	−0.4699	0.5786	0.2231	+11	−73
231 G. Virginis	6.4	2.88	19.4	18 11.8	19 29.2	+ 7 42.3	−0.2385	0.5793	0.2218	+22	−57
236 G. Virginis	5.7	+2.89	−19.4	−18 19.7	20 7.1	+ 8 18.7	−0.2489	0.5797	−0.2206	+22	−58
9 G. Libræ	6.5	2.94	18.9	20 4.3	29 2 31.2	− 9 32.2	+0.0904	0.5852	0.2072	+38	−38
17 G. Libræ	6.4	2.96	18.6	20 49.3	6 56.1	− 5 17.9	−0.0685	0.5889	0.1971	+28	−47
18 G. Libræ	6.1	2.96	18.5	20 58.4	7 20.2	− 4 54.7	+0.0022	0.5892	0.1961	+32	−43
43 B. Libræ	5.7	3.00	18.8	21 2.3	11 14.3	− 1 10.1	−0.6814	0.5923	0.1866	− 4	−90
47 G. Libræ	6.1	+3.00	−17.8	−21 42.4	14 41.6	+ 2 8.7	−0.6572	0.5950	−0.1778	− 4	−90
64 G. Libræ	5.8	3.02	17.4	22 5.4	18 26.6	+ 5 44.4	−0.9300	0.5978	0.1678	−21	−90
153 B. Libræ	6.3	3.06	16.4	24 12.4	30 0 40.6	+11 42.7	+0.1498	0.6021	0.1502	+35	−35
42 Libræ	5.0	3.06	16.2	23 32.8	3 19.2	− 9 45.4	−0.8826	0.6037	0.1424	−21	−90
b Scorpii	4.7	3.09	15.4	25 29.9	7 13.4	− 6 1.1	+0.4961	0.6059	0.1306	+53	−15
A Scorpii	4.6	+3.09	−15.3	−25 4.7	8 11.5	− 5 5.6	−0.0403	0.6064	−0.1276	+23	−40
31 B. Scorpii	5.4	3.08	15.3	24 17.1	8 18.3	− 4 59.0	−0.8326	0.6065	0.1273	−19	−90
3 Scorpii	5.9	3.09	15.2	24 59.8	8 34.4	− 4 43.6	−0.1689	0.6066	0.1264	+16	−54
4 Scorpii	5.7	3.10	15.1	26 1.2	8 52.2	− 4 26.5	+0.7975	0.6068	0.1255	+64	+ 2
40 B. Scorpii	5.4	3.08	15.1	24 35.5	10 0.5	− 3 21.2	−0.7450	0.6074	0.1219	−14	−90
π Scorpii	3.0	+3.10	−14.9	−25 52.5	10 5.5	− 3 16.4	+0.5035	0.6074	−0.1217	+53	−15
48 B. Scorpii	4.9	3.10	14.7	25 38.0	11 43.8	− 1 42.4	+0.0719	0.6081	0.1165	+28	−30
50 B. Scorpii	6.4	3.08	14.8	24 29.8	11 56.9	− 1 29.8	−1.0683	0.6082	0.1158	−36	−90
65 B. Scorpii	5.5	3.11	14.4	26 6.2	13 27.1	− 0 3.5	+0.3374	0.6089	0.1110	+41	−25
85 B. Scorpii	6.0	3.09	14.1	25 15.9	15 54.8	+ 2 17.8	−0.7482	0.6099	0.1030	−16	−90
σ Scorpii	3.1	+3.09	−13.7	−25 23.6	18 10.9	+ 4 28.0	−0.8484	0.6107	−0.0956	−23	−90
α Scorpii	1.2	3.10	13.1	26 14.9	21 7.5	+ 7 17.0	−0.2761	0.6116	0.0858	+ 7	−60
116 B. Scorpii	6.2	+3.11	−12.9	−26 21.4	21 50.0	+ 7 57.6	−0.2287	0.6117	−0.0834	+ 9	−57

MAY.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
134 B. Scorpii	6.4	+3.11	−12.0	−27 18.0	1 2 26.6	−11 37.9	+0.3514	0.6127	−0.0678	+39	−24
118 B. Ophiuchi	6.2	3.07	10.7	26 24.1	10 31.7	− 3 54.1	−0.9715	0.6131	0.0399	−35	−90
95 G. Ophiuchi	6.1	3.08	10.0	27 39.6	12 29.3	− 2 1.5	+0.2000	0.6129	0.0331	+28	−32
36 Oph. (*1st star*)	5.4	3.04	10.4	26 28.9	13 34.1	− 0 59.7	−0.9990	0.6128	0.0294	−38	−90
43 Ophiuchi	5.4	+3.08	− 9.2	−28 3.8	16 23.6	+ 1 42.4	+0.4964	0.6124	−0.0196	+44	−15

OCCULTATIONS, 1915.

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.				
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'
		$\Delta\alpha$	$\Delta\delta$						
		s	″	° ′	d h m	h m			
Ophiuchi	6.3	+3.03	−7.8	−27 50.8	1 23 33.1	+ 8 33.2	+0.2299	0.6104	+0.0051
Sagittarii (*var.*)	4.4	3.02	7.5	27 48.1	2 1 5.4	+10 1.5	+0.1975	0.6099	0.0103
Sagittarii	6.2	2.99	7.7	26 56.9	1 25.7	+10 20.8	−0.6469	0.6098	0.0115
Sagittarii	5.7	3.00	6.8	28 3.2	4 23.3	−10 49.3	+0.5020	0.6085	0.0216
Scorpii	5.8	3.01	6.4	28 45.1	5 5.3	−10 9.1	+1.2130	0.6082	0.0239
Sagittarii	4.7	+2.97	−5.8	−28 28.1	8 31.3	− 6 51.9	+1.0348	0.6064	+0.0355
Sagittarii	6.3	2.94	5.3	28 19.1	11 55.7	− 3 36.3	+1.0261	0.6045	0.0466
Sagittarii	4.7	2.91	5.5	27 4.5	12 11.6	− 3 21.1	−0.2025	0.6043	0.0476
Sagittarii	6.1	2.93	4.8	28 28.2	13 37.6	− 1 58.8	+1.2637	0.6034	0.0522
Sagittarii	6.2	2.86	4.9	26 41.2	15 46.1	+ 0 4.3	−0.4005	0.6020	0.0592
Sagittarii	6.3	+2.87	−4.8	−26 48.6	15 54.4	+ 0 12.3	−0.2694	0.6019	+0.0596
Sagittarii	6.5	2.86	4.8	26 38.3	16 13.3	+ 0 30.4	−0.4228	0.6017	0.0606
Sagittarii	3.3	2.81	3.5	27 4.8	22 27.0	+ 6 28.4	+0.4588	0.5971	0.0800
Sagittarii	2.1	2.75	3.0	26 24.3	3 2 5.7	+ 9 58.1	+0.0917	0.5941	0.0910
Sagittarii	6.4	2.70	3.2	24 59.5	3 17.3	+11 6.7	−1.2202	0.5931	0.0946
Sagittarii	6.4	+2.70	−3.0	−25 3.7	4 4.6	+11 52.2	−1.0747	0.5924	+0.0969
Sagittarii	5.8	2.68	2.9	24 57.9	4 51.8	−11 22.6	−1.0949	0.5918	0.0992
Sagittarii	6.1	2.66	2.6	24 47.5	7 5.2	− 9 14.6	−1.0444	0.5897	0.1056
Sagittarii	5.9	2.66	1.8	26 3.0	8 59.8	− 7 24.6	+0.4340	0.5880	0.1110
Sagittarii	4.9	2.64	1.9	25 24.3	9 54.2	− 6 32.5	−0.1174	0.5871	0.1135
Sagittarii	6.1	+2.62	−2.2	−24 19.5	9 55.3	− 6 31.4	−1.2067	0.5871	+0.1135
Sagittarii	4.9	2.58	1.4	24 40.5	13 43.4	− 2 52.3	−0.4034	0.5835	0.1238
Sagittarii	5.5	2.56	1.6	24 7.8	13 49.2	− 2 46.8	−0.9436	0.5834	0.1241
Sagittarii	5.8	2.53	0.6	24 54.4	17 59.2	+ 1 13.4	+0.3831	0.5794	0.1350
Sagittarii	4.7	2.53	0.5	25 4.3	18 15.2	+ 1 28.7	+0.5882	0.5791	0.1356
Sagittarii	6.3	+2.48	−0.7	−23 37.3	19 31.6	+ 2 42.1	−0.7116	0.5778	+0.1388
Sagittarii	6.1	2.48	−0.7	23 37.5	19 38.6	+ 2 48.8	−0.6926	0.5777	0.1391
Sagittarii	6.3	2.42	+0.3	24 9.2	4 1 23.8	+ 8 20.8	+0.6868	0.5718	0.1530
Sagittarii	6.1	2.36	0.5	22 58.3	4 20.1	+11 10.4	−0.0607	0.5688	0.1597
Sagittarii	6.5	2.34	0.7	22 50.1	5 18.6	−11 53.2	−0.0441	0.5678	0.1619
Capricorni	5.7	+2.26	+1.3	−22 4.4	11 19.4	− 6 5.8	+0.1880	0.5615	+0.1747
Capricorni	6.4	2.01	2.0	18 21.0	5 1 1.5	+ 7 7.0	−1.0844	0.5475	0.2000
Capricorni	5.7	1.98	2.3	18 14.7	3 28.7	+ 9 29.2	−0.6984	0.5451	0.2039
Capricorni	6.2	1.98	3.0	19 21.9	5 38.2	+11 34.2	+0.9081	0.5430	0.2073
Capricorni	6.5	1.94	2.5	17 51.7	6 13.8	−11 51.4	−0.5300	0.5424	0.2082
Capricorni	4.2	+1.91	+2.7	−17 34.2	8 33.2	− 9 36.7	−0.3461	0.5402	+0.2117
Capricorni	6.1	1.86	3.3	17 41.8	12 47.7	− 5 30.7	+0.6955	0.5362	0.2175
URANUS	6.0	. . .	. . .	16 48.5	14 0.1	− 4 20.6	+0.0329	0.5346	0.2190
Capricorni	6.3	1.85	3.5	17 49.1	14 15.9	− 4 5.4	+1.1451	0.5348	0.2195
Capricorni	4.3	1.81	3.5	17 11.8	16 8.7	− 2 16.2	+0.9109	0.5331	0.2219
Capricorni	5.1	+1.66	+3.5	−14 25.6	6 1 25.1	+ 6 42.2	+0.1179	0.5252	+0.2325
Capricorni	6.0	1.66	3.8	14 47.3	2 9.1	+ 7 24.9	+0.6690	0.5246	0.2333
Capricorni	5.8	1.66	4.0	15 8.3	2 36.5	+ 7 51.4	+1.1448	0.5242	0.2337
B. Capricorni	6.1	1.60	3.6	13 7.1	5 24.1	+10 33.8	−0.3247	0.5220	0.2365
Capricorni	5.2	1.60	4.0	13 57.1	7 9.5	−11 44.1	+0.9709	0.5207	0.2381
Aquarii	5.4	+1.47	+4.2	−11 58.9	15 51.6	− 3 18.0	+0.9968	0.5145	+0.2452
B. Aquarii	6.0	1.41	3.7	9 27.8	19 3.7	− 0 11.7	−0.8872	0.5124	0.2474
Aquarii	6.3	1.28	4.3	8 20.3	7 6 10.5	+10 35.4	+0.6997	0.5060	0.2535
Aquarii	6.4	1.25	4.2	7 24.4	8 44.4	−10 55.2	+0.3570	0.5048	0.2546
B. Aquarii	5.8	1.17	4.1	5 26.4	15 4.2	− 4 46.3	−0.1310	0.5019	0.2568
G. Aquarii	6.3	+1.15	+4.2	− 5 15.8	16 11.7	− 3 40.7	−0.0312	0.5015	+0.2571
B. Aquarii	6.1	1.13	4.3	5 10.0	18 27.6	− 1 28.7	+0.4490	0.5006	0.2576
B. Aquarii	5.5	1.05	4.6	3 57.5	8 2 1.3	+ 5 52.2	+1.1042	0.4980	0.2589
Piscium	6.4	0.96	4.5	1 33.2	10 55.9	− 9 28.1	+0.8197	0.4959	0.2592
Piscium	5.9	0.95	4.6	− 1 42.9	12 7.4	− 8 18.6	+1.3040	0.4957	0.2592
Piscium	4.6	+0.88	+4.0	+ 1 18.8	16 27.6	− 4 5.6	−0.8553	0.4949	+0.2588

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	″	° ′	d h m	h m				°	°
21 Piscium	5.6	+0.86	+ 4.6	+ 0 36.3	8 20 31.0	− 0 8.9	+0.9620	0.4945	+0.2582	+90	+ 7
22 Piscium	5.8	0.84	4.1	2 27.5	21 53.6	+ 1 11.4	−0.6973	0.4944	0.2579	+ 7	−88
25 Piscium	6.2	0.84	4.4	1 37.2	22 30.3	+ 1 47.1	+0.3734	0.4944	0.2578	+65	−24
51 Piscium	5.6	0.66	4.7	6 29.3	9 20 7.0	− 1 12.0	+0.5579	0.4950	0.2496	+78	−14
136 B. Piscium	6.5	0.61	4.4	8 53.6	10 0 56.4	+ 3 29.5	−0.8816	0.4958	0.2468	− 3	−81
η Piscium	3.7	+0.44	+ 5.1	+14 54.6	4 3.3	+ 5 50.7	−1.0964	0.5034	+0.2245	−19	−75
101 Piscium	6.2	0.44	5.3	14 13.7	6 20.2	+ 8 3.6	+0.1653	0.5043	0.2222	+53	−30
105 Piscium	6.1	0.42	5.2	15 58.6	8 23.1	+10 3.0	−1.3140	0.5051	0.2199	−41	−74
				NEW	*MOON.*						
38 B. Aurigæ	6.5	+0.59	+ 8.4	+27 34.8	15 11 25.2	+ 9 57.2	−0.3454	0.5468	+0.0371	+24	−37
47 B. Aurigæ	6.0	0.61	8.4	27 55.6	13 43.1	−11 49.6	−0.6509	0.5472	0.0315	+ 6	−57
354 B. Tauri	6.4	0.65	8.4	27 52.5	18 46.7	− 6 56.5	−0.4648	0.5479	0.0191	+17	−43
β Tauri	1.8	0.68	8.4	28 32.3	21 8.7	− 4 39.3	−1.1640	0.5482	0.0133	−35	−61
107 B. Aurigæ	6.5	0.71	8.2	27 36.6	16 1 29.1	− 0 28.0	−0.0984	0.5484	0.0026	+38	−20
112 B. Aurigæ	5.7	+0.71	+ 8.1	+26 52.5	2 2.7	+ 0 4.5	+0.7186	0.5485	+0.0012	+90	+23
406 B. Tauri	5.6	0.77	8.2	27 56.7	8 13.0	+ 6 2.0	−0.5094	0.5486	−0.0141	+14	−45
136 Tauri	4.6	0.78	8.0	27 35.7	9 16.9	+ 7 3.7	−0.1375	0.5486	0.0167	+35	−23
415 B. Tauri	6.1	0.82	8.0	27 34.3	12 43.4	+10 23.1	−0.1828	0.5484	0.0253	+33	−26
37 Geminorum	5.7	1.06	6.3	25 29.1	17 13 13.4	+10 2.8	+0.7689	0.5445	0.0843	+90	+18
39 Geminorum	6.2	+1.08	+ 6.4	+26 11.7	14 47.9	+11 34.0	−0.1494	0.5440	−0.0880	+35	−30
40 Geminorum	6.3	1.09	6.3	26 1.9	15 6.1	+11 51.7	+0.0035	0.5439	0.0887	+44	−22
52 Geminorum	6.1	1.16	5.6	25 2.1	22 4.3	− 5 24.3	+0.4249	0.5419	0.1046	+71	− 2
A Geminorum	5.1	1.20	5.4	25 13.0	18 2 6.2	− 1 30.6	−0.2140	0.5406	0.1136	+31	−36
176 B. Geminorum	6.3	1.27	4.6	24 33.2	8 56.1	+ 5 5.7	−0.3133	0.5383	0.1284	+26	−43
181 B. Geminorum	6.0	+1.28	+ 4.6	+24 25.0	9 23.0	+ 5 31.6	−0.2227	0.5382	−0.1294	+31	−35
187 B. Geminorum	6.3	1.27	4.2	23 13.0	10 13.7	+ 6 20.7	+0.9795	0.5379	0.1312	+90	+26
κ Geminorum	3.7	1.30	4.4	24 36.2	11 49.3	+ 7 53.1	−0.7483	0.5373	0.1345	+ 1	−65
82 Geminorum	6.3	1.31	3.9	23 21.2	13 45.5	+ 9 45.5	+0.3541	0.5366	0.1385	+65	−10
5 B. Cancri	6.4	1.38	3.5	23 49.1	19 35.4	− 8 36.2	−0.9950	0.5345	0.1503	−15	−60
9 Cancri	6.2	+1.40	+ 3.0	+22 52.8	22 5.8	− 6 10.7	−0.3547	0.5335	−0.1552	+24	−48
μ Cancri	5.5	1.40	2.6	21 49.8	22 48.1	− 5 29.8	+0.6785	0.5333	0.1566	+90	+ 5
49 B. Cancri	6.0	1.45	1.8	21 1.0	19 4 47.0	+ 0 17.5	+0.5897	0.5310	0.1680	+84	− 1
η Cancri	5.5	1.51	1.2	20 43.9	10 42.2	+ 6 1.3	−0.1270	0.5288	0.1787	+37	−30
39 Cancri	6.5	1.55	0.8	20 18.5	14 16.2	+ 9 28.4	−0.3182	0.5275	0.1849	+26	−50
40 Cancri	6.5	+1.55	+ 0.7	+20 16.3	14 18.7	+ 9 30.9	−0.2866	0.5275	−0.1850	+28	−48
102 B. Cancri	6.5	1.54	0.6	19 58.3	14 24.0	+ 9 36.0	+0.0226	0.5274	0.1851	+45	−32
ε Cancri	6.3	1.54	+ 0.6	19 50.8	14 26.6	+ 9 38.5	+0.1499	0.5274	0.1852	+52	−25
δ Cancri	4.2	1.55	− 0.2	18 28.0	16 30.4	+11 38.3	+1.2538	0.5267	0.1887	+88	+42
139 B. Cancri	6.1	1.59	0.1	19 9.0	19 26.3	− 9 31.3	−0.0445	0.5257	0.1935	+41	−36
X Cancri (*var.*)	6.2	+1.59	− 0.9	+17 33.3	21 42.6	− 7 19.3	+1.2303	0.5249	−0.1972	+90	+35
227 B. Cancri	6.4	1.70	2.8	15 43.9	20 10 25.7	+ 4 59.9	+0.5504	0.5210	0.2163	+79	− 9
12 B. Leonis	6.3	1.74	2.6	16 57.1	12 32.1	+ 7 2.4	−1.2140	0.5205	0.2192	−30	−73
7 Leonis	6.2	1.77	3.9	14 45.5	17 41.2	−11 58.1	−0.0173	0.5192	0.2261	+43	−39
11 Leonis	6.5	1.78	4.0	14 43.9	18 45.2	−10 56.0	−0.2296	0.5190	0.2274	+31	−50
ψ Leonis	5.6	+1.81	− 4.4	+14 24.6	21 35.9	− 8 10.6	−0.5392	0.5184	−0.2310	+15	−60
ν Leonis	5.0	1.86	5.7	12 50.9	21 4 51.6	− 1 8.3	−0.5886	0.5172	0.2394	+13	−73
A Leonis	4.6	1.88	7.1	10 24.8	9 44.4	+ 3 35.6	+0.8065	0.5166	0.2446	+90	+ 1
α Leonis	1.3	1.90	6.4	12 22.9	9 58.0	+ 3 48.7	−1.3278	0.5166	0.2448	−40	−78
44 Leonis	5.9	1.96	8.4	9 12.9	18 27.9	−11 56.9	−0.1053	0.5161	0.2529	+38	−47
48 Leonis	5.2	+1.98	− 9.4	+ 7 23.3	23 16.9	− 7 16.7	+0.5808	0.5162	−0.2569	+80	−12
49 Leonis	5.7	2.00	8.8	9 5.2	23 23.3	− 7 10.5	−1.2247	0.5162	0.2570	−28	−81
37 Sextantis	6.3	2.03	10.2	6 49.1	22 4 57.4	− 1 46.5	−0.2933	0.5165	0.2611	+28	−59
56 Leonis	6.1	2.08	10.7	6 38.2	9 56.4	+ 3 3.4	−1.4097	0.5171	0.2642	−53	−73
d Leonis	5.0	2.08	11.8	4 4.2	12 13.2	+ 5 16.0	+0.6523	0.5175	0.2656	+86	− 9
75 Leonis	5.4	+2.15	−13.0	+ 2 28.5	20 33.9	−10 38.7	+0.0693	0.5193	−0.2695	+47	−39

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
Leonis	6.0	+2.15	−13.2	+ 2 6.8	22 21 22.7	− 9 51.4	+0.2231	0.5195	−0.2698	+56	−32
Leonis	6.3	2.16	13.9	0 35.7	23 33.4	− 7 44.7	+1.1990	0.5203	0.2706	+90	+24
Leonis	5.5	2.18	13.5	+ 1 52.2	23 55.1	− 7 23.7	−0.2134	0.5202	0.2707	+32	−55
Leonis	4.5	2.22	14.7	− 0 21.5	23 6 17.2	− 1 13.5	+0.3481	0.5224	0.2724	+63	−25
Virginis	6.5	2.38	17.3	5 15.1	24 0 19.7	− 7 45.2	+0.4089	0.5313	0.2723	+66	−22
Virginis	4.8	+2.50	−18.5	− 7 32.0	12 1.9	+ 3 33.9	−0.4506	0.5389	−0.2678	+19	−70
Virginis	6.0	2.57	19.7	11 11.6	18 55.0	+10 13.1	+1.3927	0.5440	0.2635	+72	+50
Virginis	5.0	2.58	19.1	9 5.0	18 56.2	+10 14.2	−0.7273	0.5440	0.2635	+ 3	−90
Virginis	5.2	2.65	19.5	10 17.5	25 1 0.8	− 7 53.7	−1.1019	0.5490	0.2586	−21	−90
Virginis	5.7	2.74	20.0	12 16.3	9 16.8	+ 0 4.8	−1.2285	0.5563	0.2500	−33	−90
Virginis	5.6	+2.77	−20.6	−14 55.9	11 54.9	+ 2 37.3	+0.7602	0.5587	−0.2469	+75	− 3
Virginis	5.6	2.84	20.6	15 45.5	16 52.0	+ 7 23.6	+0.3715	0.5634	0.2403	+58	−24
Virginis	6.1	2.84	20.5	15 20.8	17 19.9	+ 7 50.4	+0.1472	0.5639	0.2396	+30	−52
Virginis	5.5	3.00	20.4	17 48.6	26 5 38.4	− 4 18.8	−0.5426	0.5760	0.2193	+ 7	−78
Virginis	6.4	3.01	20.4	18 11.8	6 18.5	− 3 40.2	−0.3082	0.5766	0.2181	+19	−61
Virginis	5.7	+3.02	−20.4	−18 19.7	6 56.7	− 3 3.5	−0.3168	0.5773	−0.2169	+18	−62
Libræ	6.5	3.11	20.2	20 4.3	13 23.3	+ 3 8.1	+0.0422	0.5837	0.2039	+35	−41
Libræ	6.4	3.17	20.0	20 49.3	17 49.3	+ 7 23.5	−0.1044	0.5880	0.1940	+27	−49
Libræ	6.1	3.17	19.9	20 58.5	18 13.5	+ 7 46.8	−0.0326	0.5884	0.1931	+30	−45
Libræ	5.7	3.25	20.2	21 2.3	22 8.0	+11 31.7	−0.7057	0.5921	0.1838	− 6	−90
Libræ	6.1	+3.27	−19.2	−21 42.4	27 1 35.4	− 9 9.2	−0.6714	0.5954	−0.1751	− 5	−90
Libræ	5.8	3.31	18.7	22 5.4	5 20.1	− 5 33.8	−0.9329	0.5988	0.1653	−22	−90
Libræ	6.3	3.41	18.0	24 12.4	11 32.8	+ 0 23.2	+0.1632	0.6040	0.1479	+35	−34
Libræ	5.0	3.42	17.6	23 32.8	14 10.5	+ 2 54.2	−0.8596	0.6060	0.1402	−20	−90
Scorpii	4.7	3.49	17.0	25 29.9	18 3.1	+ 6 36.9	+0.5257	0.6088	0.1285	+54	−14
Scorpii	4.6	+3.49	−16.8	−25 4.7	19 0.7	+ 7 31.9	−0.0064	0.6095	−0.1255	+25	−44
Scorpii	5.4	3.47	16.8	24 17.1	19 7.5	+ 7 38.4	−0.7956	0.6096	0.1252	−17	−90
Scorpii	5.9	3.49	16.7	24 59.8	19 23.5	+ 7 53.8	−0.1335	0.6097	0.1244	+18	−51
Scorpii	5.7	3.51	16.7	26 1.2	19 41.1	+ 8 10.6	+0.8300	0.6099	0.1234	+64	+ 4
Scorpii	5.4	3.49	16.4	24 35.5	20 48.8	+ 9 15.4	−0.7036	0.6107	0.1199	−12	−90
Scorpii	3.0	+3.52	−16.5	−25 52.5	20 53.7	+ 9 20.0	+0.5403	0.6107	−0.1197	+54	−13
Scorpii	4.9	3.52	16.2	25 38.0	22 31.1	+10 53.2	+0.1146	0.6117	0.1145	+31	−37
Scorpii	6.4	3.51	16.1	24 29.8	22 44.1	+11 5.6	−1.0202	0.6119	0.1138	−33	−90
Scorpii	5.5	3.55	15.8	26 6.2	28 0 13.4	−11 29.0	+0.3833	0.6127	0.1090	+44	−22
Scorpii	6.0	3.55	15.4	25 16.0	2 39.4	− 9 9.4	−0.6905	0.6141	0.1011	−13	−90
Scorpii	3.1	+3.57	−15.0	−25 23.6	4 53.9	− 7 0.8	−0.7840	0.6152	−0.0936	−19	−90
Scorpii	1.2	3.60	14.4	26 14.9	7 48.2	− 4 14.2	−0.2073	0.6165	0.0839	+10	−56
Scorpii	6.2	3.61	14.2	26 21.4	8 30.1	− 3 34.1	−0.1584	0.6168	0.0815	+13	−53
Scorpii	6.4	3.66	13.2	27 18.1	13 2.7	+ 0 46.3	+0.4291	0.6183	0.0659	+43	−19
Ophiuchi	6.2	3.67	11.4	26 24.1	20 59.4	+ 8 21.7	−0.8632	0.6198	0.0379	−29	−90
Ophiuchi	6.1	+3.70	−10.9	−27 39.6	22 54.7	+10 11.9	+0.3026	0.6199	−0.0311	+33	−26
Ophi. (*1st star*)	5.4	3.66	11.2	26 28.9	23 58.3	+11 12.6	−0.8826	0.6200	0.0273	−30	−90
Ophiuchi	5.4	3.72	9.9	28 3.9	29 2 44.4	−10 8.7	+0.6053	0.6199	0.0175	+52	− 9
Ophiuchi	6.0	3.67	9.3	26 12.5	5 42.3	− 7 18.7	−1.2510	0.6195	−0.0069	−61	−76
Ophiuchi	6.3	3.72	8.2	27 50.8	9 44.5	− 3 27.3	+0.3575	0.6187	+0.0075	+35	−23
Sagittarii (*var.*)	4.4	+3.72	− 7.8	−27 48.1	11 14.7	− 2 1.2	+0.3290	0.6182	+0.0128	+34	−25
Sagittarii	6.2	3.69	7.8	26 56.9	11 34.5	− 1 42.2	−0.5054	0.6181	0.0139	+11	−78
Sagittarii	5.7	3.72	6.9	28 3.2	14 27.9	+ 1 3.5	+0.6371	0.6172	0.0241	+55	− 7
Sagittarii	4.7	3.72	5.9	28 28.1	18 29.8	+ 4 54.6	+1.1722	0.6154	0.0381	+61	+35
Sagittarii	6.3	3.71	5.1	28 19.1	21 48.9	+ 8 5.0	+1.1706	0.6137	0.0495	+62	+35
Sagittarii	4.7	+3.67	− 5.1	−27 4.5	22 4.4	+ 8 19.8	−0.0421	0.6135	+0.0504	+16	−46
Sagittarii	6.2	3.64	4.3	26 41.2	30 1 33.3	+11 39.6	−0.2298	0.6114	0.0621	+ 8	−57
Sagittarii	6.3	3.65	4 2	26 48.6	1 41.3	+11 47.2	−0.1001	0.6114	0.0625	+14	−49
Sagittarii	6.5	3.64	4.2	26 38.3	1 59.7	−11 55.2	−0.2508	0.6112	0.0635	+ 7	−59
Sagittarii	3.3	3.62	2.6	27 4.8	8 3.1	− 6 7.5	+0.6319	0.6069	0.0833	+58	− 7
Sagittarii	2.1	+3.57	− 1.8	−26 24.2	11 35.6	− 2 44.1	+0.2771	0.6040	+0.0944	+37	−28

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

MAY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S
		s	″	° ′	d h m	h m				°	°
162 B. Sagittarii	6.4	+3.52	−1.8	−24 59.5	30 12 45.1	− 1 37.5	−1.0138	0.6031	+0.0980	−34	−90
127 B. Sagittarii	6.4	3.52	1.6	25 3.7	13 31.0	− 0 53.6	−0.8690	0.6024	0.1003	−24	−90
172 B. Sagittarii	5.8	3.51	1.6	24 57.9	14 17.0	− 0 9.5	−0.8870	0.6017	0.1026	−24	−90
189 B. Sagittarii	6.1	3.49	1.0	24 47.5	16 26.4	+ 1 54.5	−0.8327	0.5998	0.1091	−20	−90
201 B. Sagittarii	5.9	3.51	0.3	26 3.0	18 17.6	+ 3 41.0	+0.6280	0.5981	0.1146	+59	− 8
ψ Sagittarii	4.9	+3.49	−0.2	−25 24.3	19 10.4	+ 4 31.6	+0.0864	0.5973	+0.1171	+29	−38
208 B. Sagittarii	6.1	3.46	−0.4	24 19.5	19 11.4	+ 4 32.7	−0.9870	0.5972	0.1172	−29	−90
χ Sagittarii	4.9	3.43	+0.5	24 40.5	22 52.8	+ 8 4.9	−0.1881	0.5937	0.1276	+16	−55
49 Sagittarii	5.5	3.42	0.4	24 7.8	22 58.5	+ 8 10.4	−0.7201	0.5936	0.1279	−12	−90
51 Sagittarii	5.8	3.40	1.5	24 54.3	31 3 0.9	−11 57.0	+0.5945	0.5894	0.1388	+60	−10
h Sagittarii	4.7	+3.41	+1.6	−25 4.3	3 16.4	−11 42.2	+0.7970	0.5892	+0.1395	+65	+ 2
53 Sagittarii	6.3	3.35	1.6	23 37.3	4 30.5	−10 31.1	−0.4809	0.5879	0.1428	+ 2	−75
274 B. Sagittarii	6.1	3.35	1.6	23 37.4	4 37.3	−10 24.5	−0.4620	0.5878	0.1431	+ 3	−73
308 B. Sagittarii	6.3	3.31	2.8	24 9.2	10 11.9	− 5 3.2	+0.9066	0.5819	0.1571	+66	+ 0
329 B. Sagittarii	6.1	3.25	3.3	22 58.2	13 2.8	− 2 19.0	+0.1754	0.5788	0.1638	+38	−34
336 B. Sagittarii	6.5	+3.23	+3.5	−22 50.0	13 59.6	− 1 24.4	+0.1934	0.5777	+0.1660	+40	−31
4 Capricorni	5.7	+3.15	+4.5	−22 4.3	19 49.3	+ 4 12.0	+0.4315	0.5713	+0.1789	+54	−20

JUNE.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S
81 B. Capricorni	6.4	+2.92	+5.9	−18 20.9	1 9 6.7	− 7 0.0	−0.8022	0.5566	+0.2041	− 8	−90
19 Capricorni	5.7	2.88	6.3	18 14.6	11 29.5	− 4 42.2	−0.4190	0.5540	0.2080	+13	−60
20 Capricorni	6.2	2.89	7.0	19 21.8	13 35.3	− 2 40.9	+1.1662	0.5517	0.2114	+71	+27
21 Capricorni	6.5	2.85	6.6	17 51.7	14 9.9	− 2 7.5	−0.2499	0.5511	0.2122	+22	−55
θ Capricorni	4.2	2.82	6.9	17 34.2	16 25.3	+ 0 3.2	−0.0661	0.5487	0.2156	+32	−47
114 B. Capricorni	6.1	+2.77	+7.6	−17 41.7	20 32.6	+ 4 2.0	+0.9651	0.5444	+0.2215	+72	+10
29 Capricorni	5.5	2.72	7.0	15 31.4	20 51.2	+ 4 19.9	−1.1996	0.5440	0.2219	−33	−90
URANUS	6.0	. . .	. . .	16 48.9	21 46.9	+ 5 13.8	+0.3355	0.5436	0.2233	+54	−25
ι Capricorni	4.3	2.72	8.0	17 11.7	23 47.9	+ 7 10.6	+1.1809	0.5412	0.2257	+73	+27
42 Capricorni	5.1	2.55	8.2	14 25.5	2 8 49.5	− 8 5.8	+0.4069	0.5325	0.2360	+61	−22
44 Capricorni	6.0	+2.55	+8.6	−14 47.2	9 32.3	− 7 24.3	+0.9513	0.5318	+0.2367	+75	+ 5
151 B. Capricorni	6.1	2.49	8.5	13 7.0	12 42.4	− 4 20.3	−0.0271	0.5290	0.2398	+38	−45
μ Capricorni	5.2	2.49	9.0	13 57.0	14 25.2	− 2 40.8	+1.2526	0.5275	0.2414	+76	+32
e Aquarii	5.4	2.35	9.4	11 58.8	22 54.9	+ 5 32.9	+1.2831	0.5205	0.2480	+78	+34
150 B. Aquarii	6.0	2.28	8.9	9 27.7	3 2 2.7	+ 8 34.9	−0.5772	0.5182	0.2500	+11	−80
186 B. Aquarii	6.1	+2.16	+8.7	− 6 59.2	9 19.4	− 8 21.7	−1.3494	0.5131	+0.2540	−43	−83
167 G. Aquarii	6.3	2.13	9.7	8 20.2	12 55.7	− 4 51.8	+0.9929	0.5109	0.2555	+82	+10
67 Aquarii	6.4	2.10	9.6	7 24.3	15 26.6	− 2 25.4	+0.6536	0.5093	0.2565	+81	−10
252 B. Aquarii	5.8	2.01	9.5	5 26.3	21 39.7	+ 3 36.8	+0.1693	0.5060	0.2582	+52	−34
197 G. Aquarii	6.3	2.00	9.5	5 15.7	22 46.0	+ 4 41.1	+0.2679	0.5054	0.2585	+57	−29
263 B. Aquarii	6.1	+1.97	+9.6	− 5.10.0	4 0 59.7	+ 6 50.9	+0.7428	0.5043	+0.2589	+82	− 5
293 B. Aquarii	5.5	1.88	9.8	3 57.4	8 26.4	− 9 55.2	+1.3891	0.5012	0.2597	+78	+40
13 Piscium	6.4	1.76	9.7	− 1 33.2	17 14.0	− 1 22.6	+1.1016	0.4983	0.2595	+88	+17
λ Piscium	4.6	1.68	9.1	+ 1 18.9	22 41.9	+ 3 56.1	−0.5667	0.4970	0.2587	+14	−78
21 Piscium	5.6	1.66	9.7	0 36.4	5 2 42.9	+ 7 50.4	+1.2348	0.4962	0.2579	+90	+27
22 Piscium	5.8	+1.63	+9.1	+ 2 27.6	4 4.7	+ 9 10.0	−0.4158	0.4960	+0.2575	+22	−67
25 Piscium	6.2	1.63	9.4	1 37.2	4 41.0	+ 9 45.2	+0.6478	0.4959	0.2574	+85	−10
51 Piscium	5.6	1.41	9.1	6 29.3	6 2 8.7	+ 6 37.2	+0.8030	0.4953	0.2481	+90	0
136 B. Piscium	6.5	1.35	8.5	8 53.6	6 56.8	+11 17.2	−0.6393	0.4958	0.2452	+10	−80
75 Piscium	6.3	1.23	8.2	12 30.2	20 40.7	+ 0 38.1	−1.3009	0.4984	0.2348	−37	−77
η Piscium	3.7	+1.13	+8.1	+14 54.6	7 10 0.4	−10 24.9	−0.9064	0.5025	+0.2222	− 6	−75
101 Piscium	6.2	1.12	8.4	14 13.8	12 17.3	− 8 11.8	+0.3487	0.5033	0.2198	+63	−20
105 Piscium	6.1	1.10	8.0	15 58.6	14 20.2	− 6 12.5	−1.1329	0.5041	0.2175	−22	−74
4 Arietis	5.8	1.07	8.0	16 32.1	18 48.3	− 1 52.1	−0.7892	0.5059	0.2124	+ 1	−73
ι Arietis	5.1	1.04	7.9	17 24.3	23 35.3	+ 2 46.6	−0.7502	0.5080	0.2066	+ 3	−73
35 B. Arietis	6.4	+1.02	+7.9	+17 50.8	8 2 53.1	+ 5 58.5	−0.5657	0.5094	+0.2024	+13	−67

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
Arietis	6.5	+1.01	+ 8.1	+17 37.6	8 4 58.9	+ 8 0.6	+0.0996	0.5104	+0.1996	+49	−30
Arietis	6.4	1.01	8.2	16 49.7	5 49.1	+ 8 49.4	+1.1506	0.5108	0.1985	+90	+30
Arietis	5.9	1.00	7.7	19 6.1	6 26.2	+ 9 25.4	−1.2453	0.5111	0.1976	−34	−71
Arietis	5.6	0.97	7.8	19 30.6	10 16.8	−10 50.9	−0.9495	0.5129	0.1923	−10	−70
Arietis	6.2	0.95	8.0	19 28.9	16 37.8	− 4 41.4	+0.2751	0.5161	0.1830	+59	−19
Arietis	5.4	+0.92	+ 7.7	+21 35.8	20 43.3	− 0 43.3	−1.3376	0.5182	+0.1766	−55	−65
Arietis	5.7	0.92	8.1	19 39.1	22 31.0	+ 1 1.1	+1.1359	0.5191	0.1738	+90	+32
Arietis (*mean*)	4.6	0.89	8.1	21 0.2	9 6 50.7	+ 9 5.3	+1.0260	0.5234	0.1599	+90	+25
Arietis	5.8	0.85	7.7	24 25.6	18 58.9	− 3 9.4	−0.9720	0.5297	0.1376	−14	−66
Tauri	5.9	0.84	7.8	24 10.9	23 49.8	+ 1 32.2	−0.0568	0.5322	+0.1281	+40	−30
				NEW	*MOON.*						
Geminorum	5.8	+1.09	+ 4.8	+24 16.4	14 2 48.5	+ 1 9.4	+1.2147	0.5441	−0.1045	+86	+49
Geminorum	6.1	1.11	4.9	25 2.1	3 49.4	+ 2 8.2	+0.2700	0.5438	0.1067	+60	−10
Geminorum	5.1	1.13	4.6	25 13.0	7 51.0	+ 6 1.7	−0.3767	0.5424	0.1157	+22	−45
Geminorum	6.3	+1.18	+ 4.1	+24 33.2	14 40.5	−11 22.5	−0.4882	0.5399	−0.1304	+16	−53
Geminorum	6.0	1.18	4.0	24 25.0	15 7.4	−10 56.5	−0.3983	0.5397	0.1313	+21	−48
Geminorum	6.3	1.17	3.8	23 13.0	15 58.1	−10 7.5	+0.8038	0.5394	0.1331	+90	+15
Geminorum	3.7	1.20	3.9	24 36.2	17 33.7	− 8 35.0	−0.9288	0.5387	0.1364	−11	−65
Geminorum	6.3	1.20	3.5	23 21.2	19 29.9	− 6 42.7	+0.1718	0.5380	0.1404	+53	−19
Cancri	6.4	+1.25	+ 3.2	+23 49.1	15 1 20.0	− 1 4.2	−1.1894	0.5356	−0.1521	−32	−66
Cancri	6.2	1.26	2.9	22 52.8	3 50.6	+ 1 21.5	−0.5522	0.5345	0.1570	+13	−60
Cancri	5.5	1.25	2.5	21 49.8	4 32.9	+ 2 2.4	+0.4821	0.5342	0.1584	+74	− 5
Cancri	6.0	1.29	1.8	21 1.0	10 32.6	+ 7 50.5	+0.3840	0.5317	0.1696	+67	−12
Cancri	5.5	1.33	1.3	20 43.9	16 29.1	−10 24.4	−0.3437	0.5291	0.1801	+25	−51
Cancri	6.5	+1.36	+ 0.9	+20 18.5	20 4.0	− 6 56.3	−0.5408	0.5276	−0.1862	+14	−62
Cancri	6.5	1.36	0.9	20 16.4	20 6.5	− 6 53.9	−0.5091	0.5275	0.1863	+16	−61
Cancri	6.5	1.35	0.8	19 58.3	20 11.8	− 6 48.8	−0.1990	0.5275	0.1864	+32	−43
Cancri	6.3	1.35	0.8	19 50.8	20 14.4	− 6 46.3	−0.0713	0.5275	0.1865	+39	−37
Cancri	4.2	1.35	0.2	18 28.0	22 18.8	− 4 45.8	+1.0339	0.5267	0.1899	+90	+23
Cancri	6.1	+1.39	+ 0.2	+19 9.0	16 1 15.7	− 1 54.5	−0.2734	0.5254	−0.1946	+28	−49
Cancri (*var.*)	6.2	1.39	− 0.4	17 33.3	3 32.9	+ 0 18.4	+1.0040	0.5245	0.1982	+90	+20
Cancri	6.4	1.47	2.1	15 43.9	16 22.1	−11 16.3	+0.3063	0.5197	0.2167	+61	−21
Leonis	6.2	1.52	3.0	14 45.5	23 42.3	− 4 9.6	−0.2723	0.5173	0.2260	+29	−53
Leonis	6.5	1.53	3.1	14 43.9	17 0 47.0	− 3 6.8	−0.4871	0.5169	0.2273	+18	−65
Leonis	5.6	+1.56	− 3.5	+14 24.6	3 39.8	− 0 19.2	−0.8017	0.5161	−0.2307	+ 1	−76
Leonis	5.8	1.54	4.2	12 12.1	5 1.8	+ 1 0.3	+1.2480	0.5157	0.2322	+90	+34
Leonis	6.4	1.54	4.4	11 57.6	5 33.7	+ 1 31.2	+1.3814	0.5156	0.2328	+73	+54
Leonis	5.0	1.60	4.6	12 51.0	11 1.5	+ 6 49.1	−0.8579	0.5143	0.2387	− 3	−77
Leonis	4.6	1.62	5.8	10 24.8	15 58.9	+11 37.6	+0.5458	0.5132	0.2435	+76	−13
Leonis	5.9	+1.69	− 7.0	+ 9 12.9	18 0 51.6	− 3 45.7	−0.3784	0.5120	−0.2512	+24	−62
Leonis	5.2	1.71	8.0	7 23.4	5 46.3	+ 1 0.2	+0.3131	0.5116	0.2548	+61	−26
Sextantis	6.3	1.77	8.7	6 49.1	11 33.9	+ 6 37.5	−0.5714	0.5114	0.2586	+14	−77
Leonis	5.0	1.82	10.2	4 4.3	18 59.6	−10 10.1	+0.3851	0.5117	0.2626	+65	−23
Leonis	5.7	1.82	11.1	2 24.9	22 15.9	− 6 59.6	+1.2616	0.5121	0.2640	+90	+30
Leonis	5.4	+1.89	−11.5	+ 2 28.5	19 3 32.7	− 1 52.2	−0.2030	0.5129	−0.2660	+33	−54
Leonis	6.0	1.89	11.6	2 6.8	4 22.8	− 1 3.7	−0.0469	0.5130	0.2662	+41	−46
Leonis	6.3	1.90	12.4	0 35.7	6 36.9	+ 1 6.4	+0.9428	0.5135	0.2668	+90	+ 6
Leonis	5.5	1.92	11.9	+ 1 52.3	6 59.1	+ 1 27.9	−0.4881	0.5135	0.2670	+18	−72
Leonis •	4.5	1.97	13.1	− 0 21.5	13 31.7	+ 7 48.7	+0.0842	0.5152	0.2682	+48	−39
Virginis	6.5	+2.15	−16.0	− 5 15.1	20 8 6.2	+ 1 48.9	+0.1622	0.5228	−0.2671	+51	−34
Virginis	4.8	2.29	17.3	7 32.0	20 10.6	−10 29.7	−0.6954	0.5300	0.2623	+ 6	−90
Virginis	6.0	2.37	18.8	11 11.6	21 3 17.0	− 3 37.2	+1.1873	0.5350	0.2579	+79	+25
Virginis	5.0	2.38	18.0	9 5.0	3 18.2	− 3 36.1	−0.9659	0.5350	0.2579	−10	−90
Virginis	5.2	2.46	18.6	10 17.5	9 34.6	+ 2 27.9	−1.3361	0.5398	0.2529	−43	−83
Virginis	5.6	+2.63	−20.1	−14 55.9	20 49.6	−10 40.2	+0.5753	0.5495	−0.2412	+70	−13

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.						
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time. d	Washington Mean Time. h m	Hour Angle, *H*	*Y*	*x*′	*y*′	N. S
		s	″	° ′	d	h m	h m				°
83 Virginis	5.6	+2.71	−20.2	−15 45.5	22	1 56.0	− 5 44.5	+0.1903	0.5542	−0.2346	+47 −3
85 Virginis	6.1	2.71	20.1	15 20.8		2 24.7	− 5 16.8	−0.3352	0.5547	0.2340	+20 −6
43 H. Virginis	5.5	2.92	20.4	17 48.6		15 5.5	+ 6 56.4	−0.7098	0.5672	0.2141	− 2 −9
231 G. Virginis	6.4	2.94	20.4	18 11.8		15 46.7	+ 7 36.1	−0.4706	0.5679	0.2129	+11 −7
236 G. Virginis	5.7	2.95	20.4	18 19.7		16 26.0	+ 8 13.9	−0.4779	0.5685	0.2117	+10 −7
9 G. Libræ	6.5	+3.07	−20.4	−20 4.3		23 3.5	− 9 23.6	−0.0993	0.5753	−0.1989	+28 −
17 G. Libræ	6.4	3.15	20.3	20 49.3	23	3 36.6	− 5 1.1	−0.2378	0.5799	0.1893	+19 −5
18 G. Libræ	6.1	3.16	20.2	20 58.5		4 1.4	− 4 37.2	−0.1641	0.5803	0.1884	+23 −5
43 B. Libræ	5.7	3.26	20.7	21 2.3		8 1.8	− 0 46.4	−0.8363	0.5843	0.1793	−13 −9
47 G. Libræ	6.1	3.30	19.6	21 42.4		11 34.3	+ 2 37.7	−0.7931	0.5879	0.1708	−12 −9
64 G. Libræ	5.8	+3.36	−19.2	−22 5.4		15 24.3	+ 6 18.4	−1.0485	0.5916	−0.1612	−30 −9
153 B. Libræ	6.3	3.50	18.8	24 12.4		21 45.0	−11 36.5	+0.0744	0.5974	0.1442	+31 −3
42 Libræ	5.0	3.52	18.3	23 32.9	24	0 25.8	− 9 2.3	−0.9522	0.5998	0.1366	−20 −9
b Scorpii	4.7	3.62	18.0	25 29.9		4 22.8	− 5 15.3	+0.4554	0.6030	0.1251	+50 −1
A Scorpii	4.6	3.63	17.7	25 4.7		5 21.4	− 4 19.2	−0.0793	0.6038	0.1221	+20 −4
31 B. Scorpii	5.4	+3.62	−17.6	−24 17.1		5 28.3	− 4 12.6	−0.8751	0.6039	−0.1218	−22 −9
3 Scorpii	5.9	3.63	17.6	24 59.8		5 44.6	− 3 57.0	−0.2065	0.6041	0.1210	+14 −3
4 Scorpii	5.7	3.66	17.8	26 1.3		6 2.5	− 3 39.8	+0.7661	0.6043	0.1201	+64
40 B. Scorpii	5.4	3.64	17.3	24 35.5		7 11.4	− 2 33.8	−0.7781	0.6052	0.1166	−17 −9
π Scorpii	3.0	3.68	17.5	25 52.5		7 16.4	− 2 29.1	+0.4766	0.6053	0.1164	+50 −1
48 B. Scorpii	4.9	+3.68	−17.2	−25 38.0		8 55.4	− 0 54.3	+0.0511	0.6065	−0.1113	+26 −4
50 B. Scorpii	6.4	3.67	16.9	24 29.8		9 8.6	− 0 41.7	−1.0925	0.6066	0.1106	−38 −9
65 B. Scorpii	5.5	3.73	16.9	26 6.2		10 39.3	+ 0 45.1	+0.3259	0.6078	0.1059	+41 −2
85 B. Scorpii	6.0	3.74	16.2	25 16.0		13 7.5	+ 3 7.0	−0.7504	0.6094	0.0980	−17 −9
σ Scorpii	3.1	3.78	15.8	25 23.6		15 24.0	+ 5 17.5	−0.8390	0.6109	0.0907	−23 −9
α Scorpii	1.2	+3.84	−15.3	−26 14.9		18 20.6	+ 8 6.4	−0.2514	0.6126	−0.0810	− 8 −5
116 B. Scorpii	6.2	3.85	15.2	26 21.5		19 3.0	+ 8 47.0	−0.2005	0.6130	0.0787	+10 −5
134 B. Scorpii	6.4	3.94	14.2	27 18.1		23 38.6	−10 49.5	+0.4009	0.6151	0.0632	+41 −21
118 B. Ophiuchi	6.2	4.00	12.2	26 24.1	25	7 39.5	− 3 9.9	−0.8785	0.6178	0.0355	−30 −9
95 G. Ophiuchi	6.1	4.06	11.8	27 39.7		9 35.5	− 1 19.1	+0.2958	0.6182	0.0287	+33 −26
36 Ophi. (*1st star*)	5.4	+4.01	−12.0	−26 28.9		10 39.5	− 0 17.9	−0.8907	0.6183	−0.0250	−31 −9
43 Ophiuchi	5.4	4.11	10.8	28 3.9		13 26.4	+ 2 21.5	+0.6077	0.6187	0.0151	+53 − 9
151 G. Ophiuchi	6.0	4.07	9.9	26 12.5		16 25.0	+ 5 12.2	−1.2456	0.6188	−0.0046	−60 −7
163 G. Ophiuchi	6.3	4.15	8.8	27 50.8		20 27.7	+ 9 4.1	+0.3746	0.6186	+0.0097	+36 −2
X Sagittarii (*var.*)	4.4	4.16	8.4	27 48.1		21 58.0	+10 30.3	+0.3493	0.6184	0.0150	+35 −2
4 G. Sagittarii	6.2	+4.14	− 8.3	−26 56.9		22 17.8	+10 49.3	−0.4848	0.6183	+0.0162	− 9 −70
10 G. Sagittarii	5.7	4.19	7.5	28 3.3	26	1 11.2	−10 25.0	+0.6645	0.6178	0.0263	+57 − 5
38 B. Sagittarii	4.7	4.23	6.3	28 28.1		5 12.7	− 6 34.2	+1.2077	0.6167	0.0404	+62 +40
48 G. Sagittarii	6.3	4.24	5.5	28 19.1		8 31.2	− 3 24.5	+1.2125	0.6154	0.0518	+62 +41
66 B. Sagittarii	4.7	4.19	5.3	27 4.5		8 46.6	− 3 9.8	+0.0022	0.6153	0.0527	+19 −43
68 G. Sagittarii	6.2	+4.19	− 4.3	−26 41.2		12 14.4	+ 0 8.9	−0.1773	0.6137	+0.0645	+10 −54
69 G. Sagittarii	6.3	4.19	4.2	26 48.6		12 22.4	+ 0 16.5	−0.0477	0.6137	0.0649	+17 −49
86 B. Sagittarii	6.5	4.18	4.2	26 38.3		12 40.8	+ 0 34.2	−0.1973	0.6135	0.0660	+ 9 −55
126 B. Sagittarii	5.7	4.14	2.5	25 5.9		18 25.4	+ 6 3.7	−1 2837	0.6102	0.0850	−63 −6
φ Sagittarii	3.3	4.21	2.4	27 4.8		18 41.6	+ 6 19.3	+0.6957	0.6100	0.0858	+62 − 4
σ Sagittarii	2.1	+4.18	− 1.4	−26 24.2		22 12.3	+ 9 40.8	+0.3497	0.6076	+0.0971	+41 −24
162 B. Sagittarii	6.4	4.13	1.1	24 59.5		23 21.1	+10 46.7	−0.9331	0.6068	0.1007	−27 −90
127 G. Sagittarii	6.4	4.14	0.8	25 3.7	27	0 6.5	+11 30.1	−0.7869	0.6063	0.1030	−18 −90
172 B. Sagittarii	5.8	4.13	0.8	24 57.9		0 52.0	−11 46.3	−0.8034	0.6057	0.1054	−19 −90
189 B. Sagittarii	6.1	4.12	− 0.1	24 47.5		3 0.1	− 9 43.6	−0.7444	0.6040	0.1119	−15 −90
201 B. Sagittarii	5.9	+4.16	+ 0.5	−26 3.0		4 50.0	− 7 58.4	+0.7126	0.6025	+0.1175	+64 − 3
ψ Sagittarii	4.9	4.14	0.7	25 24.2		5 42.1	− 7 8.5	+0.1758	0.6018	0.1201	+34 −33
208 B. Sagittarii	6.1	4.10	0.6	24 19.5		5 43.1	− 7 7.5	−0.8915	0.6018	0.1201	−23 −90
χ Sagittarii	4.9	4.10	1.7	24 40.4		9 21.6	− 3 38.2	−0.0892	0.5986	0.1307	+21 −48
49 Sagittarii	5.5	4.08	1.7	24 7.8		9 27.1	− 3 32.8	−0.6177	0.5985	0.1309	− 6 −88
-1 Sagittarii	5.8	+4.10	+ 2.8	−24 54.3		13 26.1	+ 0 16.3	+0.6967	0.5949	+0.1421	+66 − 4

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
ame.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
gittarii	4.7	+4.10	+ 2.9	−25 4.3	27 13 41.4	+ 0 30.9	+0.8983	0.5947	+0.1428	+65	+ 9
gittarii	6.3	4.04	3.1	23 37.3	14 54.3	+ 1 40.8	−0.3681	0.5935	0.1461	+ 8	−66
gittarii	6.1	4.04	3.1	23 37.4	15 1.0	+ 1 47.3	−0.3491	0.5934	0.1463	+10	−66
gittarii	6.3	4.03	4.4	24 9.1	20 30.1	+ 7 3.1	+1.0203	0.5880	0.1606	+66	+17
gittarii	6.1	3.98	5.2	22 58.2	23 17.9	+ 9 44.2	+0.3007	0.5851	0.1674	+46	−27
gittarii	6.5	+3.97	+ 5.5	−22 50.0	28 0 13.7	+10 37.7	+0.3203	0.5841	+0.1697	+46	−26
pricorni	5.7	3.91	6.8	22 4.3	5 56.6	− 7 52.7	+0.5675	0.5781	0.1824	+62	−12
pricorni	5.3	3.73	8.3	18 26.2	15 2.1	+ 0 52.1	−1.3381	0.5684	0.2013	−57	−72
pricorni	6.4	3.70	9.1	18 20.8	18 56.6	+ 4 37.9	−0.6289	0.5642	0.2084	+ 2	−87
pricorni	5.7	3.67	9.6	18 14.6	21 16.1	+ 6 52.4	−0.2455	0.5617	0.2124	+22	−57
pricorni	6.2	+3.69	+10.2	−19 21.8	23 18.9	+ 8 50.7	+1.3256	0.5595	+0.2158	+71	+46
pricorni	6.5	3.64	10.1	17 51.6	23 52.6	+ 9 23.2	−0.0735	0.5589	0.2167	+31	−47
pricorni	4.2	3.62	10.4	17 34.1	29 2 4.7	+11 30.6	+0.1120	0.5566	0.2202	+41	−37
pricorni	6.1	3.58	11.3	17 41.6	6 5.9	− 8 36.7	+1.1379	0.5524	0.2260	+72	+23
RANUS	6.0	. . .	. . .	16 59.3	6 21.6	− 8 21.6	+0.4796	0.5533	0.2268	+63	−18
pricorni	5.5	+3.53	+10.8	−15 31.3	6 24.1	− 8 19.1	−1.0008	0.5521	+0.2264	−18	−90
pricorni	4.3	3.54	11.8	17 11.6	9 16.4	− 5 32.9	+1.3561	0.5492	0.2303	+70	+50
pricorni	5.1	3.39	12.5	14 25.4	18 3.9	+ 2 56.7	+0.6047	0.5405	0.2407	+72	−11
pricorni	6.0	3.39	12.8	14 47.1	18 45.6	+ 3 37.0	+1.1432	0.5399	0.2414	+75	+22
pricorni	6.1	3.32	13.0	13 7.0	21 50.6	+ 6 35.9	+0.1813	0.5370	0.2445	+49	−34
quarii	6.0	+3.12	+13.9	− 9 27.6	30 10 49.5	− 4 50.4	−0.3458	0.5260	+0.2546	+23	−63
quarii	5.3	3.09	13.8	8 14.7	12 26.9	− 3 16.2	−1.1926	0.5247	0.2555	−26	−90
quarii	6.1	3.03	14.0	6 59.1	17 54.6	+ 2 1.3	−1.1011	0.5207	0.2584	−19	−90
quarii	6.3	3.01	14.9	8 20.1	21 25.1	+ 5 25.3	+1.2148	0.5183	0.2598	+82	+27
quarii	6.4	+2.97	+14.9	− 7 24.2	23 52.1	+ 7 47.9	+0.8817	0.5167	+0.2607	+83	+ 3

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quarii	5.8	+2.88	+15.0	− 5 26.2	1 5 55.5	−10 19.6	+0.4081	0.5130	+0.2622	+66	−22
quarii	6.3	2.87	15.0	5 15.6	7 0.2	− 9 16.9	+0.5061	0.5124	0.2624	+73	−17
quarii	6.1	+2.85	+15.2	− 5 9.9	9 10.5	− 7 10.5	+0.9764	0.5112	+0.2628	+85	+ 9
iscium	6.4	2.68	14.6	0 10.3	20 35.9	+ 3 54.8	−1.2889	0.5059	0.2631	−32	−90
iscium	6.4	2.65	15.4	− 1 33.1	2 1 1.3	+ 8 12.5	+1.3380	0.5042	0.2626	+86	+39
iscium	5.7	2.59	14.6	+ 1 38.1	3 22.2	+10 29.3	−1.4326	0.5034	0.2622	−59	−66
iscium	4.6	2.56	14.8	1 19.0	6 21.9	−10 36.3	−0.3110	0.5025	0.2615	+27	−61
iscium	5.8	+2.50	+14.8	+ 2 27.7	11 37.7	− 5 29.5	−0.1620	0.5012	+0.2601	+35	−52
iscium	6.2	2.51	15.1	1 37.3	12 13.4	− 4 54.8	+0.8905	0.5010	0.2599	+90	+ 3
iscium	5.6	2.28	14.6	6 29.4	3 9 17.1	− 8 26.8	+1.0390	0.4989	0.2494	+90	+14
iscium	6.5	2.24	13.9	8 53.7	14 0.7	− 3 51.2	−0.3940	0.4991	0.2462	+23	−63
iscium	6.3	2.11	13.1	12 30.3	4 3 33.4	+ 9 18.4	−1.0621	0.5007	0.2351	−16	−77
Piscium	3.7	+2.00	+12.6	+14 54.7	16 44.5	− 1 53.3	−0.6842	0.5039	+0.2219	+ 7	−75
Piscium	6.2	1.98	12.8	14 13.9	19 0.2	+ 0 18.5	+0.5613	0.5046	0.2193	+79	− 9
Piscium	6.1	1.97	12.4	15 58.7	21 1.9	+ 2 16.7	−0.9146	0.5052	0.2170	− 7	−74
rietis	6.4	1.94	12.1	16 59.5	5 0 37.9	+ 5 46.4	−1.2549	0.5065	0.2127	−34	−73
rietis	5.8	1.93	12.2	16 32.2	1 28.0	+ 6 35.0	−0.5782	0.5068	0.2117	+13	−69
rietis	5.1	+1.90	+12.0	+17 24.4	6 12.8	+11 11.5	−0.5453	0.5085	+0.2057	+14	−66
rietis	6.4	1.87	11.8	17 50.9	9 29.4	− 9 37.7	−0.3660	0.5098	0.2014	+24	−55
rietis	6.5	1.85	12.0	17 37.7	11 34.5	− 7 36.3	+0.2937	0.5107	0.1986	+61	−20
rietis	6.4	1.85	12.1	16 49.8	12 24.3	− 6 48.0	+1.3394	0.5110	0.1974	+75	+53
rietis	5.9	1.84	11.4	19 6.2	13 1.2	− 6 12.2	−1.0475	0.5113	0.1966	−17	−71
Arietis	5.6	+1.82	+11.4	+19 30.7	16 50.6	− 2 29.6	−0.7582	0.5130	+0.1911	+ 2	−70
Arietis	6.2	1.78	11.4	19 28.9	23 9.9	+ 3 38.2	+0.4530	0.5158	0.1817	+72	−10
Arietis	5.4	1.75	10.7	21 35.8	6 3 14.4	+ 7 35.3	−1.1602	0.5178	0.1752	−28	−68
Arietis	5.7	1.74	11.3	19 39.2	5 1.8	+ 9 19.4	+1.3029	0.5186	0.1724	+79	+52
Arietis (*mean*)	4.6	1.68	10.8	21 0.2	13 20.0	− 6 37.8	+1.1814	0.5228	0.1583	+90	+39
Arietis	5.8	+1.62	+ 9.6	+24 25.6	7 1 26.8	+ 5 6.0	−0.8300	0.5289	+0.1360	− 4	−66

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.						Lim- ing Pa- allels	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.		Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d	h m	h m				°	°
7 Tauri	5.9	+1.59	+ 9.6	+24 11.0	7	6 17.2	+ 9 47.1	+0.0756	0.5313	+0.1264	+48	[illegible]
11 Tauri	6.1	1.58	9.4	25 3.5		9 16.3	−11 19.6	−0.5276	0.5328	0.1204	+14	[illegible]
16 Tauri	5.4	1.56	9.6	24 1.5		11 11.4	− 9 28.3	+0.8459	0.5337	0.1165	+90	[illegible]
17 Tauri	3.8	1.56	9.6	23 51.0		11 13.6	− 9 26.2	+1.0454	0.5337	0.1164	+90	[illegible]
18 Tauri	5.6	1.56	9.4	24 34.6		11 21.0	− 9 18.9	+0.2533	0.5338	0.1161	+59	[illegible]
q Tauri	4.3	+1.56	+ 9.5	+24 12.3		11 22.6	− 9 17.4	+0.6693	0.5338	+0.1161	+90	[illegible]
20 Tauri	4.1	1.56	9.5	24 6.3		11 40.2	− 9 0.4	+0.8127	0.5339	0.1155	+90	[illegible]
21 Tauri	5.8	1.56	9.5	24 17.6		11 42.3	− 8 58.4	+0.6092	0.5339	0.1154	+87	[illegible]
22 Tauri	6.5	1.56	9.5	24 16.0		11 46.3	− 8 54.5	+0.6462	0.5340	0.1153	+90	[illegible]
η Tauri	3.0	1.56	9.6	23 50.7		12 27.3	− 8 14.9	+1.1911	0.5343	0.1139	+90	[illegible]
28 Tauri	5.2	+1.55	+ 9.5	+23 52.8		13 15.2	− 7 28.5	+1.2429	0.5347	+0.1122	+83	[illegible]
14 H. Tauri	5.3	1.56	9.1	25 19.6		13 45.6	− 6 59.0	−0.3058	0.5349	0.1111	+26	[illegible]
p Tauri	5.6	1.52	8.7	26 15.7		23 17.8	+ 2 14.2	−0.3825	0.5393	0.0905	+21	[illegible]
φ Tauri	5.0	1.50	8.3	27 9.0	8	3 40.1	+ 6 27.9	−0.9939	0.5411	0.0808	−17	[illegible]
χ Tauri	5.3	1.49	8.7	25 25.9		4 43.1	+ 7 28.8	+0.9974	0.5415	0.0784	+90	[illegible]
17 B. Aurigæ	6.0	+1.46	+ 7.7	+27 45.5		18 24.4	− 3 17.8	−0.7284	0.5463	+0.0463	+ 1	[illegible]
38 B. Aurigæ	6.5	1.44	7.5	27 34.8		23 44.5	+ 1 51.4	−0.3178	0.5478	0.0334	+25	[illegible]
47 B. Aurigæ	6.0	1.43	7.3	27 55.6	9	2 1.8	+ 4 3.9	−0.6311	0.5484	0.0278	+ 7	[illegible]
354 B. Tauri	6.4	1.42	7.1	27 52.4		7 3.8	+ 8 55.5	−0.4639	0.5494	0.0154	+17	[illegible]
β Tauri	1.8	1.42	6.8	28 32.3		9 25.0	+11 11.8	−1.1698	0.5498	+0.0096	−35	[illegible]
107 B. Aurigæ	6.5	+1.40	+ 6.8	+27 36.6		13 43.9	− 8 38.2	−0.1229	0.5504	−0.0011	+36	[illegible]
112 B. Aurigæ	5.7	1.39	+ 6.9	26 52.4		14 17.2	− 8 6.2	+0.6898	0.5505	0.0025	+90	[illegible]
				NEW	*MOON.*							
π Cancri	5.6	+1.41	− 1.7	+15 17.7	13	19 4.7	− 6 40.8	+1.3093	0.5235	−0.2150	+83	+45
227 B. Cancri	6.4	+1.43	− 1.8	+15 43.9		22 3.2	− 3 47.8	+0.1922	0.5224	−0.2190	+34	[illegible]
7 Leonis	6.2	1.45	2.7	14 45.5	14	5 20.8	+ 3 16.3	−0.3946	0.5197	0.2283	+23	[illegible]
11 Leonis	6.5	1.46	2.8	14 43.9		6 25.1	+ 4 18.7	−0.6105	0.5194	0.2295	+11	[illegible]
ψ Leonis	5.6	1.47	3.1	14 24.6		9 17.1	+ 7 5.4	−0.9283	0.5184	0.2328	− 7	[illegible]
18 Leonis	5.8	1.45	3.7	12 12.1		10 38.6	+ 8 24.4	+1.1182	0.5180	0.2344	+90	+23
19 Leonis	6.4	+1.45	− 3.7	+11 57.6		11 10.3	+ 8 55.1	+1.2508	0.5179	−0.2349	+90	+35
R Leonis (*var.*)	5–10	1.45	3.8	11 49.4		11 14.1	+ 8 58.8	+1.3838	0.5178	0.2350	+72	+55
ν Leonis	5.0	1.49	4.0	12 51.0		16 36.8	− 9 48.3	−0.9931	0.5163	0.2406	−10	−77
A Leonis	4.6	1.49	5.0	10 24.8		21 33.2	− 5 0.8	+0.4052	0.5150	0.2453	+67	−20
44 Leonis	5.9	1.54	6.0	9 12.9	15	6 24.8	+ 3 35.0	−0.5280	0.5132	0.2526	+16	−72
48 Leonis	5.2	+1.55	− 6.8	+ 7 23.4		11 19.4	+ 8 20.8	+0.1602	0.5125	−0.2561	+52	−34
35 Sextantis	6.1	1.56	7.8	5 11.5		15 43.2	−11 23.3	+1.3541	0.5120	0.2588	+83	−42
37 Sextantis	6.3	1.59	7.5	6 49.2		17 7.3	−10 1.7	−0.7308	0.5119	0.2596	+ 5	−83
d Leonis	5.0	1.62	8.8	4 4.3	16	0 34.2	− 2 48.1	+0.2235	0.5117	0.2632	+56	[illegible]
*p*⁴ Leonis	5.7	1.62	9.6	2 24.9		3 51.3	+ 0 23.1	+1.1014	0.5117	0.2644	+90	−17
75 Leonis	5.4	+1.68	−10.0	+ 2 28.5		9 9.8	+ 5 32.2	−0.3715	0.5121	−0.2660	+24	−64
76 Leonis	6.0	1.68	10.1	2 6.8		10 0.2	+ 6 21.0	−0.2151	0.5121	0.2663	+32	−55
359 B. Leonis	6.3	1.69	10.7	0 35.8		12 15.1	+ 8 31.9	+0.7784	0.5124	0.2667	+90	[illegible]
79 Leonis	5.5	1.70	10.4	+ 1 52.3		12 37.6	+ 8 53.7	−0.6597	0.5124	0.2668	+ 9	−80
υ Leonis	4.5	1.74	11.5	− 0 21.5		19 13.3	− 8 42.3	−0.0867	0.5136	0.2675	+39	−45
431 B. Leonis	6.2	+1.73	−12.1	− 1 58.2		19 57.9	− 7 59.1	+1.3998	0.5137	−0.2677	+77	+45
78 B. Virginis	6.5	1.90	14.3	5 15.0	17	14 1.5	+ 9 31.7	−0.0100	0.5192	0.2653	+42	−44
q Virginis	5.3	1.99	16.1	8 59.3		23 38.4	− 5 9.3	+1.3241	0.5237	0.2613	+81	+38
χ Virginis	4.8	2.03	15.7	7 31.9	18	2 18.3	− 2 34.5	−0.8739	0.5251	0.2598	− 4	−90
370 B. Virginis	6.0	2.11	17.2	11 11.6		9 33.3	+ 4 26.7	+1.0317	0.5294	0.2550	+79	+13
ψ Virginis	5.0	+2.12	−16.5	− 9 4.9		9 34.5	+ 4 27.8	−1.1456	0.5294	−0.2550	−23	−90
75 Virginis	5.6	2.37	18.8	14 55.9	19	3 31.0	− 2 11.2	+0.4237	0.5422	0.2375	+61	−21
83 Virginis	5.6	2.45	19.1	15 45.4		8 45.6	− 2 52.7	+0.0375	0.5465	0.2308	+39	−42
85 Virginis	6.1	2.46	19.0	15 20.8		9 15.1	+ 3 21.2	−0.4949	0.5469	0.2302	+12	−74
43 H. Virginis	5.5	2.68	19.5	17 48.6		22 17.8	− 8 3.7	−0.8643	0.5583	0.2101	−11	−90
231 G. Virginis	6.4	+2.70	−19.5	−18 11.8		23 0.2	− 7 22.8	−0.6207	0.5590	−0.2089	[illegible]	−80

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
irginis	5.7	+2.71	-19.6	-18 19.7	19 23 40.7	- 6 43.8	-0.6276	0.5596	-0.2077	+ 2	-87
ibræ	6.5	2.85	19.8	20 4.3	20 6 30.4	- 0 9.0	-0.2368	0.5659	0.1949	+20	-57
ibræ	6.4	2.94	19.8	20 49.3	11 12.0	+ 4 22.0	-0.3725	0.5703	0.1854	+13	-66
ibræ	6.1	2.95	19.8	20 58.5	11 37.6	+ 4 46.7	-0.2973	0.5707	0.1845	+16	-61
ibræ	5.7	3.07	20.4	21 2.3	15 45.7	+ 8 45.3	-0.9755	0.5745	0.1754	-22	-90
ibræ	6.1	+3.10	-19.4	-21 42.4	19 24.9	-11 43.9	-0.9277	0.5779	-0.1670	-20	-90
ibræ	5.8	3.18	19.0	22 5.4	23 22.2	- 7 55.9	-1.1826	0.5815	0.1575	-41	-90
ibræ	6.3	3.34	18.9	24 12.4	21 5 55.1	- 1 38.6	-0.0348	0.5873	0.1407	+25	-45
ibræ	5.0	3.38	18.3	23 32.9	8 41.1	+ 1 0.7	-1.0738	0.5896	0.1333	-34	-90
corpii	4.7	3.49	18.3	25 29.9	12 45.7	+ 4 55.4	+0.3601	0.5929	0.1219	+44	-23
corpii	4.6	+3.50	-18.0	-25 4.7	13 46.1	+ 5 53.3	-0.1814	0.5937	-0.1190	+15	-54
corpii	5.4	3.49	17.7	24 17.1	13 53.2	+ 6 0.1	-0.9892	0.5938	0.1187	-29	-90
corpii	5.9	3.51	17.9	24 59.8	14 10.0	+ 6 16.2	-0.3102	0.5940	0.1179	+ 9	-63
corpii	5.7	3.53	18.2	26 1.3	14 28.5	+ 6 34.0	+0.6776	0.5942	0.1170	+63	- 5
corpii	5.4	3.53	17.5	24 35.5	15 39.6	+ 7 42.2	-0.8885	0.5951	0.1136	-23	-90
corpii	3.0	+3.56	-17.9	-25 52.5	15 44.8	+ 7 47.1	+0.3852	0.5952	-0.1133	+45	-22
corpii	4.9	3.58	17.5	25 38.0	17 26.9	+ 9 25.0	-0.0447	0.5964	0.1083	+22	-46
corpii	6.4	3.57	17.2	24 29.8	17 40.5	+ 9 38.0	-1.2051	0.5966	0.1077	-48	-88
corpii	5.5	3.64	17.3	26 6.3	19 14.0	+11 7.8	+0.2364	0.5977	0.1030	+36	-30
corpii	6.0	3.66	16.6	25 16.0	21 46.8	-10 25.9	-0.8527	0.5995	0.0953	-23	-90
corpii	3.1	+3.71	-16.2	-25 23.7	22 0 7.4	- 8 11.2	-0.9396	0.6010	-0.0881	-29	-90
corpii	1.2	3.78	15.9	26 14.9	3 9.4	- 5 16.9	-0.3395	0.6028	0.0786	+ 3	-65
corpii	6.2	3.80	15.7	26 21.5	3 53.1	- 4 35.0	-0.2871	0.6032	0.0763	+ 6	-61
corpii	2.9	3.87	15.9	28 2.7	5 31.0	- 3 1.3	+1.2744	0.6041	0.0711	+62	+55
corpii	6.4	3.91	15.0	27 18.1	8 36.8	- 0 3.4	+0.3287	0.6056	0.0611	+37	-25
phiuchi	6.2	+4.02	-12.8	-26 24.2	16 51.3	+ 7 49.9	-0.9573	0.6089	-0.0338	-35	-90
phiuchi	6.1	4.09	12.6	27 39.7	18 50.4	+ 9 43.8	+0.2349	0.6094	0.0271	+29	-30
phi. (*1st star*)	5.4	4.05	12.7	26 29.0	19 56.1	+10 46.7	-0.9653	0.6097	0.0234	-36	-90
phiuchi	5.4	4.17	11.7	28 3.9	22 47.4	-10 29.5	+0.5555	0.6102	-0.0137	+48	-12
phiuchi	6.3	4.26	9.7	27 50.8	23 5 59.1	- 3 36.5	+0.3284	0.6109	+0.0109	+33	-25
agittarii (*var.*)	4.4	+4.28	- 9.2	-27 48.1	7 31.5	- 2 8.2	+0.3047	0.6108	+0.0161	+32	-26
agittarii	6.2	4.26	9.0	26 56.9	7 51.8	- 1 48.7	-0.5383	0.6108	0.0173	-12	-81
agittarii	5.7	4.34	8.3	28 3.3	10 49.1	+ 1 0.9	+0.6274	0.6106	0.0274	+54	- 7
agittarii	4.7	4.40	7.2	28 28.2	14 55.8	+ 4 56.9	+1.1810	0.6100	0.0413	+62	+36
agittarii	6.3	4.43	6.3	28 19.1	18 18.3	+ 8 10.6	+1.1896	0.6091	0.0526	+62	+37
agittarii	4.7	+4.38	- 5.9	-27 4.5	18 34.1	+ 8 25.8	-0.0319	0.6091	+0.0535	+17	-45
agittarii	6.2	4.41	4.8	26 41.2	22 5.8	+11 48.3	-0.2085	0.6080	0.0652	+ 9	-56
agittarii	6.3	4.41	4.8	26 48.6	22 13.9	+11 56.1	-0.0774	0.6079	0.0656	+16	-48
agittarii	6.5	4.40	4.7	26 38.3	22 32.6	-11 46.0	-0.2280	0.6078	0.0667	+ 8	-57
agittarii	3.3	4.48	2.9	27 4.8	24 4 39.6	- 5 54.6	+0.6803	0.6051	0.0865	+61	- 5
agittarii	2.1	+4.47	- 1.7	-26 24.2	8 13.4	- 2 29.9	+0.3360	0.6032	+0.0977	+41	-24
agittarii	6.4	4.42	1.2	24 59.5	9 23.2	- 1 23.1	-0.9543	0.6026	0.1013	-29	-90
agittarii	6.4	4.43	0.9	25 3.7	10 9.3	- 0 38.9	-0.8060	0.6021	0.1037	-19	-90
agittarii	5.8	4.43	0.8	24 57.9	10 55.4	+ 0 5.3	-0.8214	0.6016	0.1060	-20	-90
agittarii	6.1	4.44	- 0.1	24 47.5	13 5.1	+ 2 9.5	-0.7589	0.6003	0.1126	-16	-90
agittarii	5.9	+4.49	+ 0.3	-26 3.0	14 56.4	+ 3 56.2	+0.7096	0.5990	+0.1181	+64	- 3
agittarii	4.9	4.47	0.7	25 24.2	15 49.1	+ 4 46.7	+0.1706	0.5985	0.1207	+33	-34
agittarii	6.1	4.44	0.8	24 19.5	15 50.1	+ 4 47.6	-0.9029	0.5985	0.1207	-24	-90
agittarii	4.9	4.46	1.8	24 40.4	19 30.9	+ 8 19.3	-0.0910	0.5958	0.1314	+21	-49
agittarii	5.5	4.44	1.9	24 7.7	19 36.6	+ 8 24.8	-0.6221	0.5957	0.1317	- 6	-89
agittarii	5.8	+4.48	+ 3.0	-24 54.3	23 37.7	-11 43.9	+0.7040	0.5926	+0.1428	+65	- 4
agittarii	4.7	4.49	3.1	25 4.3	23 53.1	-11 29.2	+0.9066	0.5924	0.1435	+65	+ 9
agittarii	6.3	4.43	3.5	23 37.3	25 1 6.6	-10 18.7	-0.3636	0.5915	0.1469	+ 9	-66
agittarii	6.1	4.44	3.6	23 37.4	1 13.4	-10 12.2	-0.3444	0.5914	0.1472	+10	-65
agittarii	6.3	4.46	4.9	24 9.1	6 44.6	- 4 54.3	+1.0369	0.5867	0.1615	+66	+18
agittarii	6.1	+4.42	+ 6.0	-22 58.2	9 33.2	- 2 12.3	+0.3186	0.5843	+0.1685	+46	-26

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
336 B. Sagittarii	6.5	+4.41	+ 6.2	−22 50.0	**25** 10 29.2	− 1 18.6	+0.3395	0.5834	+0.1707	+48	−25
4 Capricorni	5.7	4.39	7.8	22 4.3	16 13.0	+ 4 11.9	+0.5941	0.5782	0.1840	+63	−11
υ Capricorni	5.3	4.25	10.1	18 26.1	**26** 1 18.3	−11 3.6	−1.3003	0.5696	0.2030	−49	−81
81 B. Capricorni	6.4	4.24	11.0	18 20.8	5 12.1	− 7 18.5	−0.5858	0.5659	0.2102	+ 4	−82
19 Capricorni	5.7	4.22	11.6	18 14.6	7 31.1	− 5 4.6	−0.1997	0.5636	0.2144	+24	−55
21 Capricorni	6.5	+4.21	+12.2	−17 51.6	10 6.8	− 2 34.5	−0.0248	0.5612	+0.2187	+34	−45
θ Capricorni	4.2	4.19	12.6	17 34.1	12 18.1	− 0 27.9	+0.1631	0.5591	0.2223	+44	−35
Uranus	6.0	. . .	. . .	17 16.4	14 54.0	+ 2 2.4	+0.4480	0.5583	0.2268	+60	−20
114 B. Capricorni	6.1	4.17	13.6	17 41.6	16 17.6	+ 3 23.1	+1.1909	0.5555	0.2283	+72	+28
29 Capricorni	5.5	4.11	13.4	15 31.3	16 35.6	+ 3 40.4	−0.9415	0.5551	0.2288	−14	−90
42 Capricorni	5.1	+4.02	+15.5	−14 25.4	**27** 4 8.5	− 9 10.6	+0.6723	0.5446	+0.2436	+75	− 8
44 Capricorni	6.0	4.03	15.8	14 47.1	4 49.7	− 8 30.8	+1.2087	0.5440	0.2443	+75	+28
151 B. Capricorni	6.1	3.97	16.2	13 6.9	7 52.4	− 5 34.3	+0.2546	0.5414	0.2475	+53	−30
150 B. Aquarii	6.0	3.80	17.8	9 27.5	20 40.0	+ 6 48.1	−0.2561	0.5313	0.2580	+28	−58
ρ Aquarii	5.3	3.77	17.9	8 14.6	22 15.7	+ 8 20.8	−1.0955	0.5301	0.2590	−19	−90
170 B. Aquarii	6.0	+3.75	+18.0	− 7 37.2	23 52.4	+ 9 54.4	−1.3220	0.5290	+0.2600	−39	−87
186 B. Aquarii	6.1	3.72	18.3	6 59.1	**28** 3 37.9	−10 27.3	−0.9991	0.5264	0.2620	−12	−90
167 G. Aquarii	6.3	3.72	19.1	8 20.0	7 4.6	− 7 7.1	+1.3025	0.5241	0.2635	+82	+35
67 Aquarii	6.4	3.68	19.3	7 24.2	9 28.9	− 4 47.3	+0.9740	0.5226	0.2644	+83	+ 9
252 B. Aquarii	5.8	3.61	19.6	5 26.1	15 25.3	+ 0 58.1	+0.5085	0.5191	0.2660	+73	−17
197 G. Aquarii	6.3	+3.60	+19.7	− 5 15.5	16 28.7	+ 1 59.6	+0.6065	0.5185	+0.2662	+80	−12
263 B. Aquarii	6.1	3.58	19.9	5 9.8	18 36.3	+ 4 3.3	+1.0744	0.5174	0.2666	+85	+15
22 B. Piscium	6.4	3.43	19.9	− 0 10.2	**29** 5 47.6	− 9 5.5	−1.1642	0.5122	0.2669	−21	−90
16 Piscium	5.7	3.37	19.9	+ 1 38.2	12 25.3	− 2 39.7	−1.3027	0.5098	0.2659	−34	−88
λ Piscium	4.6	3.35	20.1	1 19.1	15 21.1	+ 0 10.9	−0.1901	0.5088	0.2652	+33	−54
19 Piscium	5.4	+3.32	+19.9	+ 3 1.2	17 36.3	+ 2 22.2	−1.3940	0.5082	+0.2645	−47	−75
22 Piscium	5.8	3.31	20.2	2 27.8	20 30.2	+ 5 11.0	−0.0402	0.5074	0.2636	+41	−45
25 Piscium	6.2	3.31	20.5	1 37.4	21 5.0	+ 5 44.8	+1.0027	0.5073	0.2634	+90	+10
51 Piscium	5.6	3.12	20.2	6 29.5	**30** 17 42.3	+ 1 46.1	+1.1551	0.5045	0.2523	+90	+22
136 B. Piscium	6.5	3.07	19.5	8 53.8	22 20.3	+ 6 16.1	−0.2649	0.5044	0.2489	+30	−56
75 Piscium	6.3	+2.97	+18.7	+12 30.4	**31** 11 37.8	− 4 49.4	−0.9282	0.5054	+0.2372	− 7	−77

AUGUST.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
η Piscium	3.7	+2.88	+17.9	+14 54.8	**1** 0 35.8	+ 7 45.8	−0.5562	0.5078	+0.2234	+14	−70
101 Piscium	6.2	+2.87	+18.1	+14 13.9	2 49.4	+ 9 55.5	+0.6796	0.5083	+0.2207	+90	− 3
105 Piscium	6.1	2.86	17.5	15 58.8	4 49.4	+11 52.0	−0.7862	0.5088	0.2183	+ 1	−74
3 Arietis	6.4	2.83	17.1	16 59.5	8 22.3	− 8 41.4	−1.1254	0.5098	0.2139	−22	−73
4 Arietis	5.8	2.83	17.2	16 32.3	9 11.6	− 7 53.6	−0.4536	0.5100	0.2128	+19	−62
ι Arietis	5.1	2.80	16.9	17 24.5	13 52.7	− 3 20.9	−0.4229	0.5114	0.2066	+21	−59
35 B. Arietis	6.4	+2.77	+16.6	+17 51.0	17 6.9	− 0 12.5	−0.2459	0.5125	+0.2022	+30	−48
47 B. Arietis	6.5	2.76	16.7	17 37.8	19 10.4	+ 1 47.3	+0.4089	0.5132	0.1992	+68	−14
15 Arietis	5.9	2.76	16.1	19 6.3	20 36.2	+ 3 10.5	−0.9248	0.5138	0.1972	− 8	−71
θ Arietis	5.6	2.73	15.9	19 30.8	**2** 0 23.1	+ 6 50.6	−0.6391	0.5151	0.1916	+ 9	−69
26 Arietis	6.2	2.69	15.7	19 29.0	6 38.6	−11 5.4	+0.5627	0.5176	0.1819	+81	− 4
ν Arietis	5.4	+2.67	+14.8	+21 35.9	10 41.0	− 7 10.4	−1.0444	0.5193	+0.1753	−18	−65
ε Arietis (*mean*)	4.6	2.59	14.6	21 0.3	20 42.1	+ 2 31.9	+1.2813	0.5236	0.1581	+81	+50
64 Arietis	5.8	2.54	12.7	24 25.6	**3** 8 44.9	− 9 48.2	−0.7290	0.5290	0.1355	+ 2	−66
7 Tauri	5.9	2.50	12.6	24 11.0	13 34.3	− 5 8.1	+0.1706	0.5311	0.1259	+53	−18
11 Tauri	6.1	2.49	12.1	25 3.5	16 32.8	− 2 15.4	−0.4326	0.5324	0.1198	+19	−40
16 Tauri	5.4	+2.46	+12.3	+24 1.6	18 27.5	− 0 24.5	+0.9357	0.5333	+0.1158	+90	+25
17 Tauri	3.8	2.46	12.3	23 51.0	18 29.7	− 0 22.4	+1.1347	0.5333	0.1158	+90	+40
18 Tauri	5.6	2.46	12.1	24 34.6	18 37.1	− 0 15.1	+0.3447	0.5333	0.1155	+65	− 8
q Tauri	4.3	2.46	12.2	24 12.3	18 38.7	− 0 13.6	+0.7595	0.5333	0.1154	+90	+15
20 Tauri	4.1	2.46	12.2	24 6.4	18 56.3	+ 0 3.4	+0.9023	0.5335	0.1148	+90	+27
21 Tauri	5.8	+2.46	+12.2	+24 17.6	18 58.4	+ 0 5.4	+0.6993	0.5335	+0.1147	+90	+10

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
auri	6.5	+2.46	+12.2	+24 16.0	3 19 2.3	+ 0 9.2	+0.7362	0.5335	+0.1146	+90	+13
auri	3.0	2.45	12.3	23 50.8	19 43.2	+ 0 48.7	+1.2792	0.5338	0.1132	+75	+56
auri	5.3	2.46	11.6	25 19.6	21 1.3	+ 2 4.3	−0.2143	0.5344	0.1105	+31	−36
auri	5.6	2.40	10.7	26 15.8	4 6 32.5	+11 16.6	−0.2968	0.5383	0.0898	+26	−39
auri	5.0	2.38	10.0	27 9.1	10 54.5	− 8 30.2	−0.9098	0.5400	0.0800	−10	−63
auri	5.3	+2.35	+10.6	+25 26.0	11 57.4	− 7 29.3	−1.0763	0.5404	+0.0776	+90	+39
urigæ	6.0	2.29	8.7	27 45.5	5 1 38.5	+ 5 44.0	−0.6547	0.5449	0.0456	+ 6	−58
urigæ	6.5	2.25	8.3	27 34.8	6 58.7	+10 53.1	−0.2485	0.5463	0.0327	+29	−30
urigæ	6.0	2.24	8.0	27 55.6	9 16.1	−10 54.1	−0.5627	0.5469	0.0271	+11	−50
auri	6.4	2.20	7.6	27 52.5	14 18.2	− 6 2.5	−0.3992	0.5480	0.0147	+21	−38
auri	1.8	+2.20	+ 7.0	+28 32.3	16 39.5	− 3 46.1	−1.1054	0.5483	+0.0089	−28	−61
urigæ	6.5	2.16	7.0	27 36.6	20 58.4	+ 0 23.9	−0.0633	0.5490	−0.0018	+40	−18
urigæ	5.7	2.14	7.1	26 52.4	21 31.8	+ 0 56.1	+0.7475	0.5491	0.0032	+90	+24
auri	5.6	2.12	6.3	27 56.7	6 3 39.8	+ 6 51.4	−0.5009	0.5496	0.0185	+15	−45
auri	4.6	2.11	6.3	27 35.7	4 43.2	+ 7 52.6	−0.1354	0.5497	0.0211	+35	−23
auri	6.1	+2.09	+ 5.9	+27 34.2	8 8.2	+11 10.4	−0.1950	0.5499	−0.0296	+32	−27
eminorum	5.7	1.92	3.9	25 29.0	7 8 24.6	+10 36.5	+0.6501	0.5480	0.0890	+90	+11
eminorum	6.2	1.91	3.7	26 11.7	9 58.0	−11 53.4	−0.2695	0.5477	0.0927	+28	−37
eminorum	6.3	1.92	3.6	26 1.9	10 15.9	−11 36.1	−0.1186	0.5477	0.0934	+37	−29
eminorum	5.8	1.86	3.3	24 16.4	16 8.9	− 5 55.1	+1.2138	0.5464	0.1071	+87	+48
eminorum	6.1	+1.87	+ 3.0	+25 2.1	17 9.2	− 4 56.9	+0.2725	0.5462	−0.1094	+60	−10
eminorum	5.1	1.85	2.6	25 12.9	21 8.1	− 1 6.1	−0.3789	0.5452	0.1185	+22	−46
eminorum	6.3	1.82	2.0	24 33.1	8 3 52.7	+ 5 24.8	−0.5044	0.5433	0.1334	+15	−55
eminorum	6.0	1.81	2.0	24 25.0	4 19.2	+ 5 50.3	−0.4160	0.5431	0.1344	+20	−50
eminorum	6.3	1.79	+ 2.1	23 13.0	5 9.3	+ 6 38.7	+0.7762	0.5428	0.1361	+90	+13
				NEW	*MOON.*						
eonis	5.0	+1.55	− 7.9	+ 4 4.3	12 6 32.3	+ 4 57.5	+0.1932	0.5163	−0.2659	+54	−33
eonis	5.7	1.53	8.5	2 24.9	9 46.6	+ 8 5.9	+1.0656	0.5163	0.2671	+90	+14
eonis	5.4	1.58	9.0	2 28.5	15 0.7	−10 49.4	−0.4013	0.5165	0.2687	+23	−66
eonis	6.0	+1.57	− 9.1	+ 2 6.8	15 50.4	−10 1.3	−0.2460	0.5166	−0.2689	+31	−57
eonis	6.3	1.57	9.5	0 35.8	18 3.6	− 7 52.1	+0.7423	0.5168	0.2693	+90	− 5
eonis	5.5	1.59	9.3	+ 1 52.3	18 25.7	− 7 30.7	−0.6891	0.5168	0.2693	+ 8	−90
eonis	4.5	1.60	10.2	− 0 21.4	13 0 56.5	− 1 11.7	−0.1203	0.5176	0.2700	+37	−50
eonis	6.2	1.59	10.6	1 58.1	1 40.5	− 0 29.1	+1.3598	0.5178	0.2700	+83	+41
irginis	6.5	+1.69	−12.6	− 5 15.0	19 33.0	− 7 9.5	−0.0470	0.5223	−0.2670	+40	−46
irginis	5.3	1.75	14.2	8 59.2	14 5 5.8	+ 2 5.4	+1.2848	0.5260	0.2626	+81	+33
irginis	4.8	1.79	13.9	7 31.9	7 44.9	+ 4 39.5	−0.9110	0.5272	0.2609	− 6	−90
irginis	6.0	1.84	15.3	11 11.5	14 58.2	+11 38.9	+0.9939	0.5308	0.2557	+79	+11
irginis	5.0	1.86	14.7	9 4.9	14 59.5	+11 40.2	−1.1838	0.5308	0.2557	−26	−90
irginis	5.6	+2.06	−17.0	−14 55.8	15 8 56.1	+ 5 1.3	+0.3879	0.5418	−0.2373	+59	−23
irginis	5.6	2.14	17.3	15 45.4	14 12.1	+10 6.6	+0.0013	0.5454	0.2304	+37	−43
irginis	6.1	2.14	17.2	15 20.7	14 41.8	+10 35.3	−0.5331	0.5458	0.2297	+10	−77
irginis	5.5	2.35	17.9	17 48.6	16 3 50.7	− 0 43.5	−0.9037	0.5557	0.2090	−14	−90
irginis	6.4	2.36	18.0	18 11.7	4 33.5	− 0 2.2	−0.6588	0.5562	0.2077	0	−90
irginis	5.7	+2.37	−18.1	−18 19.7	5 14.4	+ 0 37.3	−0.6656	0.5568	−0.2065	0	−90
ibræ	6.5	2.50	18.4	20 4.3	12 9.0	+ 7 16.9	−0.2715	0.5622	0.1935	+19	−59
ibræ	6.4	2.58	18.6	20 49.3	16 54.6	+11 52.0	−0.4075	0.5661	0.1838	+11	−69
ibræ	6.1	2.60	18.5	20 58.4	17 20.6	−11 42.9	−0.3316	0.5664	0.1829	+15	−63
ibræ	5.7	2.72	19.4	21 2.3	21 32.6	− 7 40.4	−1.0147	0.5697	0.1738	−25	−90
ibræ	6.1	+2.76	−18.3	−21 42.4	17 1 15.7	− 4 5.7	−0.9663	0.5727	−0.1653	−23	−90
ibræ	5.8	2.83	18.1	22 5.4	5 17.4	− 0 13.2	−1.2232	0.5758	0.1558	−45	−88
ibræ	6.3	2.99	18.2	24 12.4	11 58.3	+ 6 12.1	−0.0632	0.5808	0.1390	+23	−47
ibræ	5.0	3.04	17.6	23 32.8	14 47.9	+ 8 55.0	−1.1126	0.5828	0.1315	−37	−90
corpii	4.7	3.15	17.8	25 29.9	18 57.9	−11 4.9	+0.3376	0.5856	0.1202	+43	−25
corpii	4.6	+3.17	−17.5	−25 4.7	19 59.8	−10 5.5	−0.2097	0.5864	−0.1174	+14	−56

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
31 B. Scorpii	5.4	+3.16	−17.2	−24 17.1	17 20 7.1	− 9 58.5	−1.0265	0.5864	−0.1170	−32	−90
3 Scorpii	5.9	3.17	17.4	24 59.8	20 24.3	− 9 41.9	−0.3398	0.5866	0.1162	+ 7	−65
4 Scorpii	5.7	3.20	17.8	26 1.3	20 43.2	− 9 23.8	+0.6591	0.5868	0.1153	+61	− 6
40 B. Scorpii	5.4	3.20	17.1	24 35.5	21 56.0	− 8 13.9	−0.9244	0.5876	0.1119	−26	−90
π Scorpii	3.0	3.22	17.6	25 52.5	22 1.3	− 8 8.9	+0.3638	0.5877	0.1117	+43	−23
48 B. Scorpii	4.9	+3.25	−17.2	−25 38.0	23 45.8	− 6 28.6	−0.0705	0.5888	−0.1067	+20	−48
50 B. Scorpii	6.4	3.24	16.8	24 29.8	23 59.8	− 6 15.2	−1.2443	0.5889	0.1061	−53	−81
65 B. Scorpii	5.5	3.31	17.1	26 6.2	18 1 35.7	− 4 43.1	+0.2142	0.5899	0.1015	+34	−31
85 B. Scorpii	6.0	3.34	16.4	25 16.0	4 12.3	− 2 12.9	−0.8872	0.5914	0.0938	−25	−90
σ Scorpii	3.1	3.39	16.0	25 23.7	6 36.5	+ 0 5.4	−0.9747	0.5927	0.0867	−32	−90
α Scorpii	1.2	+3.47	−15.8	−26 14.9	9 43.3	+ 3 4.5	−0.3668	0.5943	−0.0773	+ 2	−67
116 B. Scorpii	6.2	3.49	15.7	26 21.5	10 28.1	+ 3 47.5	−0.3135	0.5946	0.0750	+ 5	−63
τ Scorpii	2.9	3.56	16.0	28 2.7	12 8.8	+ 5 24.1	+1.2683	0.5954	0.0698	+62	+52
134 B. Scorpii	6.4	3.61	15.1	27 18.1	15 19.6	+ 8 26.9	+0.3112	0.5968	0.0599	+36	−26
118 B. Ophiuchi	6.2	3.76	13.1	26 24.2	23 48.1	− 7 25.8	−0.9898	0.5995	0.0330	−37	−90
95 G. Ophiuchi	6.1	+3.83	−13.1	−27 39.7	19 1 50.7	− 5 28.3	+0.2187	0.6000	−0.0264	+29	−31
36 Ophi. (*1st star*)	5.4	3.80	13.1	26 29.0	2 58.3	− 4 23.5	−0.9973	0.6002	0.0228	−39	−90
43 Ophiuchi	5.4	3.92	12.3	28 3.9	5 54.6	− 1 34.6	+0.5446	0.6007	0.0133	+47	−12
163 G. Ophiuchi	6.3	4.05	10.4	27 50.8	13 19.2	+ 5 31.3	+0.3162	0.6012	−0.0109	+33	−25
X Sagittarii (*var.*)	4.4	4.08	10.0	27 48.1	14 54.3	+ 7 2.3	+0.2925	0.6012	+0.0161	+31	−27
4 G. Sagittarii	6.2	+4.06	− 9.6	−26 56.9	15 15.2	+ 7 22.4	−0.5620	0.6011	+0.0172	−13	−63
10 G. Sagittarii	5.7	4.15	9.1	28 3.3	18 17.8	+10 17.3	+0.6202	0.6009	0.0272	+54	− 8
38 B. Sagittarii	4.7	4.23	8.2	28 28.2	22 31.9	− 9 39.3	+1.1823	0.6003	0.0408	+62	−36
48 G. Sagittarii	6.3	4.28	7.3	28 19.1	20 2 0.4	− 6 19.6	+1.1917	0.5995	0.0520	+62	−37
66 B. Sagittarii	4.7	4.24	6.7	27 4.6	2 16.6	− 6 4.0	−0.0464	0.5995	0.0529	+16	−40
68 G. Sagittarii	6.2	+4.28	− 5.6	−26 41.3	5 54.7	− 2 35.0	−0.2246	0.5985	+0.0644	+ 8	−57
69 G. Sagittarii	6.3	4.29	5.6	26 48.6	6 3.0	− 2 27.1	−0.0918	0.5984	0.0648	+15	−40
86 B. Sagittarii	6.5	4.28	5.5	26 38.3	6 22.2	− 2 8.7	−0.2443	0.5983	0.0658	+ 8	−56
φ Sagittarii	3.3	4.39	3.8	27 4.8	12 39.9	+ 3 53.4	+0.6772	0.5959	0.0853	+61	− 5
σ Sagittarii	2.1	4.40	2.6	26 24.2	16 19.8	+ 7 24.3	+0.3290	0.5942	0.0964	+40	−25
162 B. Sagittarii	6.4	+4.36	− 1.9	−24 59.5	17 31.6	+ 8 33.1	−0.9780	0.5936	+0.1000	−31	−90
127 G. Sagittarii	6.4	4.38	1.6	25 3.7	18 19.0	+ 9 18.5	−0.8275	0.5932	0.1023	−21	−90
172 B. Sagittarii	5.8	4.38	1.5	24 57.9	19 6.4	+10 4.0	−0.8430	0.5928	0.1047	−21	−90
189 B. Sagittarii	6.1	4.40	0.7	24 47.5	21 19.7	−11 48.1	−0.7791	0.5916	0.1111	−17	−90
201 B. Sagittarii	5.9	4.47	0.5	26 3.0	23 14.0	− 9 58.5	+0.7083	0.5905	0.1166	+64	− 3
ψ Sagittarii	4.9	+4.45	− 0.1	−25 24.3	21 0 8.1	− 9 6.6	+0.1627	0.5899	+0.1192	+33	−34
208 B. Sagittarii	6.1	4.42	+ 0.1	24 19.5	0 9.2	− 9 5.5	−0.9243	0.5899	0.1192	−25	−90
χ Sagittarii	4.9	4.46	1.2	24 40.5	3 55.9	− 5 28.0	−0.1016	0.5876	0.1297	+20	−40
49 Sagittarii	5.5	4.44	1.3	24 7.8	4 1.6	− 5 22.4	−0.6392	0.5876	0.1300	− 7	−90
51 Sagittarii	5.8	4.50	2.3	24 54.3	8 9.0	− 1 24.9	+0.7035	0.5848	0.1411	+65	− 4
h Sagittarii	4.7	+4.52	+ 2.4	−25 4.3	8 24.8	− 1 9.7	+0.9086	0.5846	+0.1418	+65	− 0
53 Sagittarii	6.3	4.47	3.0	23 37.3	9 40.1	+ 0 2.6	−0.3765	0.5837	0.1451	+ 8	−67
274 B. Sagittarii	6.1	4.47	3.0	23 37.4	9 47.1	+ 0 9.3	−0.3570	0.5836	0.1454	+ 9	−65
308 B. Sagittarii	6.3	4.53	4.3	24 9.1	15 26.3	+ 5 35.3	+1.0407	0.5796	0.1597	+66	−10
329 B. Sagittarii	6.1	4.51	5.6	22 58.2	18 18.9	+ 8 21.2	+0.3147	0.5774	0.1667	+46	−20
336 B. Sagittarii	6.5	+4.51	+ 5.9	−22 50.0	19 16.1	+ 9 16.2	+0.3358	0.5766	+0.1689	+47	−25
4 Capricorni	5.7	4.51	7.5	22 4.3	22 1 7.4	− 9 5.8	+0.5935	0.5720	0.1822	+63	−11
υ Capricorni	5.3	4.42	10.5	18 26.1	10 23.2	− 0 10.7	−1.3175	0.5645	0.2012	−51	−78
81 B. Capricorni	6.4	4.43	11.5	18 20.8	14 21.1	+ 3 38.6	−0.5960	0.5612	0.2086	+ 4	−83
19 Capricorni	5.7	4.44	12.1	18 14.6	16 42.3	+ 5 54.6	−0.2065	0.5593	0.2128	+24	−55
21 Capricorni	6.5	+4.43	+12.8	−17 51.6	19 20.4	+ 8 27.1	−0.0299	0.5571	+0.2173	+34	−45
θ Capricorni	4.2	4.43	13.3	17 34.1	21 33.7	+10 35.7	+0.1595	0.5554	0.2209	+44	−35
URANUS	6.0	. . .	. . .	17 35.0	22 17.8	+11 18.2	+0.3382	0.5564	0.2225	+54	−25
114 B. Capricorni	6.1	4.43	14.2	17 41.6	23 1 36.3	− 9 30.2	+1.1943	0.5520	0.2271	+72	+28
29 Capricorni	5.5	4.37	14.5	15 31.3	1 54.6	− 9 12.6	−0.9525	0.5518	0.2275	−15	−90
42 Capricorni	5.1	+4.34	+16.8	−14 25.3	13 34.8	+ 2 3.6	+0.6709	0.5428	+0.2428	+75	− 8

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	"	° ′	d h m	h m				°	°
Capricorni	6.0	+4.35	+17.1	-14 47.0	23 14 16.3	+ 2 43.7	+1.2101	0.5423	+0.2435	+75	+28
. Capricorni	6.1	4.30	17.8	13 6.9	17 20.4	+ 5 41.7	+0.2513	0.5401	0.2468	+53	-30
. Aquarii	6.0	4.20	20.1	9 27.5	24 6 11.6	- 5 52.3	-0.2616	0.5314	0.2580	+28	-58
Aquarii	5.3	4.18	20.4	8 14.6	7 47.5	- 4 19.4	-1.1030	0.5303	0.2591	-19	-90
. Aquarii	6.0	4.15	20.6	7 37.1	9 24.3	- 2 45.7	-1.3298	0.5294	0.2601	-40	-86
. Aquarii	6.1	+4.14	+21.1	- 6 59.0	13 10.0	+ 0 52.9	-1.0059	0.5272	+0.2623	-12	-90
. Aquarii	6.3	4.16	21.7	8 20.0	16 36.6	+ 4 12.9	+1.2984	0.5252	0.2640	+82	+35
Aquarii	6.4	4.13	22.0	7 24.1	19 0.6	+ 6 32.4	+0.9689	0.5239	0.2650	+83	+ 9
3. Aquarii	5.8	4.08	22.7	5 26.1	25 0 56.0	-11 43.2	+0.5020	0.5213	0.2669	+73	-18
G. Aquarii	6.3	4.08	22.8	5 15.5	1 59.2	-10 42.0	+ .5997	0.5206	0.2672	+79	-12
B. Aquarii	6.1	+4.07	+23.0	- 5 9.7	4 6.3	- 8 38.7	+1.0671	0.5196	+0.2676	+85	+15
B. Piscium	6.4	3.96	23.8	0 10.1	15 13.4	+ 2 8.2	-1.1704	0.5153	0.2683	-22	-90
Piscium	6.4	3.96	24.3	- 1 32.9	19 31.1	+ 6 18.1	+1.4293	0.5139	0.2679	+68	+57
Piscium	5.7	3.91	24.1	+ 1 38.2	21 47.7	+ 8 30.7	-1.3090	0.5132	0.2675	-35	-88
Piscium	4.6	3.91	24.2	1 19.1	26 0 41.8	+11 19.6	-0.1995	0.5125	0.2669	+33	-54
Piscium	5.4	+3.88	+24.3	+ 3 1.3	2 55.6	-10 30.5	-1.4003	0.5120	+0.2664	-48	-76
Piscium	5.8	3.88	24.5	2 27.9	5 47.7	- 7 43.5	-0.0509	0.5114	0.2655	+41	-46
Piscium	6.2	3.89	24.6	1 37.5	6 22.1	- 7 10.2	+0.9884	0.5112	0.2653	+90	+ 9
Piscium	5.6	3.78	24.8	6 29.6	27 2 43.8	-11 24.5	+1.1344	0.5092	0.2544	+90	+21
B. Piscium	6.5	3.75	24.4	8 53.9	7 17.9	- 6 58.4	-0.2798	0.5092	0.2510	+29	-57
Piscium	6.3	+3.70	+23.7	+12 30.4	20 23.9	+ 5 44.6	-0.9426	0.5102	+0.2393	- 8	-77
Piscium	3.7	3.65	22.9	14 54.9	28 9 10.7	- 5 51.5	-0.5755	0.5124	0.2251	+13	-70
Piscium	6.2	3.64	23.0	14 14.0	11 22.4	- 4 43.7	+0.6534	0.5129	0.2225	+88	- 4
Piscium	6.1	3.64	22.5	15 58.9	13 20.7	- 1 49.0	-0.8053	0.5134	0.2200	0	-74
3 Arietis	6.4	3.63	22.1	16 59.6	16 50.7	+ 1 34.8	-1.1436	0.5142	0.2155	-23	-73
4 Arietis	5.8	+3.62	+22.2	+16 32.3	17 39.4	+ 2 22.0	-0.4755	0.5144	+0.2144	+18	-63
1 Arietis	5.1	3.60	21.7	17 24.5	22 16.7	+ 6 50.9	-0.4459	0.5157	0.2081	+20	-60
5 B. Arietis	6.4	3.59	21.4	17 51.1	29 1 28.4	+ 9 56.8	-0.2705	0.5166	0.2035	+29	-50
7 B. Arietis	6.5	3.57	21.4	17 37.9	3 30.4	+11 55.1	+0.3806	0.5172	0.2006	+66	-16
5 Arietis	5.9	3.59	20.9	19 6.3	4 55.1	-10 42.8	-0.9470	0.5177	0.1985	-10	-71
6 Arietis	5.6	+3.56	+20.6	+19 30.9	8 39.2	- 7 5.6	-0.6635	0.5189	+0.1928	+ 8	-70
16 Arietis	6.2	3.54	20.2	19 29.1	14 50.5	- 1 5.7	+0.5316	0.5210	0.1829	+78	- 6
ν Arietis	5.4	3.54	19.2	21 36.0	18 50.3	+ 2 46.7	-1.0693	0.5224	0.1762	-20	-68
ε Arietis (*mean*)	4.6	3.47	18.6	21 0.4	30 4 45.9	-11 36.5	+1.2453	0.5261	0.1586	+86	+45
64 Arietis	5.8	3.45	16.4	24 25.7	16 43.5	- 0 1.9	-0.7599	0.5307	0.1357	0	-66
7 Tauri	5.9	+3.42	+16.0	+24 11.1	21 31.3	+ 4 36.5	+0.1362	0.5325	+0.1260	+51	-20
11 Tauri	6.1	3.41	15.4	25 3.6	31 0 28.9	+ 7 28.5	-0.4657	0.5335	0.1199	+17	-51
16 Tauri	5.4	3.38	15.5	24 1.6	2 23.2	+ 9 19.0	+0.8989	0.5342	0.1159	+90	+22
17 Tauri	3.8	3.38	15.5	23 51.1	2 25.3	+ 9 21.0	+1.0974	0.5342	0.1158	+90	+36
18 Tauri	5.6	3.39	15.3	24 34.7	2 32.7	+ 9 28.2	+0.3093	0.5343	0.1156	+62	-10
q Tauri	4.3	+3.38	+15.4	+24 12.4	2 34.3	+ 9 29.7	+0.7231	0.5343	+0.1155	+90	+12
20 Tauri	4.1	3.38	15.4	24 6.4	2 51.8	+ 9 46.7	+0.8655	0.5344	0.1149	+90	+20
21 Tauri	5.8	3.38	15.3	24 17.7	2 53.9	+ 9 48.7	+0.6631	0.5344	0.1148	+90	+ 9
22 Tauri	6.5	3.38	15.3	24 16.1	2 57.9	+ 9 52.6	+0.6999	0.5344	0.1147	+90	+11
η Tauri	3.0	3.37	15.4	23 50.8	3 38.5	+10 31.8	+1.2415	0.5347	0.1132	+83	+51
28 Tauri	5.2	+3.36	+15.3	+23 52.9	4 26.2	+11 17.9	+1.2925	0.5350	+0.1115	+70	+60
14 H. Tauri	5.3	3.38	14.7	25 19.7	4 56.4	+11 47.1	-0.2486	0.5352	0.1104	+29	-38
p Tauri	5.6	3.33	13.3	26 15.8	14 26.1	- 3 2.0	-0.3322	0.5384	0.0897	+25	-41
φ Tauri	5.0	3.32	12.4	27 9.1	18 47 7	+ 1 10.8	-0.9447	0.5398	0.0708	-13	-63
χ Tauri	5.3	+3.28	+12.9	+25 26.0	19 50 6	+ 2 11.5	+1.0385	0.5401	+0.0774	+90	+36

SEPTEMBER.

17 B. Aurigæ	6.0	+3.22	+10.3	+27 45.5	1 9 32.3	- 8 34.5	-0.6914	0.5437	+0.0454	+ 4	-60
38 B. Aurigæ	6.5	3.17	9.6	27 34.8	14 53.2	- 3 24.7	-0.2857	0.5448	0.0325	+27	-33
47 B. Aurigæ	6.0	+3.16	+ 9.2	+27 55.6	17 10.9	- 1 11.7	-0.5998	0.5453	+0.0270	+ 9	-53

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
354 B. Tauri	6.4	+3.11	+ 8.5	+27 52.5	1 22 14.0	+ 3 41.1	−0.4365	0.5460	+0.0147	+18	−41
β Tauri	1.8	3.11	7.8	28 32.3	2 0 35.8	+ 5 58.0	−1.1428	0.5464	+0.0089	−32	−90
107 B. Aurigæ	6.5	3.05	7.5	27 36.6	4 55.9	+10 9.2	−0.1006	0.5468	−0.0018	+37	−22
112 B. Aurigæ	5.7	3.03	7.7	26 52.4	5 29.3	+10 41.4	+0.7103	0.5469	0.0031	+90	+22
406 B. Tauri	5.6	3.00	6.5	27 56.7	11 39.1	− 7 21.6	−0.5381	0.5472	0.0183	+12	−45
136 Tauri	4.6	+2.98	+ 6.4	+27 35.7	12 42.8	− 6 20.0	−0.1724	0.5473	−0.0209	+33	−23
415 B. Tauri	6.1	2.95	6.0	27 34.2	16 8.9	− 3 1.0	−0.2319	0.5473	0.0294	+30	−30
37 Geminorum	5.7	2.68	3.0	25 29.0	3 16 33.5	− 3 26.9	+0.6162	0.5454	0.0884	+89	+ 9
39 Geminorum	6.2	2.67	2.6	26 11.7	18 7.4	− 1 56.2	−0.3034	0.5450	0.0921	+26	−39
40 Geminorum	6.3	2.67	2.6	26 1.9	18 25.5	− 1 38.8	−0.1525	0.5450	0.0928	+35	−31
48 Geminorum	5.8	+2.58	+ 2.2	+24 16.3	4 0 20.2	+ 4 3.9	+1.1813	0.5438	−0.1064	+90	+45
52 Geminorum	6.1	2.59	1.8	25 2.0	1 20.9	+ 5 2.5	+0.2399	0.5436	0.1087	+58	−13
A Geminorum	5.1	2.55	1.2	25 12.9	5 21.0	+ 8 54.5	−0.4106	0.5427	0.1177	+21	−45
176 B. Geminorum	6.3	2.48	0.4	24 33.1	12 7.3	− 8 32.9	−0.5342	0.5410	0.1326	+14	−57
181 B. Geminorum	6.0	2.48	0.4	24 25.0	12 34.0	− 8 7.1	−0.4457	0.5410	0.1335	+19	−51
187 B. Geminorum	6.3	+2.44	+ 0.6	+23 13.0	13 24.2	− 7 18.6	+0.7463	0.5407	−0.1353	+90	+11
192 B. Geminorum	6.3	2.42	0.7	22 36.1	14 31.0	− 6 14.0	+1.2631	0.5404	0.1377	+82	+51
κ Geminorum	3.7	2.46	0.0	24 36.2	14 58.9	− 5 47.1	−0.9770	0.5403	0.1387	−14	−65
82 Geminorum	6.3	2.42	+ 0.1	23 21.1	16 53.9	− 3 55.9	+0.1120	0.5398	0.1428	+50	−23
5 B. Cancri	6.4	2.38	− 0.8	23 49.0	22 40.0	+ 1 38.6	−1.2489	0.5382	0.1547	−40	−90
9 Cancri	6.2	+2.34	− 0.9	+22 52.7	5 1 8.8	+ 4 2.6	−0.6211	0.5374	−0.1596	+ 9	−65
μ Cancri	5.5	2.32	0.8	21 49.7	1 50.5	+ 4 42.9	+0.4033	0.5372	0.1610	+68	−10
49 B. Cancri	6.0	2.26	1.4	21 1.0	7 45.0	+10 25.8	+0.2954	0.5355	0.1724	+61	−17
η Cancri	5.5	2.20	2.0	20 43.8	13 35.6	− 7 55.1	−0.4354	0.5337	0.1833	+20	−57
39 Cancri	6.5	2.17	2.4	20 18.5	17 6.6	− 4 31.0	−0.6362	0.5326	0.1895	+ 9	−68
40 Cancri	6.5	+2.17	− 2.4	+20 16.3	17 9.1	− 4 28.5	−0.6049	0.5326	−0.1896	+11	−68
102 B. Cancri	6.5	2.16	2.3	19 58.2	17 14.3	− 4 23.5	−0.2979	0.5326	0.1897	+27	−50
ε Cancri	6.3	2.16	2.3	19 50.7	17 16.8	− 4 21.1	−0.1715	0.5327	0.1898	+34	−43
δ Cancri	4.2	2.12	2.4	18 28.0	19 18.9	− 2 22.9	+0.9193	0.5320	0.1933	+90	+15
139 B. Cancri	6.1	2.12	2.8	19 9.0	22 12.2	+ 0 24.7	−0.3792	0.5311	0.1982	+23	−55
X Cancri (*var.*)	6.2	+2.08	− 2.7	+17 33.3	6 0 26.6	+ 2 34.9	+0.8815	0.5305	−0.2019	+90	+12
π Cancri	5.6	1.98	3.5	15 17.6	10 2.8	+11 52.6	+1.2803	0.5278	0.2168	+87	+41
227 B. Cancri	6.4	1.97	3.9	+15 43.9	12 58.2	− 9 17.5	+0.1734	0.5271	0.2210	+53	−20
				NEW	*MOON.*						
370 B. Virginis	6.0	+1.68	−13.6	−11 11.5	10 21 24.4	− 4 7.4	+1.0482	0.5379	−0.2584	+79	+15
ψ Virginis	5.0	1.70	13.3	9 4.9	21 25.6	− 4 6.3	−1.1091	0.5379	0.2584	−21	−90
75 Virginis	5.6	1.82	15.1	14 55.8	11 14 59.5	−11 7.8	+0.4592	0.5484	0.2395	+64	−19
83 Virginis	5.6	1.88	15.4	15 45.4	20 9.3	− 6 8.8	+0.0786	0.5518	0.2324	+41	−30
85 Virginis	6.1	1.88	15.4	15 20.7	20 38.5	− 5 40.6	−0.4513	0.5521	0.2317	+14	−71
43 H. Virginis	5.5	+2.03	−16.1	−17 48.5	12 9 33.6	+ 6 47.0	−0.8140	0.5611	−0.2105	− 8	−90
231 G. Virginis	6.4	2.04	16.1	18 11.7	10 15.8	+ 7 27.6	−0.5704	0.5617	0.2092	+ 6	−81
236 G. Virginis	5.7	2.05	16.2	18 19.6	10 56.0	+ 8 6.3	−0.5770	0.5622	0.2080	+ 5	−82
9 G. Libræ	6.5	2.15	16.6	20 4.3	17 44.6	− 9 20.1	−0.1829	0.5670	0.1947	+23	−54
17 G. Libræ	6.4	2.22	16.7	20 49.2	22 26.6	− 4 48.6	−0.3168	0.5704	0.1848	+16	−68
18 G. Libræ	6.1	+2.23	−16.7	−20 58.4	22 52.3	− 4 23.8	−0.2411	0.5707	−0.1838	+20	−57
43 B. Libræ	5.7	2.35	17.8	21 2.3	13 3 1.5	− 0 24.1	−0.9201	0.5736	0.1746	−19	−90
47 G. Libræ	6.1	2.37	16.7	21 42.4	6 42.4	+ 3 8.3	−0.8712	0.5761	0.1659	−17	−90
64 G. Libræ	5.8	2.43	16.5	22 5.4	10 42.1	+ 6 58.8	−1.1269	0.5788	0.1562	−30	−90
153 B. Libræ	6.3	2.57	16.7	24 12.4	17 20.3	−10 38.7	+0.0308	0.5830	0.1392	+28	−42
42 Libræ	5.0	+2.62	−16.3	−23 32.8	20 9.1	− 7 56.5	−1.0162	0.5846	−0.1317	−30	−90
b Scorpii	4.7	2.72	16.5	25 29.9	14 0 18.3	− 3 57.1	+0.4323	0.5869	0.1202	+49	−10
A Scorpii	4.6	2.73	16.3	25 4.7	1 20.1	− 2 57.9	−0.1142	0.5875	0.1174	+19	−50
31 B. Scorpii	5.4	2.72	16.0	24 17.1	1 27.4	− 2 50.9	−0.9302	0.5876	0.1170	−25	−90
3 Scorpii	5.9	2.74	16.2	24 59.8	1 44.5	− 2 34.4	−0.2442	0.5876	0.1162	+13	−58
4 Scorpii	5.7	+2.76	−16.5	−26 1.2	2 3.4	− 2 16.3	+0.7539	0.5879	−0.1154	+64	0

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.		Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ									
		s	″	° ′	d	h m	h m				°	°
B. Scorpii	5.4	+2.76	−15.9	−24 35.5	14	3 16.0	− 1 6.6	−0.8282	0.5885	−0.1119	−19	−90
Scorpii	3.0	2.78	16.4	25 52.5		3 21.3	− 1 1.5	+0.4591	0.5885	0.1117	+50	−18
3 B. Scorpii	4.9	2.81	16.0	25 38.0		5 5.8	+ 0 38.7	+0.0252	0.5894	0.1067	+25	−42
B. Scorpii	6.4	2.80	15.6	24 29.8		5 19.7	+ 0 52.1	−1.1481	0.5895	0.1060	−43	−90
5 B. Scorpii	5.5	2.86	16.0	26 6.2		6 55.6	+ 2 24.1	+0.3101	0.5902	0.1014	+40	−26
5 B. Scorpii	6.0	+2.89	−15.4	−25 16.0		9 32.3	+ 4 54.5	−0.7912	0.5915	−0.0937	−19	−90
σ Scorpii	3.1	2.94	15.2	25 23.6		11 56.8	+ 7 13.1	−0.8790	0.5924	0.0865	−25	−90
Scorpii	1.2	3.02	15.0	26 14.9		15 4.0	+10 12.7	−0.2707	0.5936	0.0771	+ 7	−60
6 B. Scorpii	6.2	3.04	14.9	26 21.5		15 49.0	+10 55.8	−0.2173	0.5938	0.0748	+10	−56
4 B. Scorpii	6.4	3.16	14.5	27 18.1		20 41.8	− 8 23.5	+0.4086	0.5953	0.0597	+42	−20
8 B. Ophiuchi	6.2	+3.31	−12.8	−26 24.2	15	5 13.9	− 0 12.6	−0.8966	0.5969	−0.0329	−31	−90
5 G. Ophiuchi	6.1	3.38	12.8	27 39.7		7 17.6	+ 1 45.9	+0.3161	0.5971	0.0264	+34	−25
6 Ophi. (*1st star*)	5.4	3.35	13.0	26 29.0		8 25.9	+ 2 51.4	−0.9048	0.5972	0.0227	−32	−90
43 Ophiuchi	5.4	3.47	12.2	28 3.9		11 24.0	+ 5 42.1	+0.6433	0.5973	0.0132	+55	− 6
51 G. Ophiuchi	6.0	3.49	10.9	26 12.5		14 34.8	+ 8 45.0	−1.2626	0.5972	−0.0031	−63	−72
63 G. Ophiuchi	6.3	+3.61	−10.5	−27 50.8		18 54.1	−11 6.5	+0.4133	0.5969	+0.0107	+39	−20
X Sagittarii (*var.*)	4.4	3.64	10.2	27 48.1		20 30.5	− 9 34.1	+0.3894	0.5967	0.0158	+37	−21
4 G. Sagittarii	6.2	3.63	9.8	26 56.9		20 51.7	− 9 13.8	−0.4701	0.5966	0.0169	− 8	−75
10 G. Sagittarii	5.7	3.72	9.5	28 3.3		23 57.0	− 6 16.2	+0.7188	0.5961	0.0267	+62	− 2
66 B. Sagittarii	4.7	3.83	7.2	27 4.6	16	8 3.7	+ 1 30.5	+0.0464	0.5939	0.0521	+21	−41
68 G. Sagittarii	6.2	+3.88	− 6.2	−26 41.3		11 45.7	+ 5 3.4	−0.1342	0.5925	+0.0634	+13	−51
69 G. Sagittarii	6.3	3.89	6.2	26 48.6		11 54.2	+ 5 11.6	−0.0003	0.5924	0.0638	+20	−43
86 B. Sagittarii	6.5	3.89	6.1	26 38.3		12 13.8	+ 5 30.4	−0.1542	0.5923	0.0648	+12	−52
126 B. Sagittarii	5.7	3.94	4.0	25 5.9		18 21.6	+11 23.2	−1.2655	0.5895	0.0832	−58	−75
φ Sagittarii	3.3	4.01	4.6	27 4.8		18 38.9	+11 39.9	+0.7732	0.5894	0.0840	+63	+ 1
σ Sagittarii	2.1	+4.05	− 3.5	−26 24.3		22 23.4	− 8 44.7	+0.4209	0.5875	+0.0949	+46	−20
162 B. Sagittarii	6.4	4.02	2.7	24 59.5		23 36.7	− 7 34.3	−0.8980	0.5868	0.0984	−25	−90
127 G. Sagittarii	6.4	4.03	2.4	25 3.7	17	0 25.1	− 6 47.9	−0.7465	0.5864	0.1007	−15	−90
172 B. Sagittarii	5.8	4.04	2.4	24 57.9		1 13.5	− 6 1.4	−0.7625	0.5859	0.1030	−16	−90
189 B. Sagittarii	6.1	4.07	1.6	24 47.5		3 29.7	− 3 50.6	−0.6991	0.5846	0.1093	−12	−90
201 B. Sagittarii	5.9	+4.14	− 1.5	−26 3.0		5 26.5	− 1 58.5	+0.8014	0.5834	+0.1147	+64	+ 3
ψ Sagittarii	4.9	4.13	1.1	25 24.3		6 21.9	− 1 5.3	+0.2503	0.5828	0.1172	+38	−29
208 B. Sagittarii	6.1	4.10	− 0.7	24 19.5		6 23.0	− 1 4.2	−0.8470	0.5828	0.1172	−20	−90
χ Sagittarii	4.9	4.16	+ 0.2	24 40.5		10 14.9	+ 2 38.6	−0.0181	0.5803	0.1276	+25	−44
49 Sagittarii	5.5	4.14	0.4	24 7.8		10 20.8	+ 2 44.3	−0.5610	0.5802	0.1278	− 3	−82
51 Sagittarii	5.8	+4.22	+ 1.3	−24 54.3		14 34.0	+ 6 47.7	+0.7929	0.5773	+0.1387	+65	+ 2
h Sagittarii	4.7	4.23	1.2	25 4.3		14 50.1	+ 7 3.1	+1.0000	0.5772	0.1394	+65	+16
53 Sagittarii	6.3	4.19	2.0	23 37.3		16 7.3	+ 8 17.3	−0.2986	0.5762	0.1426	+12	−61
274 B. Sagittarii	6.1	4.20	2.1	23 37.4		16 14.4	+ 8 24.2	−0.2790	0.5762	0.1429	+13	−60
308 B. Sagittarii	6.3	4.27	3.1	24 9.2		22 1.8	−10 1.7	+1.1301	0.5720	0.1570	+66	+26
329 B. Sagittarii	6.1	+4.27	+ 4.5	−22 58.2	18	0 58.6	− 7 11.5	+0.3948	0.5698	+0.1638	+51	−22
336 B. Sagittarii	6.5	4.27	4.9	22 50.0		1 57.2	− 6 15.2	+0.4156	0.5690	0.1660	+53	−20
4 Capricorni	5.7	4.31	6.5	22 4.3		7 57.2	− 0 28.5	+0.6722	0.5645	0.1790	+67	− 6
υ Capricorni	5.3	4.27	9.8	18 26.1		17 26.8	+ 8 40.5	−1.2660	0.5571	0.1978	−44	−86
81 B. Capricorni	6.4	4.30	10.8	18 20.8		21 30.5	−11 24.5	−0.5398	0.5540	0.2051	+ 7	−78
19 Capricorni	5.7	+4.31	+11.4	−18 14.6		23 55.1	− 9 5.0	−0.1481	0.5522	+0.2092	+27	−52
21 Capricorni	6.5	4.32	12.1	17 51.6	19	2 37.0	− 6 28.7	+0.0280	0.5502	0.2136	+37	−42
URANUS	6.0	. . .	. . .	17 49.5		4 3.2	− 5 5.4	+0.3018	0.5502	0.2162	+51	−27
θ Capricorni	4.2	4.32	12.7	17 34.1		4 53.4	− 4 16.9	+0.2175	0.5484	0.2172	+47	−32
114 B. Capricorni	6.1	4.35	13.6	17 41.6		9 1.8	− 0 17.0	+1.2595	0.5454	0.2233	+72	+35
29 Capricorni	5.5	+4.29	+14.1	−15 31.3		9 20.4	+ 0 0.9	−0.9101	0.5452	+0.2238	−12	−90
42 Capricorni	5.1	4.32	16.6	14 25.4		21 16.1	+11 32.7	+0.7181	0.5369	0.2390	+76	− 5
44 Capricorni	6.0	4.34	16.9	14 47.0		21 58.5	−11 46.3	+1.2620	0.5365	0.2398	+75	+33
151 B. Capricorni	6.1	4.30	17.8	13 6.9	20	1 6.4	− 8 44.6	+0.2902	0.5344	0.2432	+55	−28
150 B. Aquarii	6.0	4.26	20.6	9 27.5		14 12.2	+ 3 56.0	−0.2424	0.5268	0.2546	+29	−57
ρ Aquarii	5.3	+4.24	+21.1	− 8 14.6		15 49.8	+ 5 30.6	−1.0929	0.5229	+0.2557	−19	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N. S.
		s	″	° ′	d h m	h m				° °
83 Virginis	5.6	+2.71	−20.2	−15 45.5	22 1 56.0	− 5 44.5	+0.1903	0.5542	−0.2346	+47 −33
85 Virginis	6.1	2.71	20.1	15 20.8	2 24.7	− 5 16.8	−0.3352	0.5547	0.2340	+20 −63
43 H. Virginis	5.5	2.92	20.4	17 48.6	15 5.5	+ 6 56.4	−0.7098	0.5672	0.2141	− 2 −90
231 G. Virginis	6.4	2.94	20.4	18 11.8	15 46.7	+ 7 36.1	−0.4706	0.5679	0.2129	+11 −73
236 G. Virginis	5.7	2.95	20.4	18 19.7	16 26.0	+ 8 13.9	−0.4779	0.5685	0.2117	+10 −73
9 G. Libræ	6.5	+3.07	−20.4	−20 4.3	23 3.5	− 9 23.6	−0.0993	0.5753	−0.1989	+28 −49
17 G. Libræ	6.4	3.15	20.3	20 49.3	23 3 36.6	− 5 1.1	−0.2378	0.5799	0.1893	+19 −57
18 G. Libræ	6.1	3.16	20.2	20 58.5	4 1.4	− 4 37.2	−0.1641	0.5803	0.1884	+23 −53
43 B. Libræ	5.7	3.26	20.7	21 2.3	8 1.8	− 0 46.4	−0.8363	0.5843	0.1793	−13 −90
47 G. Libræ	6.1	3.30	19.6	21 42.4	11 34.3	+ 2 37.7	−0.7931	0.5879	0.1708	−12 −90
64 G. Libræ	5.8	+3.36	−19.2	−22 5.4	15 24.3	+ 6 18.4	−1.0485	0.5916	−0.1612	−30 −90
153 B. Libræ	6.3	3.50	18.8	24 12.4	21 45.0	−11 36.5	+0.0744	0.5974	0.1442	+31 −39
42 Libræ	5.0	3.52	18.3	23 32.9	24 0 25.8	− 9 2.3	−0.9522	0.5998	0.1366	−26 −90
b Scorpii	4.7	3.62	18.0	25 29.9	4 22.8	− 5 15.3	+0.4554	0.6030	0.1251	+50 −18
A Scorpii	4.6	3.63	17.7	25 4.7	5 21.4	− 4 19.2	−0.0793	0.6038	0.1221	+20 −48
31 B. Scorpii	5.4	+3.62	−17.6	−24 17.1	5 28.3	− 4 12.6	−0.8751	0.6039	−0.1218	−22 −90
3 Scorpii	5.9	3.63	17.6	24 59.8	5 44.6	− 3 57.0	−0.2065	0.6041	0.1210	+14 −50
4 Scorpii	5.7	3.66	17.8	26 1.3	6 2.5	− 3 39.8	+0.7661	0.6043	0.1201	+64 0
40 B. Scorpii	5.4	3.64	17.3	24 35.5	7 11.4	− 2 33.8	−0.7781	0.6052	0.1166	−17 −90
π Scorpii	3.0	3.68	17.5	25 52.5	7 16.4	− 2 29.1	+0.4766	0.6053	0.1164	+50 −1
48 B. Scorpii	4.9	+3.68	−17.2	−25 38.0	8 55.4	− 0 54.3	+0.0511	0.6065	−0.1113	+26 −40
50 B. Scorpii	6.4	3.67	16.9	24 29.8	9 8.6	− 0 41.7	−1.0925	0.6066	0.1106	−38 −90
65 B. Scorpii	5.5	3.73	16.9	26 6.2	10 39.3	+ 0 45.1	+0.3259	0.6078	0.1059	+41 −25
85 B. Scorpii	6.0	3.74	16.2	25 16.0	13 7.5	+ 3 7.0	−0.7504	0.6094	0.0980	−17 −90
σ Scorpii	3.1	3.78	15.8	25 23.6	15 24.0	+ 5 17.5	−0.8390	0.6109	0.0907	−23 −90
α Scorpii	1.2	+3.84	−15.3	−26 14.9	18 20.6	+ 8 6.4	−0.2514	0.6126	−0.0810	+ 8 −59
116 B. Scorpii	6.2	3.85	15.2	26 21.5	19 3.0	+ 8 47.0	−0.2005	0.6130	0.0787	+10 −55
134 B. Scorpii	6.4	3.94	14.2	27 18.1	23 38.6	−10 49.5	+0.4009	0.6151	0.0632	+41 −21
118 B. Ophiuchi	6.2	4.00	12.2	26 24.1	25 7 39.5	− 3 9.9	−0.8785	0.6178	0.0355	−30 −90
95 G. Ophiuchi	6.1	4.06	11.8	27 39.7	9 35.5	− 1 19.1	+0.2958	0.6182	0.0287	+33 −30
36 Ophi. (*1st star*)	5.4	+4.01	−12.0	−26 28.9	10 39.5	− 0 17.9	−0.8907	0.6183	−0.0250	−31 −90
43 Ophiuchi	5.4	4.11	10.8	28 3.9	13 26.4	+ 2 21.5	+0.6077	0.6187	0.0151	+53 − 0
151 G. Ophiuchi	6.0	4.07	9.9	26 12.5	16 25.0	+ 5 12.2	−1.2456	0.6188	−0.0046	−60 −77
163 G. Ophiuchi	6.3	4.15	8.8	27 50.8	20 27.7	+ 9 4.1	+0.3746	0.6186	+0.0097	+36 −22
X Sagittarii (*var.*)	4.4	4.16	8.4	27 48.1	21 58.0	+10 30.3	+0.3493	0.6184	0.0150	+35 −33
4 G. Sagittarii	6.2	+4.14	− 8.3	−26 56.9	22 17.8	+10 49.3	−0.4848	0.6183	+0.0162	− 9 −70
10 G. Sagittarii	5.7	4.19	7.5	28 3.3	26 1 11.2	−10 25.0	+0.6645	0.6178	0.0263	+57 − 5
38 B. Sagittarii	4.7	4.23	6.3	28 28.1	5 12.7	− 6 34.2	+1.2077	0.6167	0.0404	+62 +40
48 G. Sagittarii	6.3	4.24	5.5	28 19.1	8 31.2	− 3 24.5	+1.2125	0.6154	0.0518	+62 +41
66 B. Sagittarii	4.7	4.19	5.3	27 4.5	8 46.6	− 3 9.8	+0.0022	0.6153	0.0527	+19 −43
68 G. Sagittarii	6.2	+4.19	− 4.3	−26 41.2	12 14.4	+ 0 8.9	−0.1773	0.6137	+0.0645	+10 −54
69 G. Sagittarii	6.3	4.19	4.2	26 48.6	12 22.4	+ 0 16.5	−0.0477	0.6137	0.0649	+17 −40
86 B. Sagittarii	6.5	4.18	4.2	26 38.3	12 40.8	+ 0 34.2	−0.1973	0.6135	0.0660	+ 9 −55
126 B. Sagittarii	5.7	4.14	2.5	25 5.9	18 25.4	+ 6 3.7	−1 2837	0.6102	0.0850	−63 −07
φ Sagittarii	3.3	4.21	2.4	27 4.8	18 41.6	+ 6 19.3	+0.6957	0.6100	0.0858	+62 − 4
σ Sagittarii	2.1	+4.18	− 1.4	−26 24.2	22 12.3	+ 9 40.8	+0.3497	0.6076	+0.0071	+41 −24
162 B. Sagittarii	6.4	4.13	1.1	24 59.5	23 21.1	+10 46.7	−0.9331	0.6068	0.1007	−27 −90
127 G. Sagittarii	6.4	4.14	0.8	25 3.7	27 0 6.5	+11 30.1	−0.7869	0.6063	0.1030	−18 −90
172 B. Sagittarii	5.8	4.13	0.8	24 57.9	0 52.0	−11 46.3	−0.8034	0.6057	0.1054	−19 −90
189 B. Sagittarii	6.1	4.12	− 0.1	24 47.5	3 0.1	− 9 43.6	−0.7444	0.6040	0.1119	−15 −90
201 B. Sagittarii	5.9	+4.16	+ 0.5	−26 3.0	4 50.0	− 7 58.4	+0.7126	0.6025	+0.1175	+64 − 3
ψ Sagittarii	4.9	4.14	0.7	25 24.2	5 42.1	− 7 8.5	+0.1758	0.6018	0.1201	+34 −33
208 B. Sagittarii	6.1	4.10	0.6	24 19.5	5 43.1	− 7 7.5	−0.8915	0.6018	0.1201	−23 −90
χ Sagittarii	4.9	4.10	1.7	24 40.4	9 21.6	− 3 38.2	−0.0892	0.5986	0.1307	+21 −48
49 Sagittarii	5.5	4.08	1.7	24 7.8	9 27.1	− 3 32.8	−0.6177	0.5985	0.1309	− 6 −88
51 Sagittarii	5.8	+4.10	+ 2.8	−24 54.3	13 26.1	+ 0 16.3	+0.6967	0.5949	+0.1421	+66 − 4

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JUNE.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.		Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		Δα	Δδ									
		s	″	° ′	d	h m	h m				°	°
Sagittarii	4.7	+4.10	+ 2.9	−25 4.3	**27**	13 41.4	+ 0 30.9	+0.8983	0.5947	+0.1428	+65	+ 9
Sagittarii	6.3	4.04	3.1	23 37.3		14 54.3	+ 1 40.8	−0.3681	0.5935	0.1461	+ 8	−66
B. Sagittarii	6.1	4.04	3.1	23 37.4		15 1.0	+ 1 47.3	−0.3491	0.5934	0.1463	+10	−66
B. Sagittarii	6.3	4.03	4.4	24 9.1		20 30.1	+ 7 3.1	+1.0203	0.5880	0.1606	+66	+17
B. Sagittarii	6.1	3.98	5.2	22 58.2		23 17.9	+ 9 44.2	+0.3007	0.5851	0.1674	+46	−27
B. Sagittarii	6.5	+3.97	+ 5.5	−22 50.0	**28**	0 13.7	+10 37.7	+0.3203	0.5841	+0.1697	+46	−26
Capricorni	5.7	3.91	6.8	22 4.3		5 56.6	− 7 52.7	+0.5675	0.5781	0.1824	+62	−12
Capricorni	5.3	3.73	8.3	18 26.2		15 2.1	+ 0 52.1	−1.3381	0.5684	0.2013	−57	−72
B. Capricorni	6.4	3.70	9.1	18 20.8		18 56.6	+ 4 37.9	−0.6289	0.5642	0.2084	+ 2	−87
Capricorni	5.7	3.67	9.6	18 14.6		21 16.1	+ 6 52.4	−0.2455	0.5617	0.2124	+22	−57
Capricorni	6.2	+3.69	+10.2	−19 21.8		23 18.9	+ 8 50.7	+1.3256	0.5595	+0.2158	+71	+46
Capricorni	6.5	3.64	10.1	17 51.6		23 52.6	+ 9 23.2	−0.0735	0.5589	0.2167	+31	−47
Capricorni	4.2	3.62	10.4	17 34.1	**29**	2 4.7	+11 30.6	+0.1120	0.5566	0.2202	+41	−37
B. Capricorni	6.1	3.58	11.3	17 41.6		6 5.9	− 8 36.7	+1.1379	0.5524	0.2260	+72	+23
URANUS	6.0	. . .	. . .	16 59.3		6 21.6	− 8 21.6	+0.4796	0.5533	0.2268	+63	−18
9 Capricorni	5.5	+3.53	+10.8	−15 31.3		6 24.1	− 8 19.1	−1.0008	0.5521	+0.2264	−18	−90
Capricorni	4.3	3.54	11.8	17 11.6		9 16.4	− 5 32.9	+1.3561	0.5492	0.2303	+70	+50
2 Capricorni	5.1	3.39	12.5	14 25.4		18 3.9	+ 2 56.7	+0.6047	0.5405	0.2407	+72	−11
4 Capricorni	6.0	3.39	12.8	14 47.1		18 45.6	+ 3 37.0	+1.1432	0.5399	0.2414	+75	+22
1 B. Capricorni	6.1	3.32	13.0	13 7.0		21 50.6	+ 6 35.9	+0.1813	0.5370	0.2445	+49	−34
0 B. Aquarii	6.0	+3.12	+13.9	− 9 27.6	**30**	10 49.5	− 4 50.4	−0.3458	0.5260	+0.2546	+23	−63
ρ Aquarii	5.3	3.09	13.8	8 14.7		12 26.9	− 3 16.2	−1.1926	0.5247	0.2555	−26	−90
6 B. Aquarii	6.1	3.03	14.0	6 59.1		17 54.6	+ 2 1.3	−1.1011	0.5207	0.2584	−19	−90
7 G. Aquarii	6.3	3.01	14.9	8 20.1		21 25.1	+ 5 25.3	+1.2148	0.5183	0.2598	+82	+27
7 Aquarii	6.4	+2.97	+14.9	− 7 24.2		23 52.1	+ 7 47.9	+0.8817	0.5167	+0.2607	+83	+ 3

JULY.

Name.	Mag.	Δα	Δδ	Apparent Declination.	d	h m	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
52 B. Aquarii	5.8	+2.88	+15.0	− 5 26.2	**1**	5 55.5	−10 19.6	+0.4081	0.5130	+0.2622	+66	−22
97 G. Aquarii	6.3	2.87	15.0	5 15.6		7 0.2	− 9 16.9	+0.5061	0.5124	0.2624	+73	−17
63 B. Aquarii	6.1	+2.85	+15.2	− 5 9.9		9 10.5	− 7 10.5	+0.9764	0.5112	+0.2628	+85	+ 9
22 B. Piscium	6.4	2.68	14.6	0 10.3		20 35.9	+ 3 54.8	−1.2889	0.5059	0.2631	−32	−90
13 Piscium	6.4	2.65	15.4	− 1 33.1	**2**	1 1.3	+ 8 12.5	+1.3380	0.5042	0.2626	+86	+39
16 Piscium	5.7	2.59	14.6	+ 1 38.1		3 22.2	+10 29.3	−1.4326	0.5034	0.2622	−59	−66
λ Piscium	4.6	2.56	14.8	1 19.0		6 21.9	−10 36.3	−0.3110	0.5025	0.2615	+27	−61
22 Piscium	5.8	+2.50	+14.8	+ 2 27.7		11 37.7	− 5 29.5	−0.1620	0.5012	+0.2601	+35	−52
25 Piscium	6.2	2.51	15.1	1 37.3		12 13.4	− 4 54.8	+0.8905	0.5010	0.2599	+90	+ 3
51 Piscium	5.6	2.28	14.6	6 29.4	**3**	9 17.1	− 8 26.8	+1.0390	0.4989	0.2494	+90	+14
36 B. Piscium	6.5	2.24	13.9	8 53.7		14 0.7	− 3 51.2	−0.3940	0.4991	0.2462	+23	−63
75 Piscium	6.3	2.11	13.1	12 30.3	**4**	3 33.4	+ 9 18.4	−1.0621	0.5007	0.2351	−16	−77
η Piscium	3.7	+2.00	+12.6	+14 54.7		16 44.5	− 1 53.3	−0.6842	0.5039	+0.2219	+ 7	−75
101 Piscium	6.2	1.98	12.8	14 13.9		19 0.2	+ 0 18.5	+0.5613	0.5046	0.2193	+79	− 9
105 Piscium	6.1	1.97	12.4	15 58.7		21 1.9	+ 2 16.7	−0.9146	0.5052	0.2170	− 7	−74
3 Arietis	6.4	1.94	12.1	16 59.5	**5**	0 37.9	+ 5 46.4	−1.2549	0.5065	0.2127	−34	−73
4 Arietis	5.8	1.93	12.2	16 32.2		1 28.0	+ 6 35.0	−0.5782	0.5068	0.2117	+13	−69
ι Arietis	5.1	+1.90	+12.0	+17 24.4		6 12.8	+11 11.5	−0.5453	0.5085	+0.2057	+14	−66
35 B. Arietis	6.4	1.87	11.8	17 50.9		9 29.4	− 9 37.7	−0.3660	0.5098	0.2014	+24	−55
47 B. Arietis	6.5	1.85	12.0	17 37.7		11 34.5	− 7 36.3	+0.2937	0.5107	0.1986	+61	−20
20 H^1. Arietis	6.4	1.85	12.1	16 49.8		12 24.3	− 6 48.0	+1.3394	0.5110	0.1974	+75	+53
15 Arietis	5.9	1.84	11.4	19 6.2		13 1.2	− 6 12.2	−1.0475	0.5113	0.1966	−17	−71
θ Arietis	5.6	+1.82	+11.4	+19 30.7		16 50.6	− 2 29.6	−0.7582	0.5130	+0.1911	+ 2	−70
26 Arietis	6.2	1.78	11.4	19 28.9		23 9.9	+ 3 38.2	+0.4530	0.5158	0.1817	+72	−10
ν Arietis	5.4	1.75	10.7	21 35.8	**6**	3 14.4	+ 7 35.3	−1.1602	0.5178	0.1752	−28	−68
μ Arietis	5.7	1.74	11.3	19 39.2		5 1.8	+ 9 19.4	+1.3029	0.5186	0.1724	+79	+52
ε Arietis (*mean*)	4.6	1.68	10.8	21 0.2		13 20.0	− 6 37.8	+1.1814	0.5228	0.1583	+90	+39
64 Arietis	5.8	+1.62	+ 9.6	+24 25.6	**7**	1 26.8	+ 5 6.0	−0.8300	0.5289	+0.1360	− 4	−66

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

THE STAR'S					AT CONJUNCTION IN R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N	S
		s	″	° ′	d h m	h m				°	°
7 Tauri	5.9	+1.59	+ 9.6	+24 11.0	7 6 17.2	+ 9 47.1	+0.0756	0.5313	+0.1264	+48	−23
11 Tauri	6.1	1.58	9.4	25 3.5	9 16.3	−11 19.6	−0.5276	0.5328	0.1204	+14	−55
16 Tauri	5.4	1.56	9.6	24 1.5	11 11.4	− 9 28.3	+0.8459	0.5337	0.1165	+90	+19
17 Tauri	3.8	1.56	9.6	23 51.0	11 13.6	− 9 26.2	+1.0454	0.5337	0.1164	+90	+33
18 Tauri	5.6	1.56	9.4	24 34.6	11 21.0	− 9 18.9	+0.2533	0.5338	0.1161	+59	−13
q Tauri	4.3	+1.56	+ 9.5	+24 12.3	11 22.6	− 9 17.4	+0.6693	0.5338	+0.1161	+90	+ 0
20 Tauri	4.1	1.56	9.5	24 6.3	11 40.2	− 9 0.4	+0.8127	0.5339	0.1155	+90	+18
21 Tauri	5.8	1.56	9.5	24 17.6	11 42.3	− 8 58.4	+0.6092	0.5339	0.1154	+87	+ 6
22 Tauri	6.5	1.56	9.5	24 16.0	11 46.3	− 8 54.5	+0.6462	0.5340	0.1153	+90	+ 8
η Tauri	3.0	1.56	9.6	23 50.7	12 27.3	− 8 14.9	+1.1911	0.5343	0.1139	+90	+45
28 Tauri	5.2	+1.55	+ 9.5	+23 52.8	13 15.2	− 7 28.5	+1.2429	0.5347	+0.1122	+83	+51
14 H. Tauri	5.3	1.56	9.1	25 19.6	13 45.6	− 6 59.0	−0.3058	0.5349	0.1111	+26	−41
p Tauri	5.6	1.52	8.7	26 15.7	23 17.8	+ 2 14.2	−0.3825	0.5393	0.0905	+22	−44
φ Tauri	5.0	1.50	8.3	27 9.0	8 3 40.1	+ 6 27.9	−0.9939	0.5411	0.0808	−17	−63
χ Tauri	5.3	1.49	8.7	25 25.9	4 43.1	+ 7 28.8	+0.9974	0.5415	0.0784	+90	+33
17 B. Aurigæ	6.0	+1.46	+ 7.7	+27 45.5	18 24.4	− 3 17.8	−0.7284	0.5463	+0.0463	+ 1	−01
38 B. Aurigæ	6.5	1.44	7.5	27 34.8	23 44.5	+ 1 51.4	−0.3178	0.5478	0.0334	+25	−34
47 B. Aurigæ	6.0	1.43	7.3	27 55.6	9 2 1.8	+ 4 3.9	−0.6311	0.5484	0.0278	+ 7	−55
354 B. Tauri	6.4	1.42	7.1	27 52.4	7 3.8	+ 8 55.5	−0.4639	0.5494	0.0154	+17	−43
β Tauri	1.8	1.42	6.8	28 32.3	9 25.0	+11 11.8	−1.1698	0.5498	+0.0096	−35	−61
107 B. Aurigæ	6.5	+1.40	+ 6.8	+27 36.6	13 43.9	− 8 38.2	−0.1229	0.5504	−0.0011	+36	−21
112 B. Aurigæ	5.7	1.39	+ 6.9	26 52.4	14 17.2	− 8 6.2	+0.6898	0.5505	0.0025	+90	+21
				NEW	*MOON.*						
π Cancri	5.6	+1.41	− 1.7	+15 17.7	13 19 4.7	− 6 40.8	+1.3093	0.5235	−0.2150	+83	+45
227 B. Cancri	6.4	+1.43	− 1.8	+15 43.9	22 3.2	− 3 47.8	+0.1922	0.5224	−0.2190	+54	−27
7 Leonis	6.2	1.45	2.7	14 45.5	14 5 20.8	+ 3 16.3	−0.3946	0.5197	0.2283	+23	−60
11 Leonis	6.5	1.46	2.8	14 43.9	6 25.1	+ 4 18.7	−0.6105	0.5194	0.2295	+11	−73
ψ Leonis	5.6	1.47	3.1	14 24.6	9 17.1	+ 7 5.4	−0.9283	0.5184	0.2328	− 7	−70
18 Leonis	5.8	1.45	3.7	12 12.1	10 38.6	+ 8 24.4	+1.1182	0.5180	0.2344	+90	+23
19 Leonis	6.4	+1.45	− 3.7	+11 57.6	11 10.3	+ 8 55.1	+1.2508	0.5179	−0.2349	+90	+35
R Leonis (*var.*)	5–10	1.45	3.8	11 49.4	11 14.1	+ 8 58.8	+1.3838	0.5178	0.2350	+72	+55
ν Leonis	5.0	1.49	4.0	12 51.0	16 36.8	− 9 48.3	−0.9931	0.5163	0.2406	−10	−77
A Leonis	4.6	1.49	5.0	10 24.8	21 33.2	− 5 0.8	+0.4052	0.5150	0.2453	+67	−20
44 Leonis	5.9	1.54	6.0	9 12.9	15 6 24.8	+ 3 35.0	−0.5280	0.5132	0.2526	+16	−72
48 Leonis	5.2	+1.55	− 6.8	+ 7 23.4	11 19.4	+ 8 20.8	+0.1602	0.5125	−0.2561	+52	−34
35 Sextantis	6.1	1.56	7.8	5 11.5	15 43.2	−11 23.3	+1.3541	0.5120	0.2588	+83	+42
37 Sextantis	6.3	1.59	7.5	6 49.2	17 7.3	−10 1.7	−0.7308	0.5119	0.2596	+ 5	−83
d Leonis	5.0	1.62	8.8	4 4.3	16 0 34.2	− 2 48.1	+0.2235	0.5117	0.2632	+56	−31
*p*⁴ Leonis	5.7	1.62	9.6	2 24.9	3 51.3	+ 0 23.1	+1.1014	0.5117	0.2644	+90	−17
75 Leonis	5.4	+1.68	−10.0	+ 2 28.5	9 9.8	+ 5 32.2	−0.3715	0.5121	−0.2660	+24	−04
76 Leonis	6.0	1.68	10.1	2 6.8	10 0.2	+ 6 21.0	−0.2151	0.5121	0.2663	+32	−55
359 B. Leonis	6.3	1.69	10.7	0 35.8	12 15.1	+ 8 31.9	+0.7784	0.5124	0.2667	+90	− 3
79 Leonis	5.5	1.70	10.4	+ 1 52.3	12 37.6	+ 8 53.7	−0.6597	0.5124	0.2668	+ 9	−86
υ Leonis	4.5	1.74	11.5	− 0 21.5	19 13.3	− 8 42.3	−0.0867	0.5136	0.2675	+39	−48
431 B. Leonis	6.2	+1.73	−12.1	− 1 58.2	19 57.9	− 7 59.1	+1.3998	0.5137	−0.2677	+77	+48
78 B. Virginis	6.5	1.90	14.3	5 15.0	17 14 1.5	+ 9 31.7	−0.0100	0.5192	0.2653	+42	−44
q Virginis	5.3	1.99	16.1	8 59.3	23 38.4	− 5 9.3	+1.3241	0.5237	0.2613	+81	+35
χ Virginis	4.8	2.03	15.7	7 31.9	18 2 18.3	− 2 34.5	−0.8739	0.5251	0.2598	− 4	−00
370 B. Virginis	6.0	2.11	17.2	11 11.6	9 33.3	+ 4 26.7	+1.0317	0.5294	0.2550	+79	+15
ψ Virginis	5.0	+2.12	−16.5	− 9 4.9	9 34.5	+ 4 27.8	−1.1456	0.5294	−0.2550	−23	−00
75 Virginis	5.6	2.37	18.8	14 55.9	19 3 31.0	− 2 11.2	+0.4237	0.5422	0.2375	+61	−21
83 Virginis	5.6	2.45	19.1	15 45.4	8 45.6	− 2 52.7	+0.0375	0.5465	0.2308	+39	−42
85 Virginis	6.1	2.46	19.0	15 20.8	9 15.1	+ 3 21.2	−0.4949	0.5469	0.2302	+12	−74
43 H. Virginis	5.5	2.68	19.5	17 48.6	22 17.8	− 8 3.7	−0.8643	0.5583	0.2101	−11	−00
231 G. Virginis	6.4	+2.70	−19.5	−18 11.8	23 0.2	− 7 22.8	−0.6207	0.5590	−0.2089	+ 2	−86

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
G. Virginis	5.7	+2.71	−19.6	−18 19.7	19 23 40.7	− 6 43.8	−0.6276	0.5596	−0.2077	+ 2	−87
G. Libræ	6.5	2.85	19.8	20 4.3	20 6 30.4	− 0 9.0	−0.2368	0.5659	0.1949	+20	−57
G. Libræ	6.4	2.94	19.8	20 49.3	11 12.0	+ 4 22.0	−0.3725	0.5703	0.1854	+13	−66
G. Libræ	6.1	2.95	19.8	20 58.5	11 37.6	+ 4 46.7	−0.2973	0.5707	0.1845	+16	−61
B. Libræ	5.7	3.07	20.4	21 2.3	15 45.7	+ 8 45.3	−0.9755	0.5745	0.1754	−22	−90
G. Libræ	6.1	+3.10	−19.4	−21 42.4	19 24.9	−11 43.9	−0.9277	0.5779	−0.1670	−20	−90
G. Libræ	5.8	3.18	19.0	22 5.4	23 22.2	− 7 55.9	−1.1826	0.5815	0.1575	−41	−90
3 B. Libræ	6.3	3.34	18.9	24 12.4	21 5 55.1	− 1 38.6	−0.0348	0.5873	0.1407	+25	−45
2 Libræ	5.0	3.38	18.3	23 32.9	8 41.1	+ 1 0.7	−1.0738	0.5896	0.1333	−34	−90
Scorpii	4.7	3.49	18.3	25 29.9	12 45.7	+ 4 55.4	+0.3601	0.5929	0.1219	+44	−23
Scorpii	4.6	+3.50	−18.0	−25 4.7	13 46.1	+ 5 53.3	−0.1814	0.5937	−0.1190	+15	−54
1 B. Scorpii	5.4	3.49	17.7	24 17.1	13 53.2	+ 6 0.1	−0.9892	0.5938	0.1187	−29	−90
3 Scorpii	5.9	3.51	17.9	24 59.8	14 10.0	+ 6 16.2	−0.3102	0.5940	0.1179	+ 9	−63
4 Scorpii	5.7	3.53	18.2	26 1.3	14 28.5	+ 6 34.0	+0.6776	0.5942	0.1170	+63	− 5
0 B. Scorpii	5.4	3.53	17.5	24 35.5	15 39.6	+ 7 42.2	−0.8885	0.5951	0.1136	−23	−90
π Scorpii	3.0	+3.56	−17.9	−25 52.5	15 44.8	+ 7 47.1	+0.3852	0.5952	−0.1133	+45	−22
8 B. Scorpii	4.9	3.58	17.5	25 38.0	17 26.9	+ 9 25.0	−0.0447	0.5964	0.1083	+22	−46
0 B. Scorpii	6.4	3.57	17.2	24 29.8	17 40.5	+ 9 38.0	−1.2051	0.5966	0.1077	−48	−88
5 B. Scorpii	5.5	3.64	17.3	26 6.3	19 14.0	+11 7.8	+0.2364	0.5977	0.1030	+36	−30
5 B. Scorpii	6.0	3.66	16.6	25 16.0	21 46.8	−10 25.9	−0.8527	0.5995	0.0953	−23	−90
σ Scorpii	3.1	+3.71	−16.2	−25 23.7	22 0 7.4	− 8 11.2	−0.9396	0.6010	−0.0881	−29	−90
α Scorpii	1.2	3.78	15.9	26 14.9	3 9.4	− 5 16.9	−0.3395	0.6028	0.0786	+ 3	−65
16 B. Scorpii	6.2	3.80	15.7	26 21.5	3 53.1	− 4 35.0	−0.2871	0.6032	0.0763	+ 6	−61
τ Scorpii	2.9	3.87	15.9	28 2.7	5 31.0	− 3 1.3	+1.2744	0.6041	0.0711	+62	+55
34 B. Scorpii	6.4	3.91	15.0	27 18.1	8 36.8	− 0 3.4	+0.3287	0.6056	0.0611	+37	−25
18 B. Ophiuchi	6.2	+4.02	−12.8	−26 24.2	16 51.3	+ 7 49.9	−0.9573	0.6089	−0.0338	−35	−90
95 G. Ophiuchi	6.1	4.09	12.6	27 39.7	18 50.4	+ 9 43.8	+0.2349	0.6094	0.0271	+29	−30
36 Ophi. (*1st star*)	5.4	4.05	12.7	26 29.0	19 56.1	+10 46.7	−0.9653	0.6097	0.0234	−36	−90
43 Ophiuchi	5.4	4.17	11.7	28 3.9	22 47.4	−10 29.5	+0.5555	0.6102	−0.0137	+48	−12
63 G. Ophiuchi	6.3	4.26	9.7	27 50.8	23 5 59.1	− 3 36.5	+0.3284	0.6109	+0.0109	+33	−25
X Sagittarii (*var.*)	4.4	+4.28	− 9.2	−27 48.1	7 31.5	− 2 8.2	+0.3047	0.6108	+0.0161	+32	−26
4 G. Sagittarii	6.2	4.26	9.0	26 56.9	7 51.8	− 1 48.7	−0.5383	0.6108	0.0173	−12	−81
10 G. Sagittarii	5.7	4.34	8.3	28 3.3	10 49.1	+ 1 0.9	+0.6274	0.6106	0.0274	+54	− 7
38 B. Sagittarii	4.7	4.40	7.2	28 28.2	14 55.8	+ 4 56.9	+1.1810	0.6100	0.0413	+62	+36
48 G. Sagittarii	6.3	4.43	6.3	28 19.1	18 18.3	+ 8 10.6	+1.1896	0.6091	0.0526	+62	+37
66 B. Sagittarii	4.7	+4.38	− 5.9	−27 4.5	18 34.1	+ 8 25.8	−0.0319	0.6091	+0.0535	+17	−45
68 G. Sagittarii	6.2	4.41	4.8	26 41.2	22 5.8	+11 48.3	−0.2085	0.6080	0.0652	+ 9	−56
69 G. Sagittarii	6.3	4.41	4.8	26 48.6	22 13.9	+11 56.1	−0.0774	0.6079	0.0656	+16	−48
86 B. Sagittarii	6.5	4.40	4.7	26 38.3	22 32.6	−11 46.0	−0.2280	0.6078	0.0667	+ 8	−57
φ Sagittarii	3.3	4.48	2.9	27 4.8	24 4 39.6	− 5 54.6	+0.6803	0.6051	0.0865	+61	− 5
σ Sagittarii	2.1	+4.47	− 1.7	−26 24.2	8 13.4	− 2 29.9	+0.3360	0.6032	+0.0977	+41	−24
162 B. Sagittarii	6.4	4.42	1.2	24 59.5	9 23.2	− 1 23.1	−0.9543	0.6026	0.1013	−29	−90
127 G. Sagittarii	6.4	4.43	0.9	25 3.7	10 9.3	− 0 38.9	−0.8060	0.6021	0.1037	−19	−90
172 B. Sagittarii	5.8	4.43	0.8	24 57.9	10 55.4	+ 0 5.3	−0.8214	0.6016	0.1060	−20	−90
189 B. Sagittarii	6.1	4.44	− 0.1	24 47.5	13 5.1	+ 2 9.5	−0.7589	0.6003	0.1126	−16	−90
201 B. Sagittarii	5.9	+4.49	+ 0.3	−26 3.0	14 56.4	+ 3 56.2	+0.7096	0.5990	+0.1181	+64	− 3
ψ Sagittarii	4.9	4.47	0.7	25 24.2	15 49.1	+ 4 46.7	+0.1706	0.5985	0.1207	+33	−34
208 B. Sagittarii	6.1	4.44	0.8	24 19.5	15 50.1	+ 4 47.6	−0.9029	0.5985	0.1207	−24	−90
χ Sagittarii	4.9	4.46	1.8	24 40.4	19 30.9	+ 8 19.3	−0.0910	0.5958	0.1314	+21	−49
49 Sagittarii	5.5	4.44	1.9	24 7.7	19 36.6	+ 8 24.8	−0.6221	0.5957	0.1317	− 6	−89
51 Sagittarii	5.8	+4.48	+ 3.0	−24 54.3	23 37.7	−11 43.9	+0.7040	0.5926	+0.1428	+65	− 4
h Sagittarii	4.7	4.49	3.1	25 4.3	23 53.1	−11 29.2	+0.9066	0.5924	0.1435	+65	+ 9
53 Sagittarii	6.3	4.43	3.5	23 37.3	25 1 6.6	−10 18.7	−0.3636	0.5915	0.1469	+ 9	−66
274 B. Sagittarii	6.1	4.44	3.6	23 37.4	1 13.4	−10 12.2	−0.3444	0.5914	0.1472	+10	−65
308 B. Sagittarii	6.3	4.46	4.9	24 9.1	6 44.6	− 4 54.3	+1.0369	0.5867	0.1615	+66	+18
329 B. Sagittarii	6.1	+4.42	+ 6.0	−22 58.2	9 33.2	− 2 12.3	+0.3186	0.5843	+0.1685	+46	−26

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

JULY.

The Star's					At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
336 B. Sagittarii	6.5	+4.41	+ 6.2	−22 50.0	25 10 29.2	− 1 18.6	+0.3395	0.5834	+0.1707	+48	−25
4 Capricorni	5.7	4.39	7.8	22 4.3	16 13.0	+ 4 11.9	+0.5941	0.5782	0.1840	+63	−11
υ Capricorni	5.3	4.25	10.1	18 26.1	26 1 18.3	−11 3.6	−1.3003	0.5696	0.2030	−49	−81
81 B. Capricorni	6.4	4.24	11.0	18 20.8	5 12.1	− 7 18.5	−0.5858	0.5659	0.2102	+ 4	−82
19 Capricorni	5.7	4.22	11.6	18 14.6	7 31.1	− 5 4.6	−0.1997	0.5636	0.2144	+24	−55
21 Capricorni	6.5	+4.21	+12.2	−17 51.6	10 6.8	− 2 34.5	−0.0248	0.5612	+0.2187	+34	−45
θ Capricorni	4.2	4.19	12.6	17 34.1	12 18.1	− 0 27.9	+0.1631	0.5591	0.2223	+44	−35
Uranus	6.0	. . .	. . .	17 16.4	14 54.0	+ 2 2.4	+0.4480	0.5583	0.2268	+60	−20
114 B. Capricorni	6.1	4.17	13.6	17 41.6	16 17.6	+ 3 23.1	+1.1909	0.5555	0.2283	+72	+35
29 Capricorni	5.5	4.11	13.4	15 31.3	16 35.6	+ 3 40.4	−0.9415	0.5551	0.2288	−14	−90
42 Capricorni	5.1	+4.02	+15.5	−14 25.4	27 4 8.5	− 9 10.6	+0.6723	0.5446	+0.2436	+75	− 8
44 Capricorni	6.0	4.03	15.8	14 47.1	4 49.7	− 8 30.8	+1.2087	0.5440	0.2443	+75	+28
151 B. Capricorni	6.1	3.97	16.2	13 6.9	7 52.4	− 5 34.3	+0.2546	0.5414	0.2475	+53	−30
150 B. Aquarii	6.0	3.80	17.8	9 27.5	20 40.0	+ 6 48.1	−0.2561	0.5313	0.2580	+28	−55
ρ Aquarii	5.3	3.77	17.9	8 14.6	22 15.7	+ 8 20.8	−1.0955	0.5301	0.2590	−19	−90
170 B. Aquarii	6.0	+3.75	+18.0	− 7 37.2	23 52.4	+ 9 54.4	−1.3220	0.5290	+0.2600	−39	−87
186 B. Aquarii	6.1	3.72	18.3	6 59.1	28 3 37.9	−10 27.3	−0.9991	0.5264	0.2620	−12	−90
167 G. Aquarii	6.3	3.72	19.1	8 20.0	7 4.6	− 7 7.1	+1.3025	0.5241	0.2635	+82	+35
67 Aquarii	6.4	3.68	19.3	7 24.2	9 28.9	− 4 47.3	+0.9740	0.5226	0.2644	+83	− 6
252 B. Aquarii	5.8	3.61	19.6	5 26.1	15 25.3	+ 0 58.1	+0.5085	0.5191	0.2660	+73	−17
197 G. Aquarii	6.3	+3.60	+19.7	− 5 15.5	16 28.7	+ 1 59.6	+0.6065	0.5185	+0.2662	+80	−12
263 B. Aquarii	6.1	3.58	19.9	5 9.8	18 36.3	+ 4 3.3	+1.0744	0.5174	0.2666	+85	−15
22 B. Piscium	6.4	3.43	19.9	− 0 10.2	29 5 47.6	− 9 5.5	−1.1642	0.5122	0.2669	−21	−90
16 Piscium	5.7	3.37	19.9	+ 1 38.2	12 25.3	− 2 39.7	−1.3027	0.5098	0.2659	−34	−86
λ Piscium	4.6	′3.35	20.1	1 19.1	15 21.1	+ 0 10.9	−0.1901	0.5088	0.2652	+33	−54
19 Piscium	5.4	+3.32	+19.9	+ 3 1.2	17 36.3	+ 2 22.2	−1.3940	0.5082	+0.2645	−47	−78
22 Piscium	5.8	3.31	20.2	2 27.8	20 30.2	+ 5 11.0	−0.0402	0.5074	0.2636	+41	−45
25 Piscium	6.2	3.31	20.5	1 37.4	21 5.0	+ 5 44.8	+1.0027	0.5073	0.2634	+90	+10
51 Piscium	5.6	3.12	20.2	6 29.5	30 17 42.3	+ 1 46.1	+1.1551	0.5045	0.2523	+90	+22
136 B. Piscium	6.5	3.07	19.5	8 53.8	22 20.3	+ 6 16.1	−0.2649	0.5044	0.2489	+30	−50
75 Piscium	6.3	+2.97	+18.7	+12 30.4	31 11 37.8	− 4 49.4	−0.9282	0.5054	+0.2372	− 7	−77

AUGUST.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
η Piscium	3.7	+2.88	+17.9	+14 54.8	1 0 35.8	+ 7 45.8	−0.5562	0.5078	+0.2234	+14	−70
101 Piscium	6.2	+2.87	+18.1	+14 13.9	2 49.4	+ 9 55.5	+0.6796	0.5083	+0.2207	+90	− 3
105 Piscium	6.1	2.86	17.5	15 58.8	4 49.4	+11 52.0	−0.7862	0.5088	0.2183	+ 1	−74
3 Arietis	6.4	2.83	17.1	16 59.5	8 22.3	− 8 41.4	−1.1254	0.5098	0.2139	−22	−73
4 Arietis	5.8	2.83	17.2	16 32.3	9 11.6	− 7 53.6	−0.4536	0.5100	0.2128	+19	−62
ι Arietis	5.1	2.80	16.9	17 24.5	13 52.7	− 3 20.9	−0.4229	0.5114	0.2066	+21	−50
35 B. Arietis	6.4	+2.77	+16.6	+17 51.0	17 6.9	− 0 12.5	−0.2459	0.5125	+0.2022	+30	−45
47 B. Arietis	6.5	2.76	16.7	17 37.8	19 10.4	+ 1 47.3	+0.4089	0.5132	0.1992	+68	−14
15 Arietis	5.9	2.76	16.1	19 6.3	20 36.2	+ 3 10.5	−0.9248	0.5138	0.1972	− 8	−71
θ Arietis	5.6	2.73	15.9	19 30.8	2 0 23.1	+ 6 50.6	−0.6391	0.5151	0.1916	+ 9	−69
26 Arietis	6.2	2.69	15.7	19 29.0	6 38.6	−11 5.4	+0.5627	0.5176	0.1819	+81	− 4
ν Arietis	5.4	+2.67	+14.8	+21 35.9	10 41.0	− 7 10.4	−1.0444	0.5193	+0.1753	−18	−68
ε Arietis (*mean*)	4.6	2.59	14.6	21 0.3	20 42.1	+ 2 31.9	+1.2813	0.5236	0.1581	+81	+50
64 Arietis	5.8	2.54	12.7	24 25.6	3 8 44.9	− 9 48.2	−0.7290	0.5290	0.1355	+ 2	−60
7 Tauri	5.9	2.50	12.6	24 11.0	13 34.3	− 5 8.1	+0.1706	0.5311	0.1259	+53	−18
11 Tauri	6.1	2.49	12.1	25 3.5	16 32.8	− 2 15.4	−0.4326	0.5324	0.1198	+19	−40
16 Tauri	5.4	+2.46	+12.3	+24 1.6	18 27.5	− 0 24.5	+0.9357	0.5333	+0.1158	+90	+25
17 Tauri	3.8	2.46	12.3	23 51.0	18 29.7	− 0 22.4	+1.1347	0.5333	0.1158	+90	+40
18 Tauri	5.6	2.46	12.1	24 34.6	18 37.1	− 0 15.1	+0.3447	0.5333	0.1155	+65	− 8
q Tauri	4.3	2.46	12.2	24 12.3	18 38.7	− 0 13.6	+0.7595	0.5333	0.1154	+90	+15
20 Tauri	4.1	2.46	12.2	24 6.4	18 56.3	+ 0 3.4	+0.9023	0.5335	0.1148	+90	+23
21 Tauri	5.8	+2.46	+12.2	+24 17.6	18 58.4	+ 0 5.4	+0.6993	0.5335	+0.1147	+90	+10

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
Tauri	6.5	+2.46	+12.2	+24 16.0	3 19 2.3	+ 0 9.2	+0.7362	0.5335	+0.1146	+90	+13
Tauri	3.0	2.45	12.3	23 50.8	19 43.2	+ 0 48.7	+1.2792	0.5338	0.1132	+75	+56
H. Tauri	5.3	2.46	11.6	25 19.6	21 1.3	+ 2 4.3	−0.2143	0.5344	0.1105	+31	−36
Tauri	5.6	2.40	10.7	26 15.8	4 6 32.5	+11 16.6	−0.2968	0.5383	0.0898	+26	−39
Tauri	5.0	2.38	10.0	27 9.1	10 54.5	− 8 30.2	−0.9098	0.5400	0.0800	−10	−63
Tauri	5.3	+2.35	+10.6	+25 26.0	11 57.4	− 7 29.3	−1.0763	0.5404	+0.0776	+90	+39
7 B. Aurigæ	6.0	2.29	8.7	27 45.5	5 1 38.5	+ 5 44.0	−0.6547	0.5449	0.0456	+ 6	−58
3 B. Aurigæ	6.5	2.25	8.3	27 34.8	6 58.7	+10 53.1	−0.2485	0.5463	0.0327	+29	−30
7 B. Aurigæ	6.0	2.24	8.0	27 55.6	9 16.1	−10 54.1	−0.5627	0.5469	0.0271	+11	−50
4 B. Tauri	6.4	2.20	7.6	27 52.5	14 18.2	− 6 2.5	−0.3992	0.5480	0.0147	+21	−38
5 Tauri	1.8	+2.20	+ 7.0	+28 32.3	16 39.5	− 3 46.1	−1.1054	0.5483	+0.0089	−28	−61
7 B. Aurigæ	6.5	2.16	7.0	27 36.6	20 58.4	+ 0 23.9	−0.0633	0.5490	−0.0018	+40	−18
2 B. Aurigæ	5.7	2.14	7.1	26 52.4	21 31.8	+ 0 56.1	+0.7475	0.5491	0.0032	+90	+24
6 B. Tauri	5.6	2.12	6.3	27 56.7	6 3 39.8	+ 6 51.4	−0.5009	0.5496	0.0185	+15	−45
6 Tauri	4.6	2.11	6.3	27 35.7	4 43.2	+ 7 52.6	−0.1354	0.5497	0.0211	+35	−23
5 B. Tauri	6.1	+2.09	+ 5.9	+27 34.2	8 8.2	+11 10.4	−0.1950	0.5499	−0.0296	+32	−27
7 Geminorum	5.7	1.92	3.9	25 29.0	7 8 24.6	+10 36.5	+0.6501	0.5480	0.0890	+90	+11
9 Geminorum	6.2	1.91	3.7	26 11.7	9 58.0	−11 53.4	−0.2695	0.5477	0.0927	+28	−37
0 Geminorum	6.3	1.92	3.6	26 1.9	10 15.9	−11 36.1	−0.1186	0.5477	0.0934	+37	−29
8 Geminorum	5.8	1.86	3.3	24 16.4	16 8.9	− 5 55.1	+1.2138	0.5464	0.1071	+87	+48
52 Geminorum	6.1	+1.87	+ 3.0	+25 2.1	17 9.2	− 4 56.9	+0.2725	0.5462	−0.1094	+60	−10
A Geminorum	5.1	1.85	2.6	25 12.9	21 8.1	− 1 6.1	−0.3789	0.5452	0.1185	+22	−46
76 B. Geminorum	6.3	1.82	2.0	24 33.1	8 3 52.7	+ 5 24.8	−0.5044	0.5433	0.1334	+15	−55
81 B. Geminorum	6.0	1.81	2.0	24 25.0	4 19.2	+ 5 50.3	−0.4160	0.5431	0.1344	+20	−50
87 B. Geminorum	6.3	1.79	+ 2.1	23 13.0	5 9.3	+ 6 38.7	+0.7762	0.5428	0.1361	+90	+13
				NEW	*MOON.*						
d Leonis	5.0	+1.55	− 7.9	+ 4 4.3	12 6 32.3	+ 4 57.5	+0.1932	0.5163	−0.2659	+54	−33
p^4 Leonis	5.7	1.53	8.5	2 24.9	9 46.6	+ 8 5.9	+1.0656	0.5163	0.2671	+90	+14
75 Leonis	5.4	1.58	9.0	2 28.5	15 0.7	−10 49.4	−0.4013	0.5165	0.2687	+23	−66
76 Leonis	6.0	+1.57	− 9.1	+ 2 6.8	15 50.4	−10 1.3	−0.2460	0.5166	−0.2689	+31	−57
359 B. Leonis	6.3	1.57	9.5	0 35.8	18 3.6	− 7 52.1	+0.7423	0.5168	0.2693	+90	− 5
79 Leonis	5.5	1.59	9.3	+ 1 52.3	18 25.7	− 7 30.7	−0.6891	0.5168	0.2693	+ 8	−90
υ Leonis	4.5	1.60	10.2	− 0 21.4	13 0 56.5	− 1 11.7	−0.1203	0.5176	0.2700	+37	−50
431 B. Leonis	6.2	1.59	10.6	1 58.1	1 40.5	− 0 29.1	+1.3598	0.5178	0.2700	+83	+41
78 B. Virginis	6.5	+1.69	−12.6	− 5 15.0	19 33.0	− 7 9.5	−0.0470	0.5223	−0.2670	+40	−46
q Virginis	5.3	1.75	14.2	8 59.2	14 5 5.8	+ 2 5.4	+1.2848	0.5260	0.2626	+81	+33
χ Virginis	4.8	1.79	13.9	7 31.9	7 44.9	+ 4 39.5	−0.9110	0.5272	0.2609	− 6	−90
370 B. Virginis	6.0	1.84	15.3	11 11.5	14 58.2	+11 38.9	+0.9939	0.5308	0.2557	+79	+11
ψ Virginis	5.0	1.86	14.7	9 4.9	14 59.5	+11 40.2	−1.1838	0.5308	0.2557	−26	−90
75 Virginis	5.6	+2.06	−17.0	−14 55.8	15 8 56.1	+ 5 1.3	+0.3879	0.5418	−0.2373	+59	−23
83 Virginis	5.6	2.14	17.3	15 45.4	14 12.1	+10 6.6	+0.0013	0.5454	0.2304	+37	−43
85 Virginis	6.1	2.14	17.2	15 20.7	14 41.8	+10 35.3	−0.5331	0.5458	0.2297	+10	−77
43 H. Virginis	5.5	2.35	17.9	17 48.6	16 3 50.7	− 0 43.5	−0.9037	0.5557	0.2090	−14	−90
231 G. Virginis	6.4	2.36	18.0	18 11.7	4 33.5	− 0 2.2	−0.6588	0.5562	0.2077	0	−90
236 G. Virginis	5.7	+2.37	−18.1	−18 19.7	5 14.4	+ 0 37.3	−0.6656	0.5568	−0.2065	0	−90
9 G. Libræ	6.5	2.50	18.4	20 4.3	12 9.0	+ 7 16.9	−0.2715	0.5622	0.1935	+19	−59
17 G. Libræ	6.4	2.58	18.6	20 49.3	16 54.6	+11 52.0	−0.4075	0.5661	0.1838	+11	−69
18 G. Libræ	6.1	2.60	18.5	20 58.4	17 20.6	−11 42.9	−0.3316	0.5664	0.1829	+15	−63
43 B. Libræ	5.7	2.72	19.4	21 2.3	21 32.6	− 7 40.4	−1.0147	0.5697	0.1738	−25	−90
47 G. Libræ	6.1	+2.76	−18.3	−21 42.4	17 1 15.7	− 4 5.7	−0.9663	0.5727	−0.1653	−23	−90
64 G. Libræ	5.8	2.83	18.1	22 5.4	5 17.4	− 0 13.2	−1.2232	0.5758	0.1558	−45	−88
153 B. Libræ	6.3	2.99	18.2	24 12.4	11 58.3	+ 6 12.1	−0.0632	0.5808	0.1390	+23	−47
42 Libræ	5.0	3.04	17.6	23 32.8	14 47.9	+ 8 55.0	−1.1126	0.5828	0.1315	−37	−90
b Scorpii	4.7	3.15	17.8	25 29.9	18 57.9	−11 4.9	+0.3376	0.5856	0.1202	+43	−25
A Scorpii	4.6	+3.17	−17.5	−25 4.7	19 59.8	−10 5.5	−0.2097	0.5864	−0.1174	+14	−56

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's						At Conjunction in R. A.							Limiting Pa-allels	
Name.		Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.		Hour Angle, H	Y	x'	y'		N.	S.
			s	″	° ′	d	h m	h m					°	°
31 B.	Scorpii	5.4	+3.16	−17.2	−24 17.1	17	20 7.1	− 9 58.5	−1.0265	0.5864	−0.1170		−32	−90
3	Scorpii	5.9	3.17	17.4	24 59.8		20 24.3	− 9 41.9	−0.3398	0.5866	0.1162		+ 7	−65
4	Scorpii	5.7	3.20	17.8	26 1.3		20 43.2	− 9 23.8	+0.6591	0.5868	0.1153		+61	− 6
40 B.	Scorpii	5.4	3.20	17.1	24 35.5		21 56.0	− 8 13.9	−0.9244	0.5876	0.1119		−26	−90
π	Scorpii	3.0	3.22	17.6	25 52.5		22 1.3	− 8 8.9	+0.3638	0.5877	0.1117		+43	−23
48 B.	Scorpii	4.9	+3.25	−17.2	−25 38.0		23 45.8	− 6 28.6	−0.0705	0.5888	−0.1067		+20	−48
50 B.	Scorpii	6.4	3.24	16.8	24 29.8		23 59.8	− 6 15.2	−1.2443	0.5889	0.1061		−53	−81
65 B.	Scorpii	5.5	3.31	17.1	26 6.2	18	1 35.7	− 4 43.1	+0.2142	0.5899	0.1015		+34	−31
85 B.	Scorpii	6.0	3.34	16.4	25 16.0		4 12.3	− 2 12.9	−0.8872	0.5914	0.0938		−25	−90
σ	Scorpii	3.1	3.39	16.0	25 23.7		6 36.5	+ 0 5.4	−0.9747	0.5927	0.0867		−32	−90
α	Scorpii	1.2	+3.47	−15.8	−26 14.9		9 43.3	+ 3 4.5	−0.3668	0.5943	−0.0773		+ 2	−67
116 B.	Scorpii	6.2	3.49	15.7	26 21.5		10 28.1	+ 3 47.5	−0.3135	0.5946	0.0750		+ 5	−63
τ	Scorpii	2.9	3.56	16.0	28 2.7		12 8.8	+ 5 24.1	+1.2683	0.5954	0.0698		+62	−52
134 B.	Scorpii	6.4	3.61	15.1	27 18.1		15 19.6	+ 8 26.9	+0.3112	0.5968	0.0599		+36	−26
118 B.	Ophiuchi	6.2	3.76	13.1	26 24.2		23 48.1	− 7 25.8	−0.9898	0.5995	0.0330		−37	−90
95 G.	Ophiuchi	6.1	+3.83	−13.1	−27 39.7	19	1 50.7	− 5 28.3	+0.2187	0.6000	−0.0264		+29	−31
36	Ophi. (*1st star*)	5.4	3.80	13.1	26 29.0		2 58.3	− 4 23.5	−0.9973	0.6002	0.0228		−39	−90
43	Ophiuchi	5.4	3.92	12.3	28 3.9		5 54.6	− 1 34.6	+0.5446	0.6007	0.0133		+47	−12
163 G.	Ophiuchi	6.3	4.05	10.4	27 50.8		13 19.2	+ 5 31.3	+0.3162	0.6012	−0.0109		+33	−25
X	Sagittarii (*var.*)	4.4	4.08	10.0	27 48.1		14 54.3	+ 7 2.3	+0.2925	0.6012	+0.0161		+31	−27
4 G.	Sagittarii	6.2	+4.06	− 9.6	−26 56.9		15 15.2	+ 7 22.4	−0.5620	0.6011	+0.0172		−13	−63
10 G.	Sagittarii	5.7	4.15	9.1	28 3.3		18 17.8	+10 17.3	+0.6202	0.6009	0.0272		+54	− 8
38 B.	Sagittarii	4.7	4.23	8.2	28 28.2		22 31.9	− 9 39.3	+1.1823	0.6003	0.0408		+62	−36
48 G.	Sagittarii	6.3	4.28	7.3	28 19.1	20	2 0.4	− 6 19.6	+1.1917	0.5995	0.0520		+62	−37
66 B.	Sagittarii	4.7	4.24	6.7	27 4.6		2 16.6	− 6 4.0	−0.0464	0.5995	0.0529		+16	−46
68 G.	Sagittarii	6.2	+4.28	− 5.6	−26 41.3		5 54.7	− 2 35.0	−0.2246	0.5985	+0.0644		+ 8	−57
69 G.	Sagittarii	6.3	4.29	5.6	26 48.6		6 3.0	− 2 27.1	−0.0918	0.5984	0.0648		+15	−40
86 B.	Sagittarii	6.5	4.28	5.5	26 38.3		6 22.2	− 2 8.7	−0.2443	0.5983	0.0658		+ 8	−58
φ	Sagittarii	3.3	4.39	3.8	27 4.8		12 39.9	+ 3 53.4	+0.6772	0.5959	0.0853		+61	− 5
σ	Sagittarii	2.1	4.40	2.6	26 24.2		16 19.8	+ 7 24.3	+0.3290	0.5942	0.0964		+40	−25
162 B.	Sagittarii	6.4	+4.36	− 1.9	−24 59.5		17 31.6	+ 8 33.1	−0.9780	0.5936	+0.1000		−31	−90
127 G.	Sagittarii	6.4	4.38	1.6	25 3.7		18 19.0	+ 9 18.5	−0.8275	0.5932	0.1023		−21	−90
172 B.	Sagittarii	5.8	4.38	1.5	24 57.9		19 6.4	+10 4.0	−0.8430	0.5928	0.1047		−21	−90
189 B.	Sagittarii	6.1	4.40	0.7	24 47.5		21 19.7	−11 48.1	−0.7791	0.5916	0.1111		−17	−90
201 B.	Sagittarii	5.9	4.47	0.5	26 3.0		23 14.0	− 9 58.5	+0.7083	0.5905	0.1166		+64	− 3
ψ	Sagittarii	4.9	+4.45	− 0.1	−25 24.3	21	0 8.1	− 9 6.6	+0.1627	0.5899	+0.1192		+33	−34
208 B.	Sagittarii	6.1	4.42	+ 0.1	24 19.5		0 9.2	− 9 5.5	−0.9243	0.5899	0.1192		−25	−90
χ	Sagittarii	4.9	4.46	1.2	24 40.5		3 55.9	− 5 28.0	−0.1016	0.5876	0.1297		+20	−40
49	Sagittarii	5.5	4.44	1.3	24 7.8		4 1.6	− 5 22.4	−0.6392	0.5876	0.1300		− 7	−90
51	Sagittarii	5.8	4.50	2.3	24 54.3		8 9.0	− 1 24.9	+0.7035	0.5848	0.1411		+65	− 4
h	Sagittarii	4.7	+4.52	+ 2.4	−25 4.3		8 24.8	− 1 9.7	+0.9086	0.5846	+0.1418		+65	− 0
53	Sagittarii	6.3	4.47	3.0	23 37.3		9 40.1	+ 0 2.6	−0.3765	0.5837	0.1451		+ 8	−67
274 B.	Sagittarii	6.1	4.47	3.0	23 37.4		9 47.1	+ 0 9.3	−0.3570	0.5836	0.1454		+ 9	−65
308 B.	Sagittarii	6.3	4.53	4.3	24 9.1		15 26.3	+ 5 35.3	+1.0407	0.5796	0.1597		+66	−19
329 B.	Sagittarii	6.1	4.51	5.6	22 58.2		18 18.9	+ 8 21.2	+0.3147	0.5774	0.1667		+46	−20
336 B.	Sagittarii	6.5	+4.51	+ 5.9	−22 50.0		19 16.1	+ 9 16.2	+0.3358	0.5766	+0.1689		+47	−25
4	Capricorni	5.7	4.51	7.5	22 4.3	22	1 7.4	− 9 5.8	+0.5935	0.5720	0.1822		+63	−11
υ	Capricorni	5.3	4.42	10.5	18 26.1		10 23.2	− 0 10.7	−1.3175	0.5645	0.2012		−51	−78
81 B.	Capricorni	6.4	4.43	11.5	18 20.8		14 21.1	+ 3 38.6	−0.5960	0.5612	0.2086		+ 4	−83
19	Capricorni	5.7	4.44	12.1	18 14.6		16 42.3	+ 5 54.6	−0.2065	0.5593	0.2128		+24	−55
21	Capricorni	6.5	+4.43	+12.8	−17 51.6		19 20.4	+ 8 27.1	−0.0299	0.5571	+0.2173		+34	−45
θ	Capricorni	4.2	4.43	13.3	17 34.1		21 33.7	+10 35.7	+0.1595	0.5554	0.2209		+44	−35
	URANUS	6.0	. . .	. . .	17 35.0		22 17.8	+11 18.2	+0.3382	0.5564	0.2225		+54	−25
114 B.	Capricorni	6.1	4.43	14.2	17 41.6	23	1 36.3	− 9 30.2	+1.1943	0.5520	0.2271		+72	−28
29	Capricorni	5.5	4.37	14.5	15 31.3		1 54.6	− 9 12.6	−0.9525	0.5518	0.2275		−15	−90
42	Capricorni	5.1	+4.34	+16.8	−14 25.3		13 34.8	+ 2 3.6	+0.6709	0.5428	+0.2428		+75	− 8

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

AUGUST.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
Capricorni	6.0	+4.35	+17.1	−14 47.0	23 14 16.3	+ 2 43.7	+1.2101	0.5423	+0.2435	+75	+28
B. Capricorni	6.1	4.30	17.8	13 6.9	17 20.4	+ 5 41.7	+0.2513	0.5401	0.2468	+53	−30
B. Aquarii	6.0	4.20	20.1	9 27.5	24 6 11.6	− 5 52.3	−0.2616	0.5314	0.2580	+28	−58
Aquarii	5.3	4.18	20.4	8 14.6	7 47.5	− 4 19.4	−1.1030	0.5303	0.2591	−19	−90
B. Aquarii	6.0	4.15	20.6	7 37.1	9 24.3	− 2 45.7	−1.3298	0.5294	0.2601	−40	−86
5 B. Aquarii	6.1	+4.14	+21.1	− 6 59.0	13 10.0	+ 0 52.9	−1.0059	0.5272	+0.2623	−12	−90
7 G. Aquarii	6.3	4.16	21.7	8 20.0	16 36.6	+ 4 12.9	+1.2984	0.5252	0.2640	+82	+35
7 Aquarii	6.4	4.13	22.0	7 24.1	19 0.6	+ 6 32.4	+0.9689	0.5239	0.2650	+83	+ 9
2 B. Aquarii	5.8	4.08	22.7	5 26.1	25 0 56.0	−11 43.2	+0.5020	0.5213	0.2669	+73	−18
7 G. Aquarii	6.3	4.08	22.8	5 15.5	1 59.2	−10 42.0	+ .5997	0.5206	0.2672	+79	−12
3 B. Aquarii	6.1	+4.07	+23.0	− 5 9.7	4 6.3	− 8 38.7	+1.0671	0.5196	+0.2676	+85	+15
2 B. Piscium	6.4	3.96	23.8	0 10.1	15 13.4	+ 2 8.2	−1.1704	0.5153	0.2683	−22	−90
3 Piscium	6.4	3.96	24.3	− 1 32.9	19 31.1	+ 6 18.1	+1.4293	0.5139	0.2679	+68	+57
6 Piscium	5.7	3.91	24.1	+ 1 38.2	21 47.7	+ 8 30.7	−1.3090	0.5132	0.2675	−35	−88
λ Piscium	4.6	3.91	24.2	1 19.1	26 0 41.8	+11 19.6	−0.1995	0.5125	0.2669	+33	−54
9 Piscium	5.4	+3.88	+24.3	+ 3 1.3	2 55.6	−10 30.5	−1.4003	0.5120	+0.2664	−48	−76
2 Piscium	5.8	3.88	24.5	2 27.9	5 47.7	− 7 43.5	−0.0509	0.5114	0.2655	+41	−46
5 Piscium	6.2	3.89	24.6	1 37.5	6 22.1	− 7 10.2	+0.9884	0.5112	0.2653	+90	+ 9
1 Piscium	5.6	3.78	24.8	6 29.6	27 2 43.8	−11 24.5	+1.1344	0.5092	0.2544	+90	+21
36 B. Piscium	6.5	3.75	24.4	8 53.9	7 17.9	− 6 58.4	−0.2798	0.5092	0.2510	+29	−57
75 Piscium	6.3	+3.70	+23.7	+12 30.4	20 23.9	+ 5 44.6	−0.9426	0.5102	+0.2393	− 8	−77
η Piscium	3.7	3.65	22.9	14 54.9	28 9 10.7	− 5 51.5	−0.5755	0.5124	0.2251	+13	−70
01 Piscium	6.2	3.64	23.0	14 14.0	11 22.4	− 4 43.7	+0.6534	0.5129	0.2225	+88	− 4
05 Piscium	6.1	3.64	22.5	15 58.9	13 20.7	− 1 49.0	−0.8053	0.5134	0.2200	0	−74
3 Arietis	6.4	3.63	22.1	16 59.6	16 50.7	+ 1 34.8	−1.1436	0.5142	0.2155	−23	−73
4 Arietis	5.8	+3.62	+22.2	+16 32.3	17 39.4	+ 2 22.0	−0.4755	0.5144	+0.2144	+18	−63
ι Arietis	5.1	3.60	21.7	17 24.5	22 16.7	+ 6 50.9	−0.4459	0.5157	0.2081	+20	−60
35 B. Arietis	6.4	3.59	21.4	17 51.1	29 1 28.4	+ 9 56.8	−0.2705	0.5166	0.2035	+29	−50
47 B. Arietis	6.5	3.57	21.4	17 37.9	3 30.4	+11 55.1	+0.3806	0.5172	0.2006	+66	−16
15 Arietis	5.9	3.59	20.9	19 6.3	4 55.1	−10 42.8	−0.9470	0.5177	0.1985	−10	−71
δ Arietis	5.6	+3.56	+20.6	+19 30.9	8 39.2	− 7 5.6	−0.6635	0.5189	+0.1928	+ 8	−70
26 Arietis	6.2	3.54	20.2	19 29.1	14 50.5	− 1 5.7	+0.5316	0.5210	0.1829	+78	− 6
ν Arietis	5.4	3.54	19.2	21 36.0	18 50.3	+ 2 46.7	−1.0693	0.5224	0.1762	−20	−68
ε Arietis (*mean*)	4.6	3.47	18.6	21 0.4	30 4 45.9	−11 36.5	+1.2453	0.5261	0.1586	+86	+45
64 Arietis	5.8	3.45	16.4	24 25.7	16 43.5	− 0 1.9	−0.7599	0.5307	0.1357	0	−66
7 Tauri	5.9	+3.42	+16.0	+24 11.1	21 31.3	+ 4 36.5	+0.1362	0.5325	+0.1260	+51	−20
11 Tauri	6.1	3.41	15.4	25 3.6	31 0 28.9	+ 7 28.5	−0.4657	0.5335	0.1199	+17	−51
16 Tauri	5.4	3.38	15.5	24 1.6	2 23.2	+ 9 19.0	+0.8989	0.5342	0.1159	+90	+22
17 Tauri	3.8	3.38	15.5	23 51.1	2 25.3	+ 9 21.0	+1.0974	0.5342	0.1158	+90	+36
18 Tauri	5.6	3.39	15.3	24 34.7	2 32.7	+ 9 28.2	+0.3093	0.5343	0.1156	+62	−10
q Tauri	4.3	+3.38	+15.4	+24 12.4	2 34.3	+ 9 29.7	+0.7231	0.5343	+0.1155	+90	+12
20 Tauri	4.1	3.38	15.4	24 6.4	2 51.8	+ 9 46.7	+0.8655	0.5344	0.1149	+90	+20
21 Tauri	5.8	3.38	15.3	24 17.7	2 53.9	+ 9 48.7	+0.6631	0.5344	0.1148	+90	+ 9
22 Tauri	6.5	3.38	15.3	24 16.1	2 57.9	+ 9 52.6	+0.6999	0.5344	0.1147	+90	+11
η Tauri	3.0	3.37	15.4	23 50.8	3 38.5	+10 31.8	+1.2415	0.5347	0.1132	+83	+51
28 Tauri	5.2	+3.36	+15.3	+23 52.9	4 26.2	+11 17.9	+1.2925	0.5350	+0.1115	+70	+60
14 H. Tauri	5.3	3.38	14.7	25 19.7	4 56.4	+11 47.1	−0.2486	0.5352	0.1104	+29	−38
p Tauri	5.6	3.33	13.3	26 15.8	14 26.1	− 3 2.0	−0.3322	0.5384	0.0897	+25	−41
φ Tauri	5.0	3.32	12.4	27 9.1	18 47 7	+ 1 10.8	−0.9447	0.5398	0.0708	−13	−63
χ Tauri	5.3	+3.28	+12.9	+25 26.0	19 50 6	+ 2 11.5	+1.0385	0.5401	+0.0774	+90	+36

SEPTEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
17 B. Aurigæ	6.0	+3.22	+10.3	+27 45.5	1 9 32.3	− 8 34.5	−0.6914	0.5437	+0.0454	+ 4	−60
38 B. Aurigæ	6.5	3.17	9.6	27 34.8	14 53.2	− 3 24.7	−0.2857	0.5448	0.0325	+27	−33
47 B. Aurigæ	6.0	+3.16	+ 9.2	+27 55.6	17 10.9	− 1 11.7	−0.5998	0.5453	+0.0270	+ 9	−53

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
354 B. Tauri	6.4	+3.11	+ 8.5	+27 52.5	1 22 14.0	+ 3 41.1	−0.4365	0.5460	+0.0147	+18	−41
β Tauri	1.8	3.11	7.8	28 32.3	2 0 35.8	+ 5 58.0	−1.1428	0.5464	+0.0089	−32	−61
107 B. Aurigæ	6.5	3.05	7.5	27 36.6	4 55.9	+10 9.2	−0.1006	0.5468	−0.0018	+37	−20
112 B. Aurigæ	5.7	3.03	7.7	26 52.4	5 29.3	+10 41.4	+0.7103	0.5469	0.0031	+90	+23
406 B. Tauri	5.6	3.00	6.5	27 56.7	11 39.1	− 7 21.6	−0.5381	0.5472	0.0183	+12	−48
136 Tauri	4.6	+2.98	+ 6.4	+27 35.7	12 42.8	− 6 20.0	−0.1724	0.5473	−0.0209	+33	−25
415 B. Tauri	6.1	2.95	6.0	27 34.2	16 8.9	− 3 1.0	−0.2319	0.5473	0.0294	+30	−38
37 Geminorum	5.7	2.68	3.0	25 29.0	3 16 33.5	− 3 26.9	+0.6162	0.5454	0.0884	+89	+ 9
39 Geminorum	6.2	2.67	2.6	26 11.7	18 7.4	− 1 56.2	−0.3034	0.5450	0.0921	+26	−39
40 Geminorum	6.3	2.67	2.6	26 1.9	18 25.5	− 1 38.8	−0.1525	0.5450	0.0928	+35	−31
48 Geminorum	5.8	+2.58	+ 2.2	+24 16.3	4 0 20.2	+ 4 3.9	+1.1813	0.5438	−0.1064	+90	+45
52 Geminorum	6.1	2.59	1.8	25 2.0	1 20.9	+ 5 2.5	+0.2399	0.5436	0.1087	+58	−13
A Geminorum	5.1	2.55	1.2	25 12.9	5 21.0	+ 8 54.5	−0.4106	0.5427	0.1177	+21	−48
176 B. Geminorum	6.3	2.48	0.4	24 33.1	12 7.3	− 8 32.9	−0.5342	0.5410	0.1326	+14	−57
181 B. Geminorum	6.0	2.48	0.4	24 25.0	12 34.0	− 8 7.1	−0.4457	0.5410	0.1335	+19	−51
187 B. Geminorum	6.3	+2.44	+ 0.6	+23 13.0	13 24.2	− 7 18.6	+0.7463	0.5407	−0.1353	+90	+11
192 B. Geminorum	6.3	2.42	0.7	22 36.1	14 31.0	− 6 14.0	+1.2631	0.5404	0.1377	+82	−51
κ Geminorum	3.7	2.46	0.0	24 36.2	14 58.9	− 5 47.1	−0.9770	0.5403	0.1387	−14	−65
82 Geminorum	6.3	2.42	+ 0.1	23 21.1	16 53.9	− 3 55.9	+0.1120	0.5398	0.1428	+50	−23
5 B. Cancri	6.4	2.38	− 0.8	23 49.0	22 40.0	+ 1 38.6	−1.2489	0.5382	0.1547	−40	−66
9 Cancri	6.2	+2.34	− 0.9	+22 52.7	5 1 8.8	+ 4 2.6	−0.6211	0.5374	−0.1596	+ 9	−65
μ Cancri	5.5	2.32	0.8	21 49.7	1 50.5	+ 4 42.9	+0.4033	0.5372	0.1610	+68	−10
49 B. Cancri	6.0	2.26	1.4	21 1.0	7 45.0	+10 25.8	+0.2954	0.5355	0.1724	+61	−17
η Cancri	5.5	2.20	2.0	20 43.8	13 35.6	− 7 55.1	−0.4354	0.5337	0.1833	+20	−57
39 Cancri	6.5	2.17	2.4	20 18.5	17 6.6	− 4 31.0	−0.6362	0.5326	0.1895	+ 9	−68
40 Cancri	6.5	+2.17	− 2.4	+20 16.3	17 9.1	− 4 28.5	−0.6049	0.5326	−0.1896	+11	−68
102 B. Cancri	6.5	2.16	2.3	19 58.2	17 14.3	− 4 23.5	−0.2979	0.5326	0.1897	+27	−50
ε Cancri	6.3	2.16	2.3	19 50.7	17 16.8	− 4 21.1	−0.1715	0.5327	0.1898	+34	−43
δ Cancri	4.2	2.12	2.4	18 28.0	19 18.9	− 2 22.9	+0.9193	0.5320	0.1933	+90	+15
139 B. Cancri	6.1	2.12	2.8	19 9.0	22 12.2	+ 0 24.7	−0.3792	0.5311	0.1982	+23	−55
X Cancri (*var.*)	6.2	+2.08	− 2.7	+17 33.3	6 0 26.6	+ 2 34.9	+0.8815	0.5305	−0.2019	+90	+12
π Cancri	5.6	1.98	3.5	15 17.6	10 2.8	+11 52.6	+1.2803	0.5278	0.2168	+87	+41
227 B. Cancri	6.4	1.97	3.9	+15 43.9	12 58.2	− 9 17.5	+0.1734	0.5271	0.2210	+53	−29
				NEW	*MOON.*						
370 B. Virginis	6.0	+1.68	−13.6	−11 11.5	10 21 24.4	− 4 7.4	+1.0482	0.5379	−0.2584	+79	+15
ψ Virginis	5.0	1.70	13.3	9 4.9	21 25.6	− 4 6.3	−1.1091	0.5379	0.2584	−21	−90
75 Virginis	5.6	1.82	15.1	14 55.8	11 14 59.5	−11 7.8	+0.4592	0.5484	0.2395	+64	−19
83 Virginis	5.6	1.88	15.4	15 45.4	20 9.3	− 6 8.8	+0.0786	0.5518	0.2324	+41	−39
85 Virginis	6.1	1.88	15.4	15 20.7	20 38.5	− 5 40.6	−0.4513	0.5521	0.2317	+14	−71
43 H. Virginis	5.5	+2.03	−16.1	−17 48.5	12 9 33.6	+ 6 47.0	−0.8140	0.5611	−0.2105	− 8	−90
231 G. Virginis	6.4	2.04	16.1	18 11.7	10 15.8	+ 7 27.6	−0.5704	0.5617	0.2092	+ 6	−81
236 G. Virginis	5.7	2.05	16.2	18 19.6	10 56.0	+ 8 6.3	−0.5770	0.5622	0.2080	+ 5	−81
9 G. Libræ	6.5	2.15	16.6	20 4.3	17 44.6	− 9 20.1	−0.1829	0.5670	0.1947	+23	−54
17 G. Libræ	6.4	2.22	16.7	20 49.2	22 26.6	− 4 48.6	−0.3168	0.5704	0.1848	+16	−62
18 G. Libræ	6.1	+2.23	−16.7	−20 58.4	22 52.3	− 4 23.8	−0.2411	0.5707	−0.1838	+20	−57
43 B. Libræ	5.7	2.35	17.8	21 2.3	13 3 1.5	− 0 24.1	−0.9201	0.5736	0.1746	−19	−90
47 G. Libræ	6.1	2.37	16.7	21 42.4	6 42.4	+ 3 8.3	−0.8712	0.5761	0.1659	−17	−90
64 G. Libræ	5.8	2.43	16.5	22 5.4	10 42.1	+ 6 58.8	−1.1269	0.5788	0.1562	−36	−90
153 B. Libræ	6.3	2.57	16.7	24 12.4	17 20.3	−10 38.7	+0.0308	0.5830	0.1392	+28	−42
42 Libræ	5.0	+2.62	−16.3	−23 32.8	20 9.1	− 7 56.5	−1.0162	0.5846	−0.1317	−30	−90
b Scorpii	4.7	2.72	16.5	25 29.9	14 0 18.3	− 3 57.1	+0.4323	0.5869	0.1202	+49	−19
A Scorpii	4.6	2.73	16.3	25 4.7	1 20.1	− 2 57.9	−0.1142	0.5875	0.1174	+19	−50
31 B. Scorpii	5.4	2.72	16.0	24 17.1	1 27.4	− 2 50.9	−0.9302	0.5876	0.1170	−35	−90
3 Scorpii	5.9	2.74	16.2	24 59.8	1 44.5	− 2 34.4	−0.2442	0.5876	0.1162	+13	−58
4 Scorpii	5.7	+2.76	−16.5	−26 1.2	2 3.4	− 2 16.3	+0.7539	0.5879	−0.1154	+64	0

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.		Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d	h m	h m				°	°
B. Scorpii	5.4	+2.76	−15.9	−24 35.5	14	3 16.0	− 1 6.6	−0.8282	0.5885	−0.1119	−19	−90
Scorpii	3.0	2.78	16.4	25 52.5		3 21.3	− 1 1.5	+0.4591	0.5885	0.1117	+50	−18
3 B. Scorpii	4.9	2.81	16.0	25 38.0		5 5.8	+ 0 38.7	+0.0252	0.5894	0.1067	+25	−42
B. Scorpii	6.4	2.80	15.6	24 29.8		5 19.7	+ 0 52.1	−1.1481	0.5895	0.1060	−43	−90
5 B. Scorpii	5.5	2.86	16.0	26 6.2		6 55.6	+ 2 24.1	+0.3101	0.5902	0.1014	+40	−26
5 B. Scorpii	6.0	+2.89	−15.4	−25 16.0		9 32.3	+ 4 54.5	−0.7912	0.5915	−0.0937	−19	−90
5 Scorpii	3.1	2.94	15.2	25 23.6		11 56.8	+ 7 13.1	−0.8790	0.5924	0.0865	−25	−90
Scorpii	1.2	3.02	15.0	26 14.9		15 4.0	+10 12.7	−0.2707	0.5936	0.0771	+ 7	−60
6 B. Scorpii	6.2	3.04	14.9	26 21.5		15 49.0	+10 55.8	−0.2173	0.5938	0.0748	+10	−56
4 B. Scorpii	6.4	3.16	14.5	27 18.1		20 41.8	− 8 23.5	+0.4086	0.5953	0.0597	+42	−20
8 B. Ophiuchi	6.2	+3.31	−12.8	−26 24.2	15	5 13.9	− 0 12.6	−0.8966	0.5969	−0.0329	−31	−90
5 G. Ophiuchi	6.1	3.38	12.8	27 39.7		7 17.6	+ 1 45.9	+0.3161	0.5971	0.0264	+34	−25
6 Ophi. (*1st star*)	5.4	3.35	13.0	26 29.0		8 25.9	+ 2 51.4	−0.9048	0.5972	0.0227	−32	−90
3 Ophiuchi	5.4	3.47	12.2	28 3.9		11 24.0	+ 5 42.1	+0.6433	0.5973	0.0132	+55	− 6
51 G. Ophiuchi	6.0	3.49	10.9	26 12.5		14 34.8	+ 8 45.0	−1.2626	0.5972	−0.0031	−63	−72
63 G. Ophiuchi	6.3	+3.61	−10.5	−27 50.8		18 54.1	−11 6.5	+0.4133	0.5969	+0.0107	+39	−20
X Sagittarii (*var.*)	4.4	3.64	10.2	27 48.1		20 30.5	− 9 34.1	+0.3894	0.5967	0.0158	+37	−21
4 G. Sagittarii	6.2	3.63	9.8	26 56.9		20 51.7	− 9 13.8	−0.4701	0.5966	0.0169	− 8	−75
10 G. Sagittarii	5.7	3.72	9.5	28 3.3		23 57.0	− 6 16.2	+0.7188	0.5961	0.0267	+62	− 2
66 B. Sagittarii	4.7	3.83	7.2	27 4.6	16	8 3.7	+ 1 30.5	+0.0464	0.5939	0.0521	+21	−41
68 G. Sagittarii	6.2	+3.88	− 6.2	−26 41.3		11 45.7	+ 5 3.4	−0.1342	0.5925	+0.0634	+13	−51
69 G. Sagittarii	6.3	3.89	6.2	26 48.6		11 54.2	+ 5 11.6	−0.0003	0.5924	0.0638	+20	−43
86 B. Sagittarii	6.5	3.89	6.1	26 38.3		12 13.8	+ 5 30.4	−0.1542	0.5923	0.0648	+12	−52
126 B. Sagittarii	5.7	3.94	4.0	25 5.9		18 21.6	+11 23.2	−1.2655	0.5895	0.0832	−58	−75
φ Sagittarii	3.3	4.01	4.6	27 4.8		18 38.9	+11 39.9	+0.7732	0.5894	0.0840	+63	+ 1
σ Sagittarii	2.1	+4.05	− 3.5	−26 24.3		22 23.4	− 8 44.7	+0.4209	0.5875	+0.0949	+46	−20
162 B. Sagittarii	6.4	4.02	2.7	24 59.5		23 36.7	− 7 34.3	−0.8980	0.5868	0.0984	−25	−90
127 G. Sagittarii	6.4	4.03	2.4	25 3.7	17	0 25.1	− 6 47.9	−0.7465	0.5864	0.1007	−15	−90
172 B. Sagittarii	5.8	4.04	2.4	24 57.9		1 13.5	− 6 1.4	−0.7625	0.5859	0.1030	−16	−90
189 B. Sagittarii	6.1	4.07	1.6	24 47.5		3 29.7	− 3 50.6	−0.6991	0.5846	0.1093	−12	−90
201 B. Sagittarii	5.9	+4.14	− 1.5	−26 3.0		5 26.5	− 1 58.5	+0.8014	0.5834	+0.1147	+64	+ 3
ψ Sagittarii	4.9	4.13	1.1	25 24.3		6 21.9	− 1 5.3	+0.2503	0.5828	0.1172	+38	−29
208 B. Sagittarii	6.1	4.10	− 0.7	24 19.5		6 23.0	− 1 4.2	−0.8470	0.5828	0.1172	−20	−90
χ Sagittarii	4.9	4.16	+ 0.2	24 40.5		10 14.9	+ 2 38.6	−0.0181	0.5803	0.1276	+25	−44
49 Sagittarii	5.5	4.14	0.4	24 7.8		10 20.8	+ 2 44.3	−0.5610	0.5802	0.1278	− 3	−82
51 Sagittarii	5.8	+4.22	+ 1.3	−24 54.3		14 34.0	+ 6 47.7	+0.7929	0.5773	+0.1387	+65	+ 2
h Sagittarii	4.7	4.23	1.2	25 4.3		14 50.1	+ 7 3.1	+1.0000	0.5772	0.1394	+65	+16
53 Sagittarii	6.3	4.19	2.0	23 37.3		16 7.3	+ 8 17.3	−0.2986	0.5762	0.1426	+12	−61
274 B. Sagittarii	6.1	4.20	2.1	23 37.4		16 14.4	+ 8 24.2	−0.2790	0.5762	0.1429	+13	−60
308 B. Sagittarii	6.3	4.27	3.1	24 9.2		22 1.8	−10 1.7	+1.1301	0.5720	0.1570	+66	+26
329 B. Sagittarii	6.1	+4.27	+ 4.5	−22 58.2	18	0 58.6	− 7 11.5	+0.3948	0.5698	+0.1638	+51	−22
336 B. Sagittarii	6.5	4.27	4.9	22 50.0		1 57.2	− 6 15.2	+0.4156	0.5690	0.1660	+53	−20
4 Capricorni	5.7	4.31	6.5	22 4.3		7 57.2	− 0 28.5	+0.6722	0.5645	0.1790	+67	− 6
υ Capricorni	5.3	4.27	9.8	18 26.1		17 26.8	+ 8 40.5	−1.2660	0.5571	0.1978	−44	−86
81 B. Capricorni	6.4	4.30	10.8	18 20.8		21 30.5	−11 24.5	−0.5398	0.5540	0.2051	+ 7	−78
19 Capricorni	5.7	+4.31	+11.4	−18 14.6		23 55.1	− 9 5.0	−0.1481	0.5522	+0.2092	+27	−52
21 Capricorni	6.5	4.32	12.1	17 51.6	19	2 37.0	− 6 28.7	+0.0280	0.5502	0.2136	+37	−42
URANUS	6.0	. . .	. . .	17 49.5		4 3.2	− 5 5.4	+0.3018	0.5502	0.2162	+51	−27
θ Capricorni	4.2	4.32	12.7	17 34.1		4 53.4	− 4 16.9	+0.2175	0.5484	0.2172	+47	−32
114 B. Capricorni	6.1	4.35	13.6	17 41.6		9 1.8	− 0 17.0	+1.2595	0.5454	0.2233	+72	+35
29 Capricorni	5.5	+4.29	+14.1	−15 31.3		9 20.4	+ 0 0.9	−0.9101	0.5452	+0.2238	−12	−90
42 Capricorni	5.1	4.32	16.6	14 25.4		21 16.1	+11 32.7	+0.7181	0.5369	0.2390	+76	− 5
44 Capricorni	6.0	4.34	16.9	14 47.0		21 58.5	−11 46.3	+1.2620	0.5365	0.2398	+75	+33
151 B. Capricorni	6.1	4.30	17.8	13 6.9	20	1 6.4	− 8 44.6	+0.2902	0.5344	0.2432	+55	−28
150 B. Aquarii	6.0	4.26	20.6	9 27.5		14 12.2	+ 3 56.0	−0.2424	0.5268	0.2546	+29	−57
ρ Aquarii	5.3	+4.24	+21.1	− 8 14.6		15 49.8	+ 5 30.6	−1.0929	0.5229	+0.2557	−19	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.						Limiting Parallels	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.		Hour Angle, H	Y	x′	y′	N.	S
		s	″	° ′	d	h m	h m				°	°
170 B. Aquarii	6.0	+4.23	+21.5	− 7 37.1	20	17 28.2	+ 5 5.9	−1.3233	0.5251	+0.2568	−40	[illegible]
186 B. Aquarii	6.1	4.23	22.0	6 59.0		21 17.5	+10 48.1	−1.0012	0.5232	0.2591	−12	[illegible]
167 G. Aquarii	6.3	4.27	22.4	8 20.0	21	0 47.3	− 9 48.6	+1.3169	0.5216	0.2609	+81	+37
67 Aquarii	6.4	4.26	22.9	7 24.1		3 13.4	− 7 27.0	+0.9816	0.5206	0.2620	+83	[illegible]
252 B. Aquarii	5.8	4.23	23.9	5 26.0		9 13.5	− 1 37.8	+0.5032	0.5182	0.2642	+73	[illegible]
197 G. Aquarii	6.3	+4.23	+24.0	− 5 15.5		10 17.4	− 0 35.9	+0.6001	0.5178	+0.2644	+80	[illegible]
263 B. Aquarii	6.1	4.24	24.3	5 9.7		12 26.0	+ 1 28.8	+1.0676	0.5171	0.2650	+85	+15
22 B. Piscium	6.4	4.18	25.8	0 10.1		23 39.6	−11 37.7	−1.1983	0.5138	0.2662	−24	[illegible]
13 Piscium	6.4	4.21	26.2	− 1 32.9	22	3 59.3	− 7 25.8	+1.4088	0.5128	0.2660	+75	[illegible]
16 Piscium	5.7	4.17	26.5	+ 1 38.3		6 16.8	− 5 12.4	−1.3455	0.5124	0.2657	−40	[illegible]
λ Piscium	4.6	+4.18	+26.6	+ 1 19.2		9 12.0	− 2 22.4	−0.2349	0.5119	+0.2653	+31	[illegible]
22 Piscium	5.8	4.18	27.0	2 27.9		14 19.3	+ 2 35.9	−0.0927	0.5112	0.2641	+38	[illegible]
25 Piscium	6.2	4.19	27.0	1 37.5		14 53.9	+ 3 9.4	+0.9498	0.5111	0.2638	+90	[illegible]
51 Piscium	5.6	4.18	27.9	6 29.6	23	11 17.4	− 1 2.9	+1.0669	0.5107	0.2538	+90	[illegible]
136 B. Piscium	6.5	4.17	27.8	8 53.9		15 51.0	+ 3 22.6	−0.3557	0.5116	0.2506	+25	[illegible]
75 Piscium	6.3	+4.18	+27.5	+12 30.5	24	4 54.4	− 7 57.2	−1.0346	0.5128	+0.2392	+13	[illegible]
η Piscium	3.7	4.19	26.8	14 54.9		17 37.1	+ 4 22.8	−0.6817	0.5155	0.2254	+ 7	[illegible]
101 Piscium	6.2	4.19	26.8	14 14.1		19 48.1	+ 6 29.9	+0.5441	0.5160	0.2227	+78	[illegible]
105 Piscium	6.1	4.20	26.5	15 58.9		21 45.6	+ 8 23.8	−0.9158	0.5166	0.2202	− 7	[illegible]
3 Arietis	6.4	4.21	26.1	16 59.7	25	1 14.2	+11 46.1	−1.2573	0.5176	0.2158	−35	[illegible]
4 Arietis	5.8	+4.20	+26.1	+16 32.4		2 2.5	−11 27.1	−0.5906	0.5178	+0.2147	+12	[illegible]
ι Arietis	5.1	4.21	25.7	17 24.6		6 38.0	− 7 0.0	−0.5657	0.5191	0.2084	+13	[illegible]
35 B. Arietis	6.4	4.21	25.4	17 51.1		9 48.2	− 3 55.6	−0.3936	0.5201	0.2038	+22	[illegible]
47 B. Arietis	6.5	4.20	25.3	17 37.9		11 49.4	− 1 58.2	+0.2448	0.5207	0.2009	+58	[illegible]
20 H¹. Arietis	6.4	4.20	25.3	16 50.0		12 37.6	− 1 11.4	+1.2866	0.5210	0.1997	+85	+45
15 Arietis	5.9	+4.22	+24.9	+19 6.4		13 13.4	− 0 36.7	−1.0724	0.5212	+0.1988	−19	[illegible]
θ Arietis	5.6	4.22	24.5	19 30.9		16 56.0	+ 2 59.0	−0.7927	0.5224	0.1931	[illegible]	[illegible]
26 Arietis	6.2	4.22	24.0	19 29.1		23 4.5	+ 8 56.1	+0.3953	0.5245	0.1831	+67	[illegible]
ν Arietis	5.4	4.24	23.1	21 36.0	26	3 2.6	−11 13.3	−1.2065	0.5259	0.1764	−33	[illegible]
μ Arietis	5.7	4.21	23.4	19 39.4		4 47.3	− 9 31.8	+1.2280	0.5265	0.1734	+90	[illegible]
ε Arietis (*mean*)	4.6	+4.21	+22.2	+21 0.4		12 54.0	− 1 40.6	+1.0971	0.5294	+0.1587	+90	[illegible]
64 Arietis	5.8	4.24	19.7	24 25.8	27	0 47.3	+ 9 49.7	−0.9134	0.5335	0.1357	−10	[illegible]
7 Tauri	5.9	4.23	19.1	24 11.1		5 33.6	− 9 33.4	−0.0211	0.5351	0.1259	+42	[illegible]
11 Tauri	6.1	4.24	18.4	25 3.6		8 30.5	− 6 42.3	−0.6241	0.5360	0.1197	+ 8	[illegible]
16 Tauri	5.4	4.21	18.4	24 1.7		10 24.2	− 4 52.3	+0.7383	0.5366	0.1157	+90	[illegible]
17 Tauri	3.8	+4.20	+18.5	+23 51.1		10 26.4	− 4 50.2	+0.9367	0.5366	+0.1157	+90	[illegible]
18 Tauri	5.6	4.22	18.2	24 34.7		10 33.8	− 4 43.1	+0.1491	0.5366	0.1154	+52	[illegible]
q Tauri	4.3	4.21	18.3	24 12.4		10 35.4	− 4 41.5	+0.5626	0.5367	0.1153	+82	[illegible]
20 Tauri	4.1	4.21	18.3	24 6.5		10 52.8	− 4 24.6	+0.7047	0.5367	0.1147	+90	[illegible]
21 Tauri	5.8	4.21	18.3	24 17.7		10 54.9	− 4 22.6	+0.5024	0.5367	0.1146	+77	[illegible]
22 Tauri	6.5	+4.21	+18.3	+24 16.1		10 58.8	− 4 18.8	+0.5391	0.5368	+0.1145	+80	[illegible]
23 Tauri	4.3	4.20	18.4	23 41.4		11 7.1	− 4 10.8	+1.1941	0.5368	0.1142	+90	[illegible]
η Tauri	3.0	4.20	18.3	23 50.9		11 39.3	− 3 39.7	+1.0800	0.5370	0.1131	+90	[illegible]
27 Tauri	3.7	4.19	18.2	23 48.0		12 26.2	− 2 54.4	+1.2217	0.5372	0.1114	+86	[illegible]
28 Tauri	5.2	4.20	18.2	23 53.0		12 26.8	− 2 53.8	+1.1306	0.5372	0.1114	+90	[illegible]
14 H. Tauri	5.3	+4.23	+17.6	+25 19.7		12 56.9	− 2 24.7	−0.4097	0.5374	+0.1103	+20	[illegible]
p Tauri	5.6	4.20	15.8	26 15.9		22 25.0	+ 6 44.6	−0.4978	0.5400	0.0894	+15	[illegible]
φ Tauri	5.0	4.21	14.7	27 9.1	28	2 46.2	+10 57.1	−1.1121	0.5411	0.0795	−27	[illegible]
χ Tauri	5.3	4.16	15.2	25 26.0		3 49.1	+11 57.8	+0.8707	0.5413	0.0771	+90	[illegible]
17 B. Aurigæ	6.0	4.14	11.9	27 45.6		17 31.0	+ 1 12.0	−0.8645	0.5440	0.0451	− 8	[illegible]
38 B. Aurigæ	6.5	+4.09	+10.9	+27 34.9		22 52.7	+ 6 22.7	−0.4598	0.5447	+0.0322	+17	[illegible]
47 B. Aurigæ	6.0	4.08	10.4	27 55.6	29	1 10.9	+ 8 36.1	−0.7750	0.5449	0.0267	− 2	[illegible]
354 B. Tauri	6.4	4.04	9.4	27 52.5		6 15.2	−10 30.0	−0.6126	0.5453	+0.0144	+ 8	[illegible]
107 B. Aurigæ	6.5	3.98	8.1	27 36.6		12 59.1	− 4 0.0	−0.2772	0.5455	−0.0019	+27	[illegible]
112 B. Aurigæ	5.7	3.96	8.3	26 52.5		13 32.8	− 3 27.4	+0.5354	0.5455	0.0033	+81	[illegible]
406 B. Tauri	5.6	+3.93	+ 6.7	+27 56.7		19 45.0	+ 2 32.0	−0.7164	0.5454	−0.0183	+ 2	−62

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

SEPTEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	Y	x′	y′	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
6 Tauri	4.6	+3.91	+ 6.6	+27 35.7	**29** 20 49.2	+ 3 34.0	-0.3499	0.5454	-0.0209	+23	-36
5 B. Tauri	6.1	3.88	5.9	27 34.2	**30** 0 16.9	+ 6 54.7	-0.4097	0.5452	0.0293	+20	-41
ε Geminorum	3.2	+3.60	+ 2.9	+25 13.0	19 45.3	+ 1 43.2	+1.1611	0.5427	-0.0756	+90	+46
OCTOBER.											
37 Geminorum	5.7	+3.55	+ 1.8	+25 29.0	**1** 0 56.5	+ 6 44.0	+0.4437	0.5416	-0.0876	+72	0
39 Geminorum	6.2	3.55	1.3	26 11.6	2 31.6	+ 8 15.8	-0.4792	0.5413	0.0912	+16	-49
40 Geminorum	6.3	3.55	1.2	26 1.8	2 49.9	+ 8 33.5	-0.3276	0.5412	0.0918	+25	-41
48 Geminorum	5.8	3.43	0.7	24 16.3	8 49.1	- 9 39.4	+1.0132	0.5398	0.1052	+90	+32
52 Geminorum	6.1	+3.45	+ 0.2	+25 2.0	9 50.6	- 8 40.0	+0.0684	0.5396	-0.1075	+47	-21
A Geminorum	5.1	3.40	- 0.6	25 12.9	13 53.9	- 4 44.8	-0.5836	0.5386	0.1164	+11	-58
B. D.+23° 1744	6.4	3.29	0.6	23 4.2	18 16.6	- 0 30.8	+1.2338	0.5374	0.1257	+85	+48
176 B. Geminorum	6.3	3.31	1.6	24 33.1	20 45.7	+ 1 53.3	-0.7051	0.5367	0.1310	+ 4	-65
181 B. Geminorum	6.0	3.30	1.7	24 24.9	21 12.7	+ 2 19.5	-0.6160	0.5366	0.1319	+ 9	-61
187 B. Geminorum	6.3	+3.25	- 1.4	+23 13.0	22 3.7	+ 3 8.8	+0.5816	0.5363	-0.1337	+84	+ 2
192 B. Geminorum	6.3	3.23	1.4	22 36.0	23 11.4	+ 4 14.2	+1.1012	0.5360	0.1360	+90	+35
κ Geminorum	3.7	3.27	2.2	24 36.1	23 39.7	+ 4 41.6	-1.1484	0.5359	0.1370	-29	-65
82 Geminorum	6.3	3.22	2.1	23 21.1	**2** 1 36.3	+ 6 34.4	-0.0538	0.5353	0.1410	+40	-31
Mars	1.1	. . .	. . .	21 38.2	8 32.6	-10 43.0	+0.7885	0.5090	0.1509	+90	+11
9 Cancri	6.2	+3.11	- 3.4	+22 52.7	9 58.0	- 9 20.4	-0.7854	0.5329	-0.1576	- 1	-67
μ Cancri	5.5	3.08	3.2	21 49.7	10 40.4	- 8 39.3	+0.2438	0.5327	0.1589	+58	-18
49 B. Cancri	6.0	2.99	3.9	21 0.9	16 39.7	- 2 51.7	+0.1396	0.5310	0.1702	+51	-24
η Cancri	5.5	2.91	4.7	20 43.8	22 35.0	+ 2 52.2	-0.5898	0.5293	0.1809	+11	-65
39 Cancri	6.5	2.87	5.1	20 18.4	**3** 2 8.8	+ 6 19.2	-0.7884	0.5284	0.1871	0	-70
40 Cancri	6.5	+2.87	- 5.1	+20 16.2	2 11.3	+ 6 21.6	-0.7569	0.5283	-0.1871	+ 2	-70
102 B. Cancri	6.5	2.86	5.0	19 58.2	2 16.6	+ 6 26.8	-0.4488	0.5283	0.1873	+19	-58
ε Cancri	6.3	2.86	5.0	19 50.7	2 19.1	+ 6 29.2	-0.3218	0.5283	0.1874	+26	-50
δ Cancri	4.2	2.80	5.1	18 28.0	4 22.7	+ 8 28.8	+0.7750	0.5278	0.1908	+90	+ 7
139 B. Cancri	6.1	2.79	5.6	19 8.9	7 18.3	+11 18.8	-0.5258	0.5270	0.1957	+15	-63
X Cancri (*var.*)	6.2	+2.73	- 5.4	+17 33.2	9 34.2	-10 29.5	+0.7415	0.5264	-0.1993	+90	+ 4
π Cancri	5.6	2.59	6.2	15 17.6	19 17.0	- 1 5.1	+1.1509	0.5242	0.2141	+90	+29
227 B. Cancri	6.4	2.57	6.7	15 43.8	22 14.1	+ 1 46.5	+0.0442	0.5236	0.2183	+46	-34
7 Leonis	6.2	2.48	7.4	14 45.4	**4** 5 27.0	+ 8 45.8	-0.5290	0.5224	0.2280	+15	-68
11 Leonis	6.5	2.47	7.6	14 43.8	6 30.5	+ 9 47.4	-0.7415	0.5222	0.2294	+ 4	-75
ψ Leonis	5.6	+2.44	- 7.8	+14 24.5	9 19.9	-11 28.5	-1.0520	0.5218	-0.2329	-16	-76
18 Leonis	5.8	2.39	7.4	12 12.0	10 40.3	-10 10.6	+0.9771	0.5216	0.2345	+90	+13
19 Leonis	6.4	2.38	7.4	11 57.6	11 11.5	- 9 40.4	+1.1092	0.5216	0.2351	+90	+23
R Leonis (*var.*)	5–10	2.38	7.4	11 49.3	11 15.2	- 9 36.8	+1.2410	0.5216	0.2352	+90	+34
ν Leonis	5.0	2.35	8.3	12 50.9	16 32.1	- 4 29.7	-1.1039	0.5210	0.2412	-19	-77
A Leonis	4.6	+2.26	- 8.3	+10 24.7	21 22.4	+ 0 11.7	+0.2870	0.5207	-0.2463	+59	-26
44 Leonis	5.9	2.18	9.0	9 12.9	**5** 6 0.9	+ 8 34.3	-0.6188	0.5206	0.2543	+11	-78
48 Leonis	5.2	2.12	9.1	7 23.3	10 47.1	-10 48.3	+0.0696	0.5208	0.2582	+47	-38
35 Sextantis	6.1	2.06	9.2	5 11.5	15 2.7	- 6 40.6	+1.2543	0.5211	0.2613	+90	+31
37 Sextantis	6.3	2.08	9.7	6 49.1	16 24.2	- 5 21.6	-0.7963	0.5212	0.2622	+ 2	-83
d Leonis	5.0	+2.00	- 9.9	+ 4 4.3	23 35.7	+ 1 36.6	+0.1589	0.5222	-0.2664	+52	-34
p^4 Leonis	5.7	1.95	10.0	+ 2 24.9	**6** 2 45.5	+ 4 40.5	+1.0292	0.5228	0.2678	+90	+12
				NEW	*MOON.*						
17 G. Libræ	6.4	+2.01	-15.1	-20 49.2	**10** 5 46.6	+ 4 19.1	-0.1777	0.5800	-0.1863	+22	-53
18 G. Libræ	6.1	+2.02	-15.0	-20 58.3	6 11.5	+ 4 43.0	-0.1026	0.5803	-0.1854	+26	-49
43 B. Libræ	5.7	2.12	16.3	21 2.3	10 13.6	+ 8 35.7	-0.7669	0.5833	0.1760	-10	-90
47 G. Libræ	6.1	2.12	15.0	21 42.4	13 48.1	-11 58.3	-0.7141	0.5858	0.1673	- 8	-90
64 G. Libræ	5.8	2.16	14.8	22 5.4	17 41.0	- 8 14.7	-0.9615	0.5884	0.1574	-23	-90
153 B. Libræ	6.3	2.26	14.9	24 12.3	**11** 0 8.2	- 2 3.2	+0.1885	0.5924	0.1401	+36	-33
42 Libræ	5.0	+2.30	-14.6	-23 32.8	2 52.4	+ 0 34.3	-0.8421	0.5940	-0.1325	-19	-90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d h m	h m				°	°
b Scorpii	4.7	+2.37	−14.8	−25 29.9	11 6 54.9	+ 4 26.9	+0.5924	0.5962	−0.1209	+58	−10
A Scorpii	4.6	2.39	14.6	25 4.7	7 55.0	+ 5 24.6	+0.0538	0.5966	0.1180	+27	−40
31 B. Scorpii	5.4	2.38	14.4	24 17.1	8 2.1	+ 5 31.3	−0.7519	0.5967	0.1177	−15	−90
3 Scorpii	5.9	2.39	14.5	24 59.8	8 18.8	+ 5 47.4	−0.0742	0.5968	0.1169	+20	−47
4 Scorpii	5.7	2.41	14.7	26 1.2	8 37.2	+ 6 5.0	+0.9118	0.5970	0.1160	+64	+10
40 B. Scorpii	5.4	+2.41	−14.3	−24 35.4	9 48.0	+ 7 12.9	−0.6495	0.5975	−0.1125	−10	−90
π Scorpii	3.0	2.43	14.6	25 52.5	9 53.1	+ 7 17.8	+0.6220	0.5976	0.1122	+60	− 8
48 B. Scorpii	4.9	2.45	14.4	25 38.0	11 34.9	+ 8 55.4	+0.1952	0.5983	0.1071	+34	−32
50 B. Scorpii	6.4	2.44	14.1	24 29.8	11 48.5	+ 9 8.4	−0.9636	0.5984	0.1065	−29	−90
65 B. Scorpii	5.5	2.49	14.3	26 6.2	13 21.9	+10 37.9	+0.4785	0.5991	0.1018	+50	−16
85 B. Scorpii	6.0	+2.52	−13.8	−25 15.9	15 54.8	−10 55.6	−0.6075	0.6001	−0.0940	− 9	−88
σ Scorpii	3.1	2.56	13.7	25 23.6	18 15.7	− 8 40.6	−0.6922	0.6008	0.0867	−15	−90
α Scorpii	1.2	2.62	13.6	26 14.9	21 18.5	− 5 45.4	−0.0883	0.6017	0.0772	+16	−43
116 B. Scorpii	6.2	2.63	13.5	26 21.4	22 2.4	− 5 3.4	−0.0349	0.6020	0.0749	+19	−45
134 B. Scorpii	6.4	2.73	13.2	27 18.1	12 2 48.7	− 0 29.1	+0.5881	0.6029	0.0597	+54	−10
118 B. Ophiuchi	6.2	+2.86	−11.7	−26 24.1	11 10.2	+ 7 31.1	−0.6977	0.6037	−0.0326	−19	−90
95 G. Ophiuchi	6.1	2.92	11.8	27 39.7	13 11.6	+ 9 27.5	+0.5045	0.6037	0.0260	+40	−13
36 Ophi. (*1st star*)	5.4	2.89	12.1	26 29.0	14 18.6	+10 31.5	−0.7040	0.6037	0.0223	−21	−90
43 Ophiuchi	5.4	3.01	11.3	28 3.9	17 13.6	−10 40.9	+0.8316	0.6034	0.0128	+62	− 6
151 G. Ophiuchi	6.0	3.02	10.1	26 12.5	20 21.1	− 7 41.3	−1.0559	0.6030	−0.0026	−44	−90
163 G. Ophiuchi	6.3	+3.13	− 9.9	−27 50.8	13 0 36.4	− 3 36.8	+0.6084	0.6021	+0.0112	+52	− 8
X Sagittarii (*var.*)	4.4	3.16	9.6	27 48.1	2 11.5	− 2 5.7	+0.5856	0.6017	0.0164	+51	−10
4 G. Sagittarii	6.2	3.15	9.2	26 56.9	2 32.4	− 1 45.7	−0.2671	0.6016	0.0175	+ 2	−60
10 G. Sagittarii	5.7	3.23	9.0	28 3.3	5 35.2	+ 1 9.4	+0.9144	0.6006	0.0273	+62	−12
66 B. Sagittarii	4.7	3.34	7.0	27 4.6	13 36.4	+ 8 50.5	+0.2503	0.5972	0.0526	+32	−29
67 B. Sagittarii	6.4	+3.31	− 6.6	−25 38.4	13 52.2	+ 9 5.7	−1.1852	0.5971	+0.0534	−51	−89
68 G. Sagittarii	6.2	3.40	6.2	26 41.3	17 16.3	−11 38.7	+0.0720	0.5954	0.0638	+24	−39
λ Sagittarii	2.9	3.36	5.9	25 28.3	17 23.0	−11 32.2	−1.1493	0.5954	0.0642	−47	−90
69 G. Sagittarii	6.3	3.40	6.2	26 48.6	17 24.8	−11 30.5	+0.2052	0.5953	0.0643	+31	−31
86 B. Sagittarii	6.5	3.40	6.1	26 38.3	17 44.2	−11 11.9	+0.0523	0.5952	0.0653	+23	−40
126 B. Sagittarii	5.7	+3.46	− 4.2	−25 5.9	23 49.4	− 5 21.7	−1.0528	0.5916	+0.0835	−37	−90
φ Sagittarii	3.3	3.52	4.8	27 4.8	14 0 6.6	− 5 5.2	+0.9774	0.5914	0.0843	+63	+16
σ Sagittarii	2.1	3.56	3.8	26 24.3	3 49.9	− 1 30.9	+0.6276	0.5890	0.0951	+59	− 8
162 B. Sagittarii	6.4	3.54	3.0	24 59.5	5 2.9	− 0 20.9	−0.6865	0.5881	0.0985	−13	−90
127 G. Sagittarii	6.4	3.56	2.8	25 3.7	5 51.1	+ 0 25.4	−0.5356	0.5876	0.1008	− 5	−80
172 B. Sagittarii	5.8	+3.56	− 2.8	−24 57.9	6 39.3	+ 1 11.7	−0.5515	0.5870	+0.1030	− 5	−82
189 B. Sagittarii	6.1	3.60	2.0	24 47.5	8 55.2	+ 3 22.2	−0.4882	0.5854	0.1093	− 1	−70
201 B. Sagittarii	5.9	3.66	2.1	26 3.1	10 51.8	+ 5 14.1	+1.0085	0.5839	0.1146	+64	+18
ψ Sagittarii	4.9	3.66	1.6	25 24.3	11 47.0	+ 6 7.2	+0.4589	0.5832	0.1171	+50	−18
208 B. Sagittarii	6.1	3.63	1.3	24 19.5	11 48.1	+ 6 8.2	−0.6359	0.5832	0.1171	− 8	−90
χ Sagittarii	4.9	+3.69	− 0.5	−24 40.5	15 39.9	+ 9 50.9	+0.1912	0.5802	+0.1273	+36	−32
49 Sagittarii	5.5	3.67	− 0.3	24 7.8	15 45.8	+ 9 56.6	−0.3508	0.5802	0.1275	+ 8	−65
51 Sagittarii	5.8	3.76	+ 0.4	24 54.3	19 59.2	− 9 59.8	+1.0013	0.5768	0.1382	+65	+16
h Sagittarii	4.7	3.77	0.4	25 4.3	20 15.3	− 9 44.4	+1.2082	0.5766	0.1389	+65	+30
53 Sagittarii	6.3	3.74	1.2	23 37.3	21 32.6	− 8 30.0	−0.0894	0.5755	0.1420	+22	−45
274 B. Sagittarii	6.1	+3.74	+ 1.2	−23 37.4	21 39.8	− 8 23.1	−0.0699	0.5754	+0.1423	+23	−47
329 B. Sagittarii	6.1	3.84	3.5	22 58.2	15 6 26.0	+ 0 3.3	+0.6025	0.5680	0.1627	+63	−10
336 B. Sagittarii	6.5	3.84	3.8	22 50.0	7 24.9	+ 0 59.9	+0.6231	0.5672	0.1648	+64	− 9
4 Capricorni	5.7	3.90	5.4	22 4.3	13 27.3	+ 6 49.0	+0.8787	0.5620	0.1775	+68	+ 7
υ Capricorni	5.3	3.89	8.8	18 26.2	23 1.9	− 7 57.0	−1.0693	0.5538	0.1957	−26	−90
81 B. Capricorni	6.4	+3.94	+ 9.7	−18 20.8	16 3 8.2	− 3 59.4	−0.3438	0.5504	+0.2027	+17	−64
19 Capricorni	5.7	3.95	10.2	18 14.6	5 34.5	− 1 38.2	+0.0475	0.5484	0.2067	+37	−41
21 Capricorni	6.5	3.97	10.9	17 51.6	8 18.4	+ 1 0.2	+0.2224	0.5462	0.2110	+47	−31
URANUS	6.0	. . .	. . .	17 55.9	8 59.6	+ 1 39.9	+0.4417	0.5459	0.2121	+59	−19
θ Capricorni	4.2	3.99	11.4	17 34.1	10 36.5	+ 3 13.5	+0.4109	0.5444	0.2144	+58	−22
29 Capricorni	5.5	+3.98	+13.0	−15 31.3	15 7.1	+ 7 35.0	−0.7261	0.5409	+0.2208	− 1	−90

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		s	"	° '	d h m	h m				°	°
Capricorni	5.1	+4.04	+15.4	−14 25.4	17 3 13.5	− 4 42.5	+0.8983	0.5321	+0.2355	+76	+ 6
Capricorni	5.5	4.00	16.9	11 45.2	5 37.5	− 2 23.1	−1.3136	0.5305	0.2379	−42	−85
B. Capricorni	6.1	4.05	16.8	13 6.9	7 7.5	− 0 56.0	+0.4630	0.5296	0.2394	+65	−19
B. Aquarii	6.0	4.06	20.0	9 27.5	20 26.5	+11 57.9	−0.0915	0.5218	0.2505	+36	−48
Aquarii	5.3	4.05	20.6	8 14.6	22 5.8	−10 25.9	−0.9506	0.5209	0.2515	− 9	−90
B. Aquarii	6.0	+4.05	+21.0	− 7 37.1	23 45.9	− 8 48.8	−1.1854	0.5201	+0.2526	−26	−90
B. Aquarii	6.1	4.07	21.6	6 59.0	18 3 39.2	− 5 2.7	−0.8674	0.5182	0.2548	− 4	−90
Aquarii	6.4	4.12	22.3	7 24.1	9 41.2	+ 0 48.3	+1.1196	0.5157	0.2576	+83	+19
B. Aquarii	5.8	4.12	23.6	5 26.1	15 47.5	+ 6 43.7	+0.6267	0.5134	0.2598	+82	−11
G. Aquarii	6.3	4.12	23.7	5 15.5	16 52.5	+ 7 46.7	+0.7224	0.5131	0.2601	+85	− 6
B. Aquarii	6.1	+4.14	+24.0	− 5 9.7	19 3.3	+ 9 53.6	+1.1892	0.5124	+0.2606	+85	+25
B. Piscium	6.4	4.13	26.3	− 0 10.1	19 6 27.9	− 3 1.8	−1.1163	0.5096	0.2619	−18	−90
Piscium	5.7	4.15	27.2	+ 1 38.3	13 11.2	+ 3 29.7	−1.2785	0.5085	0.2616	−33	−88
Piscium	4.6	4.18	27.1	1 19.2	16 9.0	+ 6 22.3	−0.1661	0.5082	0.2612	+34	−52
Piscium	5.4	4.17	27.7	3 1.4	18 25.4	+ 8 34.7	−1.3883	0.5080	0.2607	−47	−78
Piscium	5.8	+4.20	+27.8	+ 2 27.9	21 20.6	+11 24.8	−0.0342	0.5077	+0.2600	+41	−45
Piscium	6.2	4.21	27.7	1 37.5	21 55.7	+11 58.9	+1.0142	0.5077	0.2599	+90	+11
Piscium	5.6	4.30	29.2	6 29.7	20 18 33.6	+ 8 0.9	+1.0844	0.5086	0.2505	+90	+18
B. Piscium	6.5	4.31	29.5	8 54.0	23 9.9	−11 30.9	−0.3569	0.5092	0.2474	+25	−61
Piscium	6.3	4.40	29.7	12 30.5	21 12 19.4	+ 1 15.4	−1.0687	0.5119	0.2365	−17	−78
η Piscium	3.7	+4.48	+29.2	+14 55.0	22 1 6.2	−10 20.4	−0.7422	0.5155	+0.2231	+ 4	−75
1 Piscium	6.2	4.49	29.1	14 14.1	3 17.6	− 8 13.0	+0.4833	0.5161	0.2205	+73	−13
5 Piscium	6.1	4.52	29.0	15 59.0	5 15.5	− 6 18.6	−0.9860	0.5168	0.2181	−12	−74
3 Arietis	6.4	4.54	28.8	16 59.7	8 44.8	− 2 55.6	−1.3360	0.5180	0.2137	−46	−73
4 Arietis	5.8	4.55	28.7	16 32.4	9 33.3	− 2 8.5	−0.6688	0.5182	0.2127	+ 7	−73
ι Arietis	5.1	+4.58	+28.4	+17 24.6	14 9.3	+ 2 19.0	−0.6533	0.5199	+0.2065	+ 8	−72
5 B. Arietis	6.4	4.60	28.1	17 51.2	17 19.9	+ 5 23.8	−0.4874	0.5210	0.2020	+17	−62
17 B. Arietis	6.5	4.60	27.9	17 38.0	19 21.2	+ 7 21.4	+0.1586	0.5218	0.1991	+52	−27
20 H¹. Arietis	6.4	4.60	27.8	16 50.0	20 9.5	+ 8 8.2	+1.1913	0.5221	0.1979	+90	+35
15 Arietis	5.9	4.63	27.7	19 6.4	20 45.3	+ 8 42.9	−1.1749	0.5223	0.1971	−28	−71
θ Arietis	5.6	+4.65	+27.4	+19 31.0	23 0 28.0	−11 41.3	−0.9017	0.5237	+0.1914	− 7	−70
26 Arietis	6.2	4.68	26.6	19 29.2	6 36.6	− 5 44.1	+0.2767	0.5261	0.1816	+59	−18
ν Arietis	5.4	4.73	26.0	21 36.1	10 34.5	− 1 53.8	−1.3358	0.5276	0.1749	−56	−68
μ Arietis	5.7	4.70	26.0	19 39.4	12 19.2	− 0 12.3	+1.0999	0.5283	0.1720	+90	+30
ε Arietis (*mean*)	4.6	4.75	24.7	21 0.5	20 25.3	+ 7 38.4	+0.9536	0.5314	0.1575	+90	+22
64 Arietis	5.8	+4.87	+22.4	+24 25.8	24 8 17.4	− 4 52.5	−1.0802	0.5358	+0.1345	−23	−66
66 Arietis	6.1	4.82	22.3	22 31.1	10 15.7	− 2 58.1	+1.2897	0.5365	0.1305	+75	+56
7 Tauri	5.9	4.87	21.6	24 11.2	13 3.1	− 0 16.2	−0.1946	0.5374	0.1247	+32	−36
11 Tauri	6.1	4.90	20.9	25 3.7	15 59.6	+ 2 34.5	−0.8030	0.5384	0.1186	− 3	−65
16 Tauri	5.4	4.87	20.7	24 1.7	17 53.1	+ 4 24.3	+0.5580	0.5390	0.1146	+82	+ 3
17 Tauri	3.8	+4.87	+20.7	+23 51.2	17 55.3	+ 4 26.4	+0.7565	0.5390	+0.1145	+90	+14
18 Tauri	5.6	4.89	20.6	24 34.8	18 2.6	+ 4 33.5	−0.0320	0.5391	0.1142	+41	−27
q Tauri	4.3	4.88	20.7	24 12.4	18 4.2	+ 4 35.1	+0.3819	0.5391	0.1142	+67	− 6
20 Tauri	4.1	4.87	20.6	24 6.5	18 21.6	+ 4 51.9	+0.5238	0.5392	0.1135	+79	+ 1
21 Tauri	5.8	4.88	20.6	24 17.7	18 23.7	+ 4 53.9	+0.3211	0.5392	0.1135	+63	− 9
22 Tauri	6.5	+4.88	+20.6	+24 16.2	18 27.6	+ 4 57.6	+0.3578	0.5392	+0.1133	+65	− 7
23 Tauri	4.3	4.86	20.6	23 41.4	18 35.9	+ 5 5.7	+1.0133	0.5392	0.1130	+90	+31
η Tauri	3.0	4.87	20.5	23 50.9	19 8.0	+ 5 36.7	+0.8982	0.5394	0.1119	+90	+23
27 Tauri	3.7	4.87	20.4	23 48.0	19 54.8	+ 6 22.0	+1.0389	0.5396	0.1102	+90	+33
28 Tauri	5.2	4.87	20.4	23 53.0	19 55.4	+ 6 22.6	+0.9477	0.5396	0.1102	+90	+27
14 H. Tauri	5.3	+4.91	+20.0	+25 19.8	20 25.4	+ 6 51.6	−0.5952	0.5398	+0.1091	+10	−58
p Tauri	5.6	4.94	17.9	26 15.9	25 5 52.6	− 8 0.1	−0.6973	0.5423	0.0883	+ 3	−63
χ Tauri	5.3	4.91	16.9	25 26.1	11 16.2	− 2 47.4	+0.6654	0.5435	0.0760	+90	+13
17 B. Aurigæ	6.0	4.96	13.3	27 45.6	26 0 57.9	+10 26.5	−1.0901	0.5457	0.0439	−26	−62
38 B. Aurigæ	6.5	4.94	12.0	27 34.9	6 19.8	− 8 22.6	−0.6912	0.5461	0.0311	+ 3	−60
47 B. Aurigæ	6.0	+4.94	+11.5	+27 55.6	8 38.2	− 6 8.9	−1.0097	0.5462	+0.0256	−19	−62

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

OCTOBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	"	° '	d h m	h m				°	°
354 B. Tauri	6.4	+4.91	+10.2	+27 52.5	26 13 43.1	− 1 14.3	−0.8528	0.5464	+0.0134	− 8	−62
107 B. Aurigæ	6.5	4.87	8.6	27 36.6	20 28.3	+ 5 17.0	−0.5237	0.5462	−0.0029	+13	−46
112 B. Aurigæ	5.7	4.84	8.7	26 52.5	21 2.1	+ 5 49.7	+0.2905	0.5461	0.0043	+61	0
406 B. Tauri	5.6	4.84	6.9	27 56.7	27 3 15.9	+11 50.6	−0.9712	0.5456	0.0193	−16	−62
136 Tauri	4.6	4.82	6.6	27 35.7	4 20.4	−11 7.1	−0.6045	0.5457	0.0219	+ 8	−53
139 Tauri	4.7	+4.74	+ 6.6	+25 56.8	6 29.1	− 9 2.7	+1.1722	0.5452	−0.0270	+90	+52
415 B. Tauri	6.1	4.79	5.8	27 34.2	7 49.3	− 7 45.2	−0.6678	0.5450	0.0302	+ 5	−58
ε Geminorum	3.2	4.53	1.6	25 13.0	28 3 27.2	+11 12.8	+0.8948	0.5409	0.0759	+90	+26
37 Geminorum	5.7	4.48	+ 0.3	25 29.0	8 41.9	− 7 43.1	+0.1707	0.5394	0.0876	+53	−14
39 Geminorum	6.2	4.49	− 0.3	26 11.6	10 18.1	− 6 10.0	−0.7582	0.5389	0.0912	− 1	−64
40 Geminorum	6.3	+4.49	− 0.4	+26 1.8	10 36.6	− 5 52.2	−0.6059	0.5388	−0.0919	+ 9	−58
ω Geminorum	5.2	4.41	0.1	24 20.3	12 0.4	− 4 31.1	+1.1343	0.5384	0.0949	+90	+42
48 Geminorum	5.8	4.36	1.2	24 16.3	16 40.4	− 0 0.4	+0.7397	0.5370	0.1051	+90	+14
52 Geminorum	6.1	4.38	1.8	25 2.0	17 42.7	+ 0 59.8	−0.2114	0.5366	0.1073	+31	−36
A Geminorum	5.1	4.33	2.7	25 12.8	21 49.4	+ 4 58.4	−0.8694	0.5353	0.1160	− 7	−65
B. D.+23° 1744	6.4	+4.21	− 3.0	+23 4.1	29 2 16.1	+ 9 16.5	+0.9586	0.5338	−0.1251	+90	+26
176 B. Geminorum	6.3	4.23	4.1	24 33.0	4 47.6	+11 43.0	−0.9944	0.5329	0.1302	−16	−65
181 B. Geminorum	6.0	4.22	4.1	24 24.9	5 15.0	−11 50.4	−0.9049	0.5327	0.1311	−10	−66
187 B. Geminorum	6.3	4.17	3.9	23 12.9	6 6.8	−11 0.4	+0.3008	0.5324	0.1328	+61	−13
192 B. Geminorum	6.3	4.13	3.9	22 36.0	7 15.6	− 9 53.8	+0.8239	0.5320	0.1351	+90	+16
82 Geminorum	6.3	+4.13	− 4.7	+23 21.1	9 43.0	− 7 31.1	−0.3399	0.5311	−0.1399	+24	−46
9 Cancri	6.2	4.01	6.4	22 52.6	18 13.8	+ 0 43.3	−1.0786	0.5282	0.1561	−22	−67
μ Cancri	5.5	3.97	6.2	21 49.6	18 56.9	+ 1 25.0	−0.0413	0.5280	0.1574	+41	−32
49 B. Cancri	6.0	3.87	7.2	21 0.9	30 1 3.3	+ 7 19.7	−0.1464	0.5259	0.1683	+35	−39
η Cancri	5.5	3.78	8.2	20 43.7	7 5.7	−10 49.3	−0.8812	0.5238	0.1786	− 6	−69
39 Cancri	6.5	+3.73	− 8.8	+20 18.4	10 44 1	− 7 17.7	−1.0808	0.5227	−0.1846	−20	−70
40 Cancri	6.5	3.73	8.8	20 16.2	10 46.6	− 7 15.3	−1.0490	0.5227	0.1847	−18	−70
102 B. Cancri	6.5	3.71	8.7	19 58.1	10 52.0	− 7 10.1	−0.7381	0.5226	0.1848	+ 3	−70
ε Cancri	6.3	3.71	8.6	19 50.6	10 54.6	− 7 7.5	−0.6100	0.5226	0.1849	+10	−67
δ Cancri	4.2	3.65	8.7	18 27.9	13 0.9	− 5 5.2	+0.4969	0.5220	0.1883	+75	− 8
139 B. Cancri	6.1	+3.63	− 9.3	+19 8.9	16 0.2	− 2 11.5	−0.8142	0.5211	−0.1930	− 2	−71
X Cancri (*var.*)	6.2	3.56	9.2	17 33.2	18 19.1	+ 0 3.1	+0.4653	0.5204	0.1965	+72	−11
81 Cancri	6.4	3.38	9.6	15 20.2	31 2 48.0	+ 8 16.5	+1.1407	0.5182	0.2088	+90	+28
π Cancri	5.6	3.38	10.1	15 17.5	4 15.0	+ 9 40.8	+0.8841	0.5179	0.2108	+90	+10
227 B. Cancri	6.4	3.36	10.7	15 43.8	7 16.1	−11 23.6	−0.2307	0.5173	0.2149	+31	−49
7 Leonis	6.2	+3.25	−11.5	+14 45.4	14 38.9	− 4 14.3	−0.8030	0.5159	−0.2242	0	−75
11 Leonis	6.5	3.24	11.7	14 43.7	15 43.9	− 3 11.2	−1.0164	0.5158	0.2255	−14	−75
ψ Leonis	5.6	3.20	12.0	14 24.5	18 37.2	− 0 23.2	−1.3270	0.5154	0.2289	−42	−70
18 Leonis	5.8	3.14	11.4	12 11.9	19 59.3	+ 0 56.4	+0.7221	0.5152	0.2305	+90	− 1
19 Leonis	6.4	3.12	11.4	11 57.5	20 31.2	+ 1 27.4	+0.8560	0.5152	0.2311	+90	+ 6
R Leonis (*var.*)	5–10	+3.12	−11.4	+11 49.2	20 35.0	+ 1 31.1	+0.9890	0.5151	−0.2312	+90	+14

NOVEMBER.

Name.	Mag.	Δα	Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
ν Leonis	5.0	+3.08	−12.5	+12 50.8	1 1 59.1	+ 6 45.3	−1.3700	0.5147	−0.2370	−40	−73
A Leonis	4.6	+2.97	−12.4	+10 24.7	6 55.8	+11 33.1	+0.0388	0.5144	−0.2420	+45	−38
44 Leonis	5.9	2.87	13.1	9 12.8	15 45.4	− 3 53.2	−0.8617	0.5146	0.2498	− 3	−81
48 Leonis	5.2	2.78	13.0	7 23.3	20 37.4	+ 0 50.0	−0.1599	0.5150	0.2537	+35	−50
35 Sextantis	6.1	2.72	12.9	5 11.4	2 0 58.0	+ 5 2.8	+1.0412	0.5154	0.2567	+90	−14
37 Sextantis	6.3	2.72	13.6	6 49.1	2 21.0	+ 6 23.3	−1.0222	0.5157	0.2576	−13	−83
d Leonis	5.0	+2.62	−13.5	+ 4 4.2	9 40.2	−10 30.8	−0.0459	0.5170	−0.2618	+41	−45
p^4 Leonis	5.7	2.54	13.4	2 24.8	12 53.1	− 7 23.8	+0.8365	0.5179	0.2633	+90	+ 1
75 Leonis	5.4	2.52	14.0	2 28.5	18 4.0	− 2 22.4	−0.5971	0.5194	0.2654	+12	−80
76 Leonis	6.0	2.51	13.9	2 6.8	18 53.1	− 1 34.8	−0.4387	0.5106	0.2657	+20	−68
359 B. Leonis	6.3	2.48	13.6	0 35.7	21 4.4	+ 0 32.5	+0.5526	0.5204	0.2663	+77	−14
79 Leonis	5.5	+2.49	−14.0	+ 1 52.2	21 26.2	+ 0 53.6	−0.8656	0.5205	−0.2664	− 3	−88

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.		Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d	h m	h m				°	°
υ Leonis	4.5	+2.41	−14.0	− 0 21.5	8	3 50.0	+ 7 5.5	−0.2689	0.5230	−0.2678	+29	−58
131 B. Leonis	6.2	2.39	13.6	1 58.2		4 33.2	+ 7 47.3	+1.1995	0.5233	0.2679	+88	+26
78 B. Virginis	6.5	2.24	14.1	5 15.0		21 55.8	+ 0 37.0	−0.1003	0.5323	0.2668	+37	−48
q Virginis	5.3	2.17	14.1	8 59.2	4	7 7.0	+ 9 30.2	+1.2570	0.5384	0.2632	+81	+32
χ Virginis	4.8	2.16	14.5	7 31.9		9 39.4	+11 57.5	−0.8833	0.5402	0.2619	− 5	−90
				NEW	*MOON.*							
118 B. Ophiuchi	6.2	+2.63	−10.4	−26 24.1	8	19 29.6	− 6 21.7	−0.5059	0.6152	−0.0313	− 9	−78
95 G. Ophiuchi	6.1	2.68	10.3	27 39.6		21 27.0	− 4 29.4	+0.6808	0.6152	0.0246	+59	− 4
36 Ophi. (*1st star*)	5.4	2.64	10.9	26 28.9		22 31.8	− 3 27.5	−0.5063	0.6151	0.0209	−10	−78
43 Ophiuchi	5.4	+2.74	− 9.8	−28 3.9	9	1 21.0	− 0 45.7	+1.0098	0.6149	−0.0113	+62	+19
136 G. Ophiuchi	6.3	2.72	9.2	25 52.3		2 39.4	+ 0 29.3	−1.1668	0.6147	0.0068	−53	−90
151 G. Ophiuchi	6.0	2.75	9.0	26 12.5		4 22.5	+ 2 7.9	−0.8417	0.6144	−0.0009	−30	−90
163 G. Ophiuchi	6.3	2.83	8.6	27 50.8		8 29.4	+ 6 4.0	+0.8029	0.6135	+0.0131	+62	+ 4
X Sagittarii (*var.*)	4.4	2.85	8.4	27 48.1		10 1.4	+ 7 31.9	+0.7831	0.6130	0.0183	+62	+ 3
4 G. Sagittarii	6.2	+2.84	− 8.2	−26 56.9		10 21.6	+ 7 51.3	−0.0552	0.6129	+0.0194	+13	−46
10 G. Sagittarii	5.7	2.91	7.8	28 3.3		13 18.4	+10 40.4	+1.1124	0.6118	0.0293	+62	+29
66 B. Sagittarii	4.7	2.99	6.2	27 4.5		21 4.3	− 5 53.8	+0.4716	0.6081	0.0549	+46	−16
67 B. Sagittarii	6.4	2.96	5.9	25 38.4		21 19.6	− 5 39.2	−0.9407	0.6080	0.0557	−32	−90
68 G. Sagittarii	6.2	3.03	5.5	26 41.3	10	0 37.4	− 2 29.9	+0.3016	0.6060	0.0663	+36	−26
λ Sagittarii	2.9	+3.00	− 5.3	−25 28.3		0 43.9	− 2 23.7	−0.9004	0.6059	+0.0666	−29	−90
69 G. Sagittarii	6.3	3.04	5.5	26 48.6		0 45.6	− 2 22.1	+0.4329	0.6059	0.0667	+44	−18
86 B. Sagittarii	6.5	3.03	5.4	26 38.3		1 4.4	− 2 4.0	+0.2829	0.6057	0.0677	+36	−27
126 B. Sagittarii	5.7	3.08	3.8	25 5.9		6 58.5	+ 3 35.0	−0.7966	0.6017	0.0860	−20	−90
φ Sagittarii	3.3	3.14	4.3	27 4.8		7 15.1	+ 3 51.0	+1.2029	0.6015	0.0869	+63	+38
σ Sagittarii	2.1	+3.17	− 3.4	−26 24.3		10 51.9	+ 7 18.8	+0.8637	0.5987	+0.0977	+64	+ 8
162 B. Sagittarii	6.4	3.15	2.8	24 59.5		12 2.8	+ 8 26.7	−0.4292	0.5978	0.1012	+ 1	−71
127 G. Sagittarii	6.4	3.16	2.6	25 3.7		12 49.6	+ 9 11.5	−0.2794	0.5972	0.1034	+ 9	−60
172 B. Sagittarii	5.8	3.17	2.6	24 57.9		13 36.5	+ 9 56.5	−0.2941	0.5965	0.1057	+ 9	−61
189 B. Sagittarii	6.1	3.20	1.9	24 47.5		15 48.5	−11 56.9	−0.2290	0.5947	0.1120	+12	−57
201 B. Sagittarii	5.9	+3.25	− 1.9	−26 3.0		17 41.8	−10 8.2	+1.2485	0.5931	+0.1173	+64	+44
ψ Sagittarii	4.9	3.25	1.6	25 24.3		18 35.6	− 9 16.6	+0.7080	0.5923	0.1197	+64	− 3
208 B. Sagittarii	6.1	3.22	1.3	24 19.5		18 36.7	− 9 15.5	−0.3712	0.5922	0.1198	+ 6	−66
χ Sagittarii	4.9	3.28	0.6	24 40.5		22 22.2	− 5 39.2	+0.4487	0.5888	0.1299	+50	−18
49 Sagittarii	5.5	3.26	− 0.3	24 7.8		22 28.0	− 5 33.6	−0.0857	0.5888	0.1302	+21	−48
51 Sagittarii	5.8	+3.34	+ 0.3	−24 54.4	11	2 34.8	− 1 36.7	+1.2528	0.5849	+0.1408	+65	+43
53 Sagittarii	6.3	3.32	1.0	23 37.3		4 5.9	− 0 9.2	+0.1784	0.5834	0.1446	+37	−33
274 B. Sagittarii	6.1	3.32	1.0	23 37.5		4 12.9	− 0 2.5	+0.1978	0.5834	0.1449	+38	−32
329 B. Sagittarii	6.1	3.41	3.0	22 58.3		12 46.8	+ 8 11.5	+0.8703	0.5750	0.1651	+67	+ 7
336 B. Sagittarii	6.5	3.42	3.3	22 50.0		13 44.4	+ 9 6.9	+0.8916	0.5740	0.1672	+67	+ 8
4 Capricorni	5.7	+3.47	+ 4.6	−22 4.3		19 39.2	− 9 11.7	+1.1496	0.5681	+0.1797	+68	+28
ο Capricorni	5.6	3.44	6.7	18 51.8	12	0 41.9	− 4 20.1	−1.1779	0.5630	0.1895	−36	−90
υ Capricorni	5.3	3.48	7.8	18 26.2		5 3.3	− 0 8.2	−0.7723	0.5588	0.1974	− 7	−90
81 B. Capricorni	6.4	3.52	8.6	18 20.9		9 5.6	+ 3 45.5	−0.0522	0.5548	0.2042	+32	−46
19 Capricorni	5.7	3.54	9.1	18 14.6		11 29.7	+ 6 4.5	+0.3365	0.5525	0.2081	+53	−25
94 B. Capricorni	5.7	+3.52	+10.0	−16 21.4		12 47.2	+ 7 19.3	−1.3254	0.5512	+0.2101	−50	−79
21 Capricorni	6.5	3.57	9.7	17 51.6		14 11.3	+ 8 40.5	+0.5108	0.5500	0.2122	+63	−16
URANUS	6.0	. . .	. . .	17 52.0		15 11.7	+ 9 38.8	+0.7316	0.5483	0.2135	+72	− 3
θ Capricorni	4.2	3.59	10.2	17 34.1		16 27.6	+10 52.1	+0.6983	0.5478	0.2155	+72	− 5
29 Capricorni	5.5	3.58	11.8	15 31.3		20 55.0	− 8 49.7	−0.4295	0.5438	0.2216	+15	−69
42 Capricorni	5.1	+3.67	+14.0	−14 25.4	13	8 54.7	+ 2 46.1	+1.1839	0.5337	+0.2354	+76	+26
λ Capricorni	5.5	3.64	15.5	11 45.2		11 17.7	+ 5 4.5	−1.0173	0.5318	0.2378	−16	−90
151 B. Capricorni	6.1	3.68	15.3	13 6.9		12 47.3	+ 6 31.1	+0.7501	0.5307	0.2392	+77	− 3
96 B. Aquarii	6.5	3.65	16.4	10 42.5		14 41.1	+ 8 21.3	−1.2939	0.5293	0.2409	−39	−89
θ Aquarii	4.3	3.71	19.0	8 12.1	14	2 2.1	− 4 39.1	−1.1282	0.5216	0.2493	−22	−90
150 B. Aquarii	6.0	+3.73	+18.5	− 9 27.5		2 3.3	− 4 38.0	+0.1906	0.5216	+0.2493	+51	−33

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		$\Delta\alpha$	$\Delta\delta$								
		s	″	° ′	d h m	h m				°	°
ρ Aquarii	5.3	+3.73	+19.2	− 8 14.6	14 3 42.5	− 3 1.8	−0.6676	0.5206	+0.2503	+ 6	−88
170 B. Aquarii	6.0	3.73	19.7	7 37.1	5 22.5	− 1 24.8	−0.9035	0.5196	0.2512	− 6	−90
186 B. Aquarii	6.1	3.76	20.3	6 59.0	9 15.7	+ 2 21.2	−0.5902	0.5174	0.2532	+11	−80
67 Aquarii	6.4	3.83	20.9	7 24.1	15 18.2	+ 8 12.7	+1.3881	0.5144	0.2556	+77	+49
252 B. Aquarii	5.8	3.85	22.3	5 26.1	21 25.5	− 9 50.9	+0.8885	0.5118	0.2574	+85	+ 4
197 G. Aquarii	6.3	+3.86	+22.5	− 5 15.5	22 30.7	− 8 47.7	+0.9829	0.5113	+0.2576	+85	+10
22 B. Piscium	6.4	3.92	25.5	− 0 10.1	15 12 10.4	+ 4 28.0	−0.8778	0.5071	0.2588	− 3	−90
9 Piscium	6.4	3.93	25.8	+ 0 39.8	14 7.5	+ 6 21.6	−1.2574	0.5066	0.2587	−31	−89
16 Piscium	5.7	3.96	26.5	1 38.3	18 56.6	+11 2.4	−1.0529	0.5057	0.2582	−15	−88
λ Piscium	4.6	3.99	26.4	1 19.2	21 55.7	−10 3.7	+0.0563	0.5053	0.2577	+46	−40
19 Piscium	5.4	+4.00	+27.2	+ 3 1.4	16 0 13.3	− 7 50.0	−1.1734	0.5050	+0.2572	−23	−87
22 Piscium	5.8	4.04	27.2	2 27.9	3 10.0	− 4 58.4	+0.1784	0.5047	0.2564	+53	−33
25 Piscium	6.2	4.05	27.0	1 37.5	3 45.4	− 4 24.0	+1.2285	0.5047	0.2563	+90	+25
51 Piscium	5.6	4.22	29.1	6 29.7	17 0 35.0	− 8 10.3	+1.2547	0.5053	0.2466	+90	+32
136 B. Piscium	6.5	4.26	29.6	8 54.0	5 14.0	− 3 39.3	−0.2032	0.5060	0.2435	+32	−52
75 Piscium	6.3	+4.41	+30.4	+12 30.6	18 31.3	+ 9 14.8	−0.9508	0.5089	+0.2327	− 9	−77
η Piscium	3.7	4.56	30.3	14 55.0	18 7 25.1	− 2 14.1	−0.6554	0.5129	0.2195	+ 8	−75
101 Piscium	6.2	4.57	30.0	14 14.1	9 37.7	− 0 5.4	+0.5694	0.5137	0.2169	+80	− 5
105 Piscium	6.1	4.62	30.2	15 59.0	11 36.7	+ 1 50.0	−0.9111	0.5144	0.2146	− 7	−74
3 Arietis	6.4	4.66	30.1	16 59.8	15 7.6	+ 5 14.7	−1.2715	0.5157	0.2103	−37	−73
4 Arietis	5.8	+4.66	+30.0	+16 32.5	15 56.5	+ 6 2.1	−0.6037	0.5160	+0.2092	+11	−70
ι Arietis	5.1	4.72	29.7	17 24.7	20 34.7	+10 31.9	−0.6002	0.5178	0.2032	+11	−69
35 B. Arietis	6.4	4.75	29.5	17 51.2	23 46.7	−10 21.9	−0.4419	0.5192	0.1988	+19	−60
47 B. Arietis	6.5	4.77	29.3	17 38.0	19 1 48.9	− 8 23.4	+0.2014	0.5200	0.1959	+54	−24
20 H¹. Arietis	6.4	4.78	28.9	16 50.0	2 37.5	− 7 36.3	+1.2360	0.5204	0.1948	+90	+39
15 Arietis	5.9	+4.81	+29.3	+19 6.5	3 13.6	− 7 1.3	−1.1408	0.5206	+0.1939	−25	−71
θ Arietis	5.6	4.85	28.9	19 31.0	6 57.8	− 3 24.0	−0.8761	0.5222	0.1883	− 6	−70
26 Arietis	6.2	4.92	28.1	19 29.2	13 8.5	+ 2 35.3	+0.2908	0.5248	0.1787	+60	−18
ν Arietis	5.4	4.99	27.8	21 36.1	17 7.8	+ 6 27.1	−1.3373	0.5267	0.1721	−59	−64
μ Arietis	5.7	4.97	27.4	19 39.5	18 52.9	+ 8 8.9	+1.1020	0.5274	0.1692	+90	+31
ε Arietis (*mean*)	4.6	+5.07	+26.3	+21 0.5	20 3 1.3	− 7 58.1	+0.9346	0.5310	+0.1548	+90	−21
64 Arietis	5.8	5.26	24.3	24 25.8	14 55.7	+ 3 33.3	−1.1339	0.5360	0.1321	−28	−60
66 Arietis	6.1	5.22	23.8	22 31.1	16 54.4	+ 5 28.1	+1.2373	0.5368	0.1281	+85	+40
7 Tauri	5.9	5.29	23.4	24 11.2	19 42.1	+ 8 10.3	−0.2573	0.5378	0.1224	+20	−40
11 Tauri	6.1	5.34	22.8	25 3.7	22 38.9	+11 1.3	−0.8741	0.5389	0.1163	− 8	−65
16 Tauri	5.4	+5.32	+22.3	+24 1.7	21 0 32.7	−11 8.5	+0.4856	0.5396	+0.1123	+75	0
17 Tauri	3.8	5.32	22.3	23 51.2	0 34.8	−11 6.5	+0.6844	0.5396	0.1122	+90	+11
18 Tauri	5.6	5.34	22.3	24 34.8	0 42.2	−10 59.4	−0.1062	0.5397	0.1120	+37	−30
q Tauri	4.3	5.33	22.3	24 12.5	0 43.8	−10 57.8	+0.3086	0.5397	0.1119	+62	− 9
20 Tauri	4.1	5.32	22.2	24 6.5	1 1.2	−10 41.0	+0.4501	0.5398	0.1113	+72	− 2
21 Tauri	5.8	+5.33	+22.2	+24 17.8	1 3.3	−10 38.9	+0.2470	0.5398	+0.1112	+58	−12
22 Tauri	6.5	5.33	22.2	24 16.2	1 7.2	−10 35.2	+0.2835	0.5398	0.1111	+60	−10
23 Tauri	4.3	5.31	22.2	23 41.4	1 15.5	−10 27.2	+0.9402	0.5399	0.1108	+90	+20
η Tauri	3.0	5.32	22.1	23 51.0	1 47.7	− 9 56.0	+0.8237	0.5401	0.1097	+90	+19
27 Tauri	3.7	5.33	21.9	23 48.0	2 34.6	− 9 10.7	+0.9628	0.5403	0.1080	+90	+28
28 Tauri	5.2	+5.33	+21.9	+23 53.0	2 35.2	− 9 10.1	+0.8714	0.5403	+0.1080	+90	+22
14 H. Tauri	5.3	5.38	21.7	25 19.8	3 5.2	− 8 41.1	−0.6762	0.5405	0.1069	+ 5	−63
p Tauri	5.6	5.47	19.6	26 15.9	12 33.0	+ 0 27.8	−0.7997	0.5434	0.0861	− 3	−64
χ Tauri	5.3	5.47	18.3	25 26.1	17 56.7	+ 5 40.6	+0.5538	0.5448	0.0739	+82	+ 8
17 B. Aurigæ	6.0	5.61	14.5	27 45.6	22 7 38.5	− 5 5.4	−1.2340	0.5473	0.0419	−45	−62
38 B. Aurigæ	6.5	+5.61	+13.0	+27 34.9	13 0.4	+ 0 5.5	−0.8455	0.5478	+0.0291	− 7	−62
47 B. Aurigæ	6.0	5.63	12.4	27 55.7	15 18.7	+ 2 19.1	−1.1693	0.5479	0.0236	−36	−62
354 B. Tauri	6.4	5.63	11.0	27 52.5	20 23.5	+ 7 13.5	−1.0222	0.5481	+0.0114	−21	−62
107 B. Aurigæ	6.5	5.62	9.0	27 36.6	23 3 8.7	−10 15.1	−0.7057	0.5479	−0.0049	+ 2	−60
112 B. Aurigæ	5.7	5.58	8.9	26 52.5	3 42.5	− 9 42.4	+0.1090	0.5478	0.0062	+49	− 9
125 Tauri	5.1	+5.54	+ 8.8	+25 51.2	4 53.9	− 8 33.5	+1.2359	0.5477	−0.0091	+80	+60

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

NOVEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
56 B. Tauri	5.6	+5.62	+ 7.0	+27 56.7	23 9 56.6	− 3 41.1	−1.1671	0.5472	−0.0212	−35	−62
36 Tauri	4.6	5.60	6.7	27 35.7	11 1.1	− 2 38.8	−0.8016	0.5471	0.0238	− 4	−62
39 Tauri	4.7	5.52	6.4	25 56.8	13 9.9	− 0 34.3	+0.9751	0.5468	0.0289	+90	+37
15 B. Tauri	6.1	5.59	5.7	27 34.2	14 30.2	+ 0 43.2	−0.8715	0.5465	0.0321	− 9	−62
ε Geminorum	3.2	5.39	+ 0.4	25 13.0	24 10 10.6	− 4 16.2	+0.6615	0.5417	0.0775	+90	+13
37 Geminorum	5.7	+5.36	− 1.2	+25 29.0	15 26.5	+ 0 49.1	−0.0734	0.5400	−0.0892	+39	−27
39 Geminorum	6.2	5.37	1.7	26 11.6	17 3.2	+ 2 22.7	−1.0083	0.5394	0.0927	−18	−64
40 Geminorum	6.3	5.37	1.8	26 1.8	17 21.7	+ 2 40.6	−0.8560	0.5393	0.0934	− 7	−64
ω Geminorum	5.2	5.29	1.8	24 20.2	18 46.0	+ 4 2.1	+0.8886	0.5388	0.0964	+90	+24
48 Geminorum	5.8	5.25	3.2	24 16.3	23 27.5	+ 8 34.3	+0.4857	0.5370	0.1064	+75	+ 1
52 Geminorum	6.1	+5.28	− 3.7	+25 2.0	25 0 30.2	+ 9 34.9	−0.4709	0.5366	−0.1086	+17	−51
A Geminorum	5.1	5.24	4.8	25 12.8	4 38.5	−10 24.9	−1.1380	0.5350	0.1171	−29	−65
58 Geminorum	6.0	5.15	4.3	23 6.5	4 40.4	−10 23.0	+1.1898	0.5350	0.1172	+90	+45
B. D.+23° 1744	6.4	5.11	5.4	23 4.1	9 7.2	− 6 4.9	+0.6924	0.5332	0.1262	+90	+10
176 B. Geminorum	6.3	5.15	6.5	24 33.0	11 40.0	− 3 37.1	−1.2741	0.5321	0.1312	−47	−65
181 B. Geminorum	6.0	+5.14	− 6.6	+24 24.8	12 7.7	− 3 10.3	−1.1848	0.5319	−0.1321	−33	−66
187 B. Geminorum	6.3	5.08	6.5	23 12.9	12 59.9	− 2 19.8	+0.0262	0.5316	0.1338	+44	−26
192 B. Geminorum	6.3	5.05	6.6	22 35.9	14 9.3	− 1 12.6	+0.5507	0.5311	0.1360	+80	+ 1
82 Geminorum	6.3	5.05	7.4	23 21.0	16 38.1	+ 1 11.4	−0.6228	0.5300	0.1407	+ 8	−63
μ Cancri	5.5	4.90	9.5	21 49.6	26 1 58.0	+10 13.7	−0.3336	0.5260	0.1577	+24	−48
49 B. Cancri	6.0	+4.80	−10.7	+21 0.8	8 9.1	− 7 46.9	−0.4462	0.5234	−0.1684	+19	−56
NEPTUNE	7.7	. . .	. . .	19 17.8	9 53.8	− 6 5.4	+1.1460	0.5233	0.1714	+90	+34
η Cancri	5.5	4.72	12.0	20 43.6	14 16.9	− 1 50.5	−1.1927	0.5209	0.1784	−31	−69
102 B. Cancri	6.5	4.65	12.6	19 58.1	18 6.7	+ 1 52.3	−1.0521	0.5194	0.1843	−18	−70
ε Cancri	6.3	4.65	12.5	19 50.6	18 9.4	+ 1 54.9	−0.9230	0.5193	0.1844	− 9	−70
δ Cancri	4.2	+4.58	−12.8	+18 27.8	20 17.7	+ 3 59.3	+0.1915	0.5185	−0.1876	+54	−24
139 B. Cancri	6.1	4.57	13.4	19 8.8	23 20.2	+ 6 56.2	−1.1335	0.5174	0.1921	−24	−71
X Cancri (*var.*)	6.2	4.49	13.4	17 33.1	27 1 41.6	+ 9 13.3	+0.1558	0.5165	0.1955	+52	−27
81 Cancri	6.4	4.29	14.2	15 20.1	10 20.4	− 6 23.5	+0.8334	0.5136	0.2073	+90	+ 7
π Cancri	5.6	4.30	14.7	15 17.4	11 49.1	− 4 57.5	+0.5737	0.5132	0.2092	+80	− 7
227 B. Cancri	6.4	+4.28	−15.4	+15 43.7	14 54.1	− 1 58.0	−0.5537	0.5123	−0.2130	+14	−68
7 Leonis	6.2	4.16	16.4	14 45.3	22 26.9	+ 5 21.4	−1.1347	0.5103	0.2218	−23	−75
11 Leonis	6.5	4.14	16.6	14 43.6	23 33.4	+ 6 25.9	−1.3507	0.5101	0.2231	−47	−73
18 Leonis	5.8	4.04	16.4	12 11.8	28 3 55.1	+10 39.9	+0.4072	0.5092	0.2278	+67	−18
19 Leonis	6.4	4.02	16.4	11 57.4	4 27.8	+11 11.7	+0.5425	0.5091	0.2283	+77	−11
R Leonis (*var.*)	5–10	+4.02	−16.5	+11 49.1	4 31.7	+11 15.4	+0.6772	0.5091	−0.2284	+90	− 4
A Leonis	4.6	3.86	17.6	10 24.6	15 8.6	− 2 26.3	−0.2827	0.5076	0.2385	+28	−56
44 Leonis	5.9	3.74	18.4	9 12.7	29 0 12.9	+ 6 22.1	−1.1915	0.5072	0.2458	−26	−81
48 Leonis	5.2	3.64	18.3	7 23.2	5 13.3	+11 13.8	−0.4774	0.5073	0.2493	+18	−70
35 Sextantis	6.1	3.57	18.2	5 11.3	9 41.6	− 8 25.8	+0.7432	0.5077	0.2521	+90	− 3
37 Sextantis	6.3	+3.57	−18.9	+ 6 49.0	11 7.0	− 7 2.9	−1.3470	0.5078	−0.2529	−42	−82
d Leonis	5.0	3.45	18.8	4 4.1	18 39.4	+ 0 16.3	−0.3502	0.5090	0.2567	+25	−62
p^4 Leonis	5.7	3.37	18.6	2 24.7	21 58.2	+ 3 29.2	+0.5481	0.5097	0.2581	+77	−15
75 Leonis	5.4	3.34	19.2	2 28.4	30 3 18.6	+ 8 40.1	−0.8986	0.5110	0.2600	− 5	−88
76 Leonis	6.0	3.32	19.0	2 6.7	4 9.1	+ 9 29.2	−0.7370	0.5113	0.2602	+ 5	−88
359 B. Leonis	6.3	+3.28	−18.7	+ 0 35.6	6 24.5	+11 40.6	+0.2711	0.5120	−0.2608	+58	−29
79 Leonis	5.5	3.29	19.2	+ 1 52.2	6 46.9	−11 57.7	−1.1660	0.5121	0.2609	−23	−88
υ Leonis	4.5	3.21	18.9	− 0 21.6	13 22.4	− 5 34.1	−0.5511	0.5146	0.2621	+14	−77
431 B. Leonis	6.2	+3.18	−18.4	− 1 58.3	14 6.9	− 4 50.9	+0.9386	0.5149	−0.2622	+88	+ 6

DECEMBER.

78 B. Virginis	6.5	+2.99	−18.5	− 5 15.1	1 8 0.0	−11 30.8	−0.3453	0.5242	−0.2609	+25	−62
q Virginis	5.3	2.90	17.9	8 59.3	17 26.0	− 2 22.6	+1.0489	0.5305	0.2574	+81	+15
χ Virginis	4.8	2.88	18.5	7 32.0	20 2.4	+ 0 8.7	−1.1105	0.5326	0.2561	−20	−90
370 B. Virginis	6.0	+2.83	−17.7	−11 11.6	2 3 6.3	+ 6 58.7	+0.8317	0.5383	−0.2517	+79	+ 1

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x′	y′	N.	S.
		s	″	° ′	d h m	h m				°	°
ψ Virginis	5.0	+2.83	−18.3	− 9 5.0	2 3 7.5	+ 6 59.8	−1.3223	0.5383	−0.2516	−41	−86
75 Virginis	5.6	2.70	17.0	14 55.8	20 29.5	− 0 13.7	+0.3670	0.5542	0.2349	+58	−23
83 Virginis	5.6	2.69	16.8	15 45.4	3 1 32.5	+ 4 38.6	+0.0265	0.5592	0.2283	+38	−42
85 Virginis	6.1	2.68	16.9	15 20.7	2 0.9	+ 5 6.0	−0.4938	0.5597	0.2277	+11	−74
43 H. Virginis	5.5	2.63	16.1	17 48.5	14 32.1	− 6 50.5	−0.7577	0.5727	0.2076	− 6	−90
231 G. Virginis	6.4	+2.64	−15.9	−18 11.7	15 12.8	− 6 11.3	−0.5132	0.5735	−0.2064	+ 8	−70
236 G. Virginis	5.7	2.63	15.9	18 19.6	15 51.5	− 5 34.1	−0.5149	0.5741	0.2052	+ 8	−70
9 G. Libræ	6.5	2.63	15.4	20 4.3	22 23.7	+ 0 43.1	−0.0814	0.5811	−0.1924	+28	−47
				NEW	*MOON.*						
189 B. Sagittarii	6.1	+3.05	− 1.2	−24 47.5	8 1 25.3	− 0 32.1	−0.0505	0.6057	+0.1160	+22	−40
ψ Sagittarii	4.9	3.08	0.9	25 24.3	4 6.9	+ 2 2.7	+0.8771	0.6034	0.1239	+65	+ 8
208 B. Sagittarii	6.1	3.07	− 0.7	24 19.5	4 8.0	+ 2 3.8	−0.1844	0.6034	0.1240	+15	−54
χ Sagittarii	4.9	3.10	0.0	24 40.5	7 46.0	+ 5 32.6	+0.6297	0.6001	0.1343	+62	− 8
49 Sagittarii	5.5	3.08	+ 0.2	24 7.8	7 51.5	+ 5 37.9	+0.1044	0.6000	0.1345	+32	−37
53 Sagittarii	6.3	+3.12	+ 1.3	−23 37.3	13 18.1	+10 51.0	+0.3753	0.5948	+0.1491	+48	−22
274 B. Sagittarii	6.1	3.12	1.4	23 37.4	13 24.8	+10 57.4	+0.3946	0.5947	0.1494	+50	−21
329 B. Sagittarii	6.1	3.18	3.1	22 58.2	21 41.1	− 5 6.2	+1.0718	0.5862	0.1698	+67	+21
336 B. Sagittarii	6.5	3.18	3.4	22 50.0	22 36.7	− 4 12.9	+1.0944	0.5852	0.1720	+67	+23
σ Capricorni	5.5	3.15	5.3	19 23.0	9 4 54.5	+ 1 50.2	−1.2138	0.5785	0.1858	−41	−90
ο Capricorni	5.6	+3.18	+ 6.2	−18 51.8	9 11.5	+ 5 57.3	−0.9204	0.5739	+0.1944	−17	−90
υ Capricorni	5.3	3.21	7.2	18 26.2	13 23.9	+10 0.2	−0.5148	0.5694	0.2023	+ 7	−70
81 B. Capricorni	6.4	3.24	7.9	18 20.9	17 18.1	−10 14.3	+0.1990	0.5652	0.2092	+45	−32
19 Capricorni	5.7	3.26	8.4	18 14.6	19 37.3	− 8 0.2	+0.5846	0.5628	0.2130	+67	−11
94 B. Capricorni	5.7	3.24	9.2	16 21.4	20 52.2	− 6 48.0	−1.0474	0.5614	0.2150	−22	−90
21 Capricorni	6.5	+3.27	+ 9.0	−17 51.6	22 13.5	− 5 29.5	+0.7598	0.5600	+0.2170	+72	− 2
θ Capricorni	4.2	3.29	9.4	17 34.1	10 0 25.3	− 3 22.4	+0.9474	0.5578	0.2203	+72	+10
Uranus	6.0	. . .	. . .	17 37.9	0 34.5	− 3 13.6	+1.0443	0.5561	0.2201	+72	+17
29 Capricorni	5.5	3.28	10.8	15 31.3	4 44.0	+ 0 47.1	−0.1561	0.5534	0.2263	+29	−52
λ Capricorni	5.5	3.33	14.3	11 45.3	18 40.0	− 9 45.5	−0.7204	0.5402	0.2419	+ 2	−90
151 B. Capricorni	6.1	+3.37	+14.1	−13 6.9	20 6.9	− 8 21.5	+1.0213	0.5390	+0.2433	+77	+14
96 B. Aquarii	6.5	3.34	15.1	10 42.5	21 57.5	− 6 34.6	−0.9906	0.5373	0.2449	−14	−90
θ Aquarii	4.3	3.41	17.4	8 12.1	11 8 59.9	+ 4 6.3	−0.8216	0.5285	0.2526	− 2	−90
150 B. Aquarii	6.0	3.42	17.0	9 27.6	9 1.1	+ 4 7.5	+0.4793	0.5285	0.2527	+69	−18
ρ Aquarii	5.3	3.42	17.6	8 14.6	10 37.8	+ 5 41.0	−0.3668	0.5274	0.2536	+23	−64
170 B. Aquarii	6.0	+3.43	+18.1	− 7 37.2	12 15.3	+ 7 15.5	−0.5991	0.5262	+0.2544	+11	−81
186 B. Aquarii	6.1	3.46	18.6	6 59.1	16 2.8	+10 55.8	−0.2889	0.5236	0.2561	+27	−59
252 B. Aquarii	5.8	3.55	20.7	5 26.1	12 3 56.7	− 1 32.2	+1.1738	0.5167	0.2595	+85	+24
197 G. Aquarii	6.3	3.56	20.8	5 15.5	5 0.6	− 0 30.2	+1.2671	0.5161	0.2597	+85	+32
6 G. Piscium	6.2	3.54	21.7	2 50.7	5 30.7	− 0 1.0	−1.1243	0.5159	0.2597	−20	−90
22 B. Piscium	6.4	+3.65	+23.9	− 0 10.1	18 25.9	−11 29.0	−0.5791	0.5105	+0.2599	+13	−70
κ Piscium	4.9	3.66	24.2	+ 0 47.8	20 11.3	− 9 46.7	−1.1411	0.5099	0.2590	−21	−80
9 Piscium	6.4	3.66	24.3	0 39.7	20 21.2	− 9 37.2	−0.9568	0.5098	0.2596	− 0	−80
16 Piscium	5.7	3.69	25.0	1 38.2	13 1 6.2	− 5 0.5	−0.7576	0.5083	0.2588	+ 3	−88
λ Piscium	4.6	3.72	24.9	1 19.1	4 3.0	− 2 8.9	+0.3407	0.5077	0.2580	+62	−20
19 Piscium	5.4	+3.74	+25.8	+ 3 1.3	6 18.9	+ 0 3.0	−0.8819	0.5072	+0.2574	− 4	−87
22 Piscium	5.8	3.78	25.7	2 27.9	9 13.6	+ 2 52.6	+0.4577	0.5066	0.2564	+70	−10
d Piscium	5.4	3.93	28.2	7 43.6	14 0 16.2	− 6 31.0	−1.3529	0.5053	0.2493	−43	−81
136 B. Piscium	6.5	4.05	28.7	8 54.0	11 6.6	+ 4 0.6	+0.0471	0.5058	0.2419	+45	−38
75 Piscium	6.3	4.24	29.9	12 30.5	15 0 22.3	− 7 6.7	−0.7202	0.5078	0.2306	+ 5	−77
η Piscium	3.7	+4.42	+30.0	+14 55.0	13 16.6	+ 5 24.9	−0.4494	0.5112	+0.2170	+19	−63
101 Piscium	6.2	4.45	29.7	14 14.1	15 29.4	+ 7 33.7	+0.7705	0.5119	0.2144	+90	+ 3
105 Piscium	6.1	4.50	30.1	15 59.0	17 28.6	+ 9 29.4	−0.7130	0.5126	0.2120	+ 5	−74
3 Arietis	6.4	4.56	30.2	16 59.8	21 0.1	−11 5.4	−1.0804	0.5138	0.2176	−19	−73
4 Arietis	5.8	4.56	30.0	16 32.5	21 49.1	−10 17.8	−0.4144	0.5141	0.2066	+21	−59
ι Arietis	5.1	+4.64	+29.8	+17 24.7	16 2 28.2	− 5 47.2	−0.4202	0.5158	+0.2005	+20	−58

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.					Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0.		Apparent Declination.	Washington Mean Time.	Hour Angle, H	Y	x'	y'	N.	S.
		Δα	Δδ								
		s	″	° ′	d h m	h m				°	°
5 B. Arietis	6.4	+4.69	+29.6	+17 51.2	16 5 40.8	− 2 40.4	−0.2683	0.5170	+0.1960	+28	−50
7 B. Arietis	6.5	4.71	29.4	17 38.0	7 43.4	− 0 41.5	+0.3710	0.5178	0.1932	+65	−16
5 Arietis	5.9	4.76	29.6	19 6.5	9 8.5	+ 0 41.0	−0.9747	0.5184	0.1911	−13	−71
θ Arietis	5.6	4.82	29.4	19 31.0	12 53.5	+ 4 19.1	−0.7178	0.5199	0.1855	+ 4	−70
6 Arietis	6.2	4.91	28.6	19 29.2	19 5.9	+10 20.0	+0.4370	0.5226	0.1759	+70	−10
ν Arietis	5.4	+5.01	+28.5	+21 36.1	23 6.3	− 9 47.0	−1.2012	0.5244	+0.1694	−33	−68
μ Arietis	5.7	4.99	27.8	19 39.5	17 0 51.9	− 8 4.7	+1.2370	0.5252	0.1664	+89	+44
ε Arietis (*mean*)	4.6	5.14	26.9	21 0.5	9 2.5	− 0 9.4	+1.0522	0.5289	0.1521	+90	+29
54 Arietis	5.8	5.39	25.4	24 25.9	21 0.1	+11 25.2	−1.0447	0.5341	0.1295	−20	−65
7 Tauri	5.9	5.45	24.4	24 11.2	18 1 47.6	− 7 56.7	−0.1771	0.5361	0.1199	+33	−36
11 Tauri	6.1	+5.52	+23.9	+25 3.7	4 45.2	− 5 4.9	−0.8010	0.5373	+0.1139	− 3	−65
16 Tauri	5.4	5.51	23.2	24 1.8	6 39.4	− 3 14.4	+0.5565	0.5380	0.1099	+81	+ 4
17 Tauri	3.8	5.50	23.2	23 51.2	6 41.6	− 3 12.3	+0.7556	0.5380	0.1098	+90	+15
18 Tauri	5.6	5.53	23.3	24 34.8	6 48.9	− 3 5.3	−0.0364	0.5381	0.1096	+41	−27
q Tauri	4.3	5.52	23.2	24 12.5	6 50.5	− 3 3.7	+0.3788	0.5381	0.1095	+67	− 6
20 Tauri	4.1	+5.52	+23.2	+24 6.6	7 8.0	− 2 46.8	+0.5199	0.5382	+0.1089	+78	+ 2
21 Tauri	5.8	5.52	23.2	24 17.8	7 10.1	− 2 44.7	+0.3164	0.5382	0.1088	+62	− 9
22 Tauri	6.5	5.52	23.2	24 16.2	7 14.1	− 2 40.9	+0.3529	0.5383	0.1087	+65	− 7
23 Tauri	4.3	5.51	23.0	23 41.4	7 22.4	− 2 32.9	+1.0101	0.5383	0.1084	+90	+31
η Tauri	3.0	5.52	22.9	23 51.0	7 54.7	− 2 1.6	+0.8923	0.5385	0.1072	+90	+23
27 Tauri	3.7	+5.52	+22.8	+23 48.0	8 41.7	− 1 16.2	+1.0299	0.5388	+0.1056	+90	+33
28 Tauri	5.2	5.53	22.8	23 53.0	8 42.3	− 1 15.6	+0.9383	0.5388	0.1056	+90	+26
14 H. Tauri	5.3	5.58	22.8	25 19.8	9 12.5	− 0 46.4	−0.6122	0.5390	0.1045	+ 8	−60
p Tauri	5.6	5.73	20.7	26 [illegible]5.9	18 42.1	+ 8 24.4	−0.7560	0.5423	0.0839	− 1	−64
χ Tauri	5.3	5.76	19.2	25 26.1	19 0 6.7	−10 21.9	+0.5876	0.5440	0.0717	+85	+ 9
17 B. Aurigæ	6.0	+5.98	+15.7	+27 45.6	13 50.0	+ 2 53.5	−1.2303	0.5471	+0.0398	−45	−62
38 B. Aurigæ	6.5	6.02	14.0	27 34.9	19 12.2	+ 8 4.9	−0.8523	0.5479	0.0271	− 8	−62
47 B. Aurigæ	6.0	6.06	13.4	27 55.7	21 30.6	+10 18.5	−1.1809	0.5481	0.0216	−37	−62
354 B. Tauri	6.4	6.08	11.8	27 52.5	20 2 35.5	− 8 47.1	−1.0440	0.5485	+0.0094	−23	−62
107 B. Aurigæ	6.5	6.11	9.6	27 36.6	9 20.6	− 2 15.8	−0.7408	0.5486	−0.0069	0	−62
112 B. Aurigæ	5.7	+6.08	+ 9.4	+26 52.5	9 54.4	− 1 43.1	+0.0732	0.5485	−0.0082	+47	−11
125 Tauri	5.1	6.04	9.1	25 51.2	11 5.7	− 0 34.3	+1.1983	0.5485	0.0111	+86	+56
406 B. Tauri	5.6	6.16	7.5	27 56.7	16 8.1	+ 4 17.9	−1.2158	0.5482	0.0232	−43	−62
136 Tauri	4.6	6.14	7.2	27 35.7	17 12.6	+ 5 20.1	−0.8522	0.5481	0.0257	− 8	−62
139 Tauri	4.7	6.07	6.5	25 56.8	19 21.2	+ 7 24.4	+0.9210	0.5479	0.0309	+90	+33
415 B. Tauri	6.1	+6.16	+ 6.0	+27 34.2	20 41.4	+ 8 41.8	−0.9289	0.5477	−0.0341	−13	−62
ε Geminorum	3.2	6.05	− 0.3	25 13.0	21 16 19.6	+ 3 40.2	+0.5672	0.5435	0.0797	+83	+ 7
37 Geminorum	5.7	6.05	2.0	25 28.9	21 34.8	+ 8 44.9	−0.1777	0.5418	0.0913	+33	−33
39 Geminorum	6.2	6.07	2.5	26 11.6	23 11.3	+10 18.1	−1.1159	0.5413	0.0948	−28	−64
40 Geminorum	6.3	6.07	2.6	26 1.8	23 29.8	+10 36.1	−0.9641	0.5412	0.0955	−15	−64
ω Geminorum	5.2	+5.98	− 3.0	+24 20.2	22 0 53.8	+11 57.3	+0.7789	0.5407	−0.0986	+90	+17
48 Geminorum	5.8	5.97	4.4	24 16.2	5 34.8	− 7 31.0	+0.3672	0.5390	0.1085	+66	− 6
52 Geminorum	6.1	6.00	4.9	25 1.9	6 37.3	− 6 30.5	−0.5919	0.5386	0.1107	+10	−58
A Geminorum	5.1	5.99	6.1	25 12.8	10 45.1	− 2 30.8	−1.2669	0.5369	0.1193	−47	−65
58 Geminorum	6.0	5.89	5.9	23 6.5	10 47.0	− 2 29.0	+1.0626	0.5369	0.1193	+90	+34
B. D.+23° 1744	6.4	+5.87	− 7.2	+23 4.1	15 13.4	+ 1 48.8	+0.5572	0.5351	−0.1283	+81	+ 2
187 B. Geminorum	6.3	5.86	8.4	23 12.8	19 5.6	+ 5 33.4	−0.1163	0.5334	0.1358	+36	−34
192 B. Geminorum	6.3	5.82	8.7	22 35.9	20 15.0	+ 6 40.6	+0.4068	0.5329	0.1381	+68	− 7
82 Geminorum	6.3	5.84	9.5	23 21.0	22 43.6	+ 9 4.4	−0.7722	0.5318	0.1428	− 1	−67
μ Cancri	5.5	5.71	12.0	21 49.5	23 8 3.1	− 5 53.9	−0.4982	0.5276	0.1597	+16	−58
49 B. Cancri	6.0	+5.64	−13.5	+21 0.8	14 14.3	+ 0 5.7	−0.6209	0.5248	−0.1702	+ 9	−66
NEPTUNE	7.7	. . .	. . .	19 24.5	14 59.0	+ 0 49.1	+1.0208	0.5255	0.1717	+90	+24
θ Cancri	5.5	5.47	14.5	18 22.7	19 51.2	+ 5 32.3	+1.3010	0.5222	0.1793	+81	+50
102 B. Cancri	6.5	5.50	15.8	19 58.0	24 0 12.7	+ 9 45.7	−1.2439	0.5203	0.1859	−36	−70
ε Cancri	6.3	5.50	15.9	19 50.5	0 15.4	+ 9 48.3	−1.1145	0.5203	0.1860	−23	−70
δ Cancri	4.2	+5.43	−16.3	+18 27.8	2 24.0	+11 53.1	+0.0003	0.5193	−0.1892	+43	−34

ELEMENTS FOR THE PREDICTION OF OCCULTATIONS.

DECEMBER.

The Star's					At Conjunction in R. A.						Limiting Parallels.	
Name.	Mag.	Red'ns from 1915.0. Δα	Red'ns from 1915.0. Δδ	Apparent Declination.	Washington Mean Time.		Hour Angle, *H*	*Y*	*x′*	*y′*	N.	S.
		s	″	° ′	d	h m	h m				°	°
139 B. Cancri	6.1	+5.43	−17.0	+19 8.7	**24**	5 27.0	− 9 9.5	−1.3334	0.5180	−0.1936	−50	−69
X Cancri (*var.*)	6.2	5.35	17.2	17 33.0		7 48.9	− 6 51.9	−0.0428	0.5170	0.1969	+40	−37
81 Cancri	6.4	5.16	18.4	15 20.0		16 30.2	+ 1 33.8	+0.6269	0.5135	0.2083	+85	− 5
π Cancri	5.6	5.18	18.9	15 17.4		17 59.4	+ 3 0.4	+0.3644	0.5130	0.2101	+64	−18
227 B. Cancri	6.4	5.17	19.7	15 43.6		21 5.6	+ 6 1.0	−0.7723	0.5118	0.2139	+ 1	−74
7 Leonis	6.2	+5.06	−21.0	+14 45.2	**25**	4 42.0	−10 36.0	−1.3653	0.5093	−0.2223	−50	−72
18 Leonis	5.8	4.93	21.3	12 11.8		10 13.2	− 5 14.5	+0.1806	0.5077	0.2279	+53	−30
19 Leonis	6.4	4.91	21.4	11 57.4		10 46.3	− 4 42.3	+0.3164	0.5076	0.2284	+61	−24
R Leonis (*var.*)	5–10	4.92	21.4	11 49.1		10 50.2	− 4 38.6	+0.4519	0.5076	0.2285	+70	−17
A Leonis	4.6	4.77	22.9	10 24.5		21 34.8	+ 5 47.3	−0.5236	0.5052	0.2380	+16	−71
43 Leonis	6.3	+4.62	−23.1	+ 6 58.1	**26**	5 36.7	−10 24.5	+1.2635	0.5040	−0.2439	+90	+33
48 Leonis	5.2	4.56	24.0	7 23.1		11 52.9	− 4 19.0	−0.7288	0.5035	0.2478	+ 5	−83
35 Sextantis	6.1	4.48	24.0	5 11.2		16 26.2	+ 0 6.4	+0.5029	0.5034	0.2503	+73	−17
d Leonis	5.0	4.37	24.7	4 4.0	**27**	1 35.3	+ 8 59.8	−0.6044	0.5038	0.2543	+12	−81
*p*⁴ Leonis	5.7	4.28	24.6	2 24.6		4 58.7	−11 42.7	+0.3046	0.5042	0.2554	+60	−27
75 Leonis	5.4	+4.26	−25.2	+ 2 28.3		10 26.9	− 6 24.0	−1.1602	0.5051	−0.2569	−22	−88
76 Leonis	6.0	4.24	25.1	2 6.6		11 18.7	− 5 33.6	−0.9964	0.5052	0.2571	−11	−88
359 B. Leonis	6.3	4.20	24.7	+ 0 35.5		13 37.5	− 3 18.9	+0.0252	0.5057	0.2575	+44	−42
388 B. Leonis	6.3	4.16	24.3	− 1 14.3		16 2.6	− 0 58.0	+1.3477	0.5063	0.2579	+85	+41
υ Leonis	4.5	4.12	25.0	0 21.7		20 46.7	+ 3 37.8	−0.8065	0.5076	0.2583	+ 1	−90
431 B. Leonis	6.2	+4.10	−24.5	− 1 58.4		21 32.4	+ 4 22.2	+0.7046	0.5078	−0.2584	+88	− 2
78 B. Virginis	6.5	3.91	24.3	5 15.2	**28**	15 58.1	− 1 45.0	−0.5874	0.5156	0.2560	+12	−80
q Virginis	5.3	3.81	23.5	8 59.4	**29**	1 43.0	+ 7 42.1	+0.8384	0.5213	0.2522	+81	+ 1
χ Virginis	4.8	3.79	24.1	7 32.1		4 24.7	+10 18.8	−1.3541	0.5232	0.2508	−45	−83
370 B. Virginis	6.0	3.72	22.9	11 11.7		11 43.4	− 6 36.3	+0.6291	0.5285	0.2461	+77	−10
69 Virginis	4.9	+3.61	−21.3	−15 32.3	**30**	3 15.8	+ 8 25.5	+1.3738	0.5413	−0.2320	+69	+54
75 Virginis	5.6	3.60	21.5	14 55.9		5 44.0	+10 48.7	+0.1811	0.5436	0.2292	+47	−33
83 Virginis	5.6	3.57	21.0	15 45.5		10 57.8	− 8 8.1	−0.1570	0.5486	0.2227	+29	−52
85 Virginis	6.1	3.56	21.2	15 20.8		11 27.2	− 7 39.8	−0.6854	0.5490	0.2220	+ 1	−90
87 Virginis	5.8	3.57	20.5	17 26.4		12 15.1	− 6 53.6	+1.2730	0.5498	0.2210	+73	+38
89 Virginis	5.1	+3.56	−20.4	−17 43.0		13 20.6	− 5 50.3	+1.3136	0.5509	−0.2195	+73	+44
43 H. Virginis	5.5	3.48	19.8	17 48.6	**31**	0 24.8	+ 4 50.3	−0.9314	0.5622	0.2023	−16	−90
231 G. Virginis	6.4	3.49	19.5	18 11.8		1 6.8	+ 5 30.8	−0.6818	0.5629	0.2011	− 1	−90
236 G. Virginis	5.7	3.48	19.5	18 19.7		1 46.9	+ 6 9.4	−0.6823	0.5636	0.2000	− 2	−90
9 G. Libræ	6.5	3.46	18.5	20 4.3		8 32.1	−11 20.4	−0.2297	0.5708	0.1874	+21	−56
17 G. Libræ	6.4	+3.43	−18.0	−20 49.3		13 10.1	− 6 52.9	−0.3223	0.5757	−0.1779	+15	−62
18 G. Libræ	6.1	3.43	17.8	20 58.4		13 35.4	− 6 28.6	−0.2435	0.5761	0.1771	+19	−57
43 B. Libræ	5.7	+3.48	−19.3	−21 2.3		17 39.9	− 2 33.6	−0.8810	0.5805	−0.1681	−17	−90

CCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1915.

	The Star's			Immersion.				Emersion.				Duration of Occultation.
				Washington.		Angle from—		Washington.		Angle from—		
	Name.		Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
				h m	h m	°	°	h m	h m	°	°	h m
1	*A* Geminorum		5.1	2 39	7 57	111	170	3 48	9 5	258	318	1 8
2	η Cancri		5.5	12 18	17 30	75	18	13 4	18 16	342	286	0 45
8	75 Virginis		5.6	12 32	17 20	161	175	13 35	18 23	273	271	1 3
11	τ Scorpii		2.9	14 36	19 12	167	190	15 13	19 49	226	242	0 37
19	13 Piscium		6.4	1 39	5 46	87	53	2 40	6 47	198	156	1 1
23	26 Arietis		6.2	0 33	4 25	33	79	1 51	5 42	260	281	1 17
24	7 Tauri		5.9	10 13	13 59	16	325	10 34	14 19	334	285	0 20
27	415 B. Tauri		6.1	0 44	4 19	67	126	1 48	5 23	277	338	1 4
28	39 Geminorum		6.2	1 38	5 10	109	167	2 42	6 13	252	312	1 3
28	40 Geminorum		6.3	2 20	5 52	164	223	2 40	6 12	198	258	0 20
29	9 Cancri		6.2	8 56	12 23	90	56	10 6	13 33	326	273	1 10
31	ψ Leonis		5.6	4 1	7 20	75	128	4 52	8 11	328	22	0 51
. 2	79 Leonis	†	5.5	4 50	8 2	113	164	5 46	8 57	302	353	0 55
2	υ Leonis		4.5	13 20	16 30	98	68	14 22	17 32	336	296	1 2
9	58 G. Sagittarii		6.1	14 17	17 0	103	146	15 27	18 9	264	296	1 9
23	136 Tauri		4.6	10 42	12 30	76	17	11 37	13 25	307	252	0 55
25	176 B. Geminorum		6.3	7 3	8 44	121	144	8 29	10 10	282	244	1 26
25	181 B. Geminorum		6.0	7 48	9 29	132	121	9 10	10 50	274	224	1 21
25	82 Geminorum		6.3	13 25	15 5	152	97	14 8	15 47	252	200	0 42
26	η Cancri		5.5	7 34	9 10	164	194	8 31	10 8	249	247	0 57
26	102 B. Cancri		6.5	12 13	13 48	105	49	13 14	14 50	314	258	1 1
26	ε Cancri		6.3	12 22	13 58	127	71	13 24	15 0	292	236	1 2
r. 4	83 Virginis	†	5.6	7 53	9 6	136	188	8 45	9 58	283	332	0 52
20	18 Tauri	‡	5.6	10 43	10 53	49	0	11 26	11 36	303	258	0 43
20	*q* Tauri	‡	4.3	10 52	11 2	152	104	11 14	11 23	199	154	0 21
20	21 Tauri	‡	5.8	11 0	11 9	123	75	11 42	11 51	229	186	0 42
25	9 Cancri		6.2	6 10	6 0	100	151	7 36	7 26	302	321	1 26
25	49 B. Cancri	‡	6.0	15 0	14 49	157	107	15 36	15 25	247	200	0 36
28	37 Sextantis		6.3	9 52	9 31	209	226	10 7	9 45	230	243	0 14
29	υ Leonis		4.5	10 10	9 44	164	188	11 11	10 45	275	282	1 1
31	75 Virginis		5.6	15 28	14 53	98	71	16 34	16 0	320	282	1 7
pr. 21	82 Geminorum		6.3	9 38	7 42	157	106	10 39	8 43	256	198	1 1
22	102 B. Cancri		6.5	9 10	7 10	100	79	10 26	8 26	324	278	1 16
22	ε Cancri		6.3	9 20	7 20	121	96	10 42	8 41	302	253	1 21
30	π Scorpii	†	3.0	10 56	8 24	102	151	11 53	9 21	301	344	0 57
May 5	ι Capricorni		4.3	17 21	14 29	50	94	18 33	15 40	263	297	1 11
6	*e* Aquarii		5.4	16 50	13 53	62	112	17 56	15 0	249	294	1 6
18	187 B. Geminorum	‡	6.3	14 55	11 12	129	82	15 42	11 59	267	224	0 46
21	*A* Leonis		4.6	14 32	10 38	97	44	15 27	11 32	326	273	0 54
25	75 Virginis		5.6	16 44	12 33	60	22	17 23	13 12	348	305	0 39
29	10 G. Sagittarii		5.7	19 11	14 44	22	5	19 48	15 21	322	298	0 37
June 1	20 Capricorni		6.2	16 27	11 49	112	158	17 20	12 42	210	250	0 53
2	μ Capricorni		5.2	17 18	12 36	120	167	17 58	13 16	190	233	0 40
4	13 Piscium		6.4	20 23	15 32	94	136	21 21	16 30	189	222	0 58
19	359 B. Leonis		6.3	12 44	6 55	153	128	13 54	8 6	285	246	1 10
25	43 Ophiuchi		5.4	20 17	14 3	38	4	21 4	14 50	308	267	0 47
27	51 Sagittarii		5.8	19 34	13 13	32	31	20 36	14 15	286	273	1 2
27	*h* Sagittarii		4.7	19 38	13 17	77	76	20 54	14 33	238	221	1 16
July 2	25 Piscium	†	6.2	17 2	10 22	36	87	17 52	11 12	270	322	0 50
23	10 G. Sagittarii		5.7	19 11	11 8	16	0	19 43	11 40	327	304	0 32
26	URANUS		6.0	23 43	15 28	42	10	0 47	16 31	252	210	1 4
28	252 B. Aquarii		5.8	23 49	15 26	47	31	1 5	16 41	234	202	1 16

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.

† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

E 610

OCCULTATIONS

OCCULTATIONS VISIBLE AT WASHINGTON

	Name.		
139 B.	Cancri		
X	Cancri (v		
81	Cancri		
π	Cancri		
227 B.	Cancri		
7	Leonis		
18	Leonis		
19	Leonis		
R	Leonis (*var.*		
A	Leonis		
43	Leonis		
48	Leonis		
35	Sextantis		
d	Leonis		
p^4	Leonis		
75	Leonis		
76	Leonis		
359 B.	Leonis		
388 B.	Leonis		
υ	Leonis		
431 B.	Leonis	6	
78 B.	Virginis	6.	
q	Virginis	5.	
χ	Virginis	4.	
370 B.	Virginis	6.0	
69	Virginis	4.9	
75	Virginis	5.6	
83	Virginis	5.6	
85	Virginis	6.1	
87	Virginis	5.8	
89	Virginis	5.1	+
43 H.	Virginis	5.5	3
231 G.	Virginis	6.4	3
236 G.	Virginis	5.7	3
9 G.	Libræ	6.5	3
17 G.	Libræ	6.4	+3.4
18 G.	Libræ	6.1	3.4
43 B.	Libræ	5.7	+3.4

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE SUN.

FOR WASHINGTON MEAN NOON.

e.	P	B_0	L_0	Date.	P	B_0	L_0
	°	°	°		°	°	°
1	+ 2.14	−3.13	88.24	July 5	− 1.01	+3.40	166.47
6	− 0.30	3.70	22.39	10	+ 1.26	3.92	100.29
11	2.72	4.24	316.55	15	3.51	4.41	34.13
6	5.09	4.74	250.72	20	5.72	4.87	327.97
1	7.40	5.21	184.88	25	7.87	5.30	261.82
	− 9.63	−5.64	119.05	30	+ 9.95	+5.70	195.68
	11.76	6.02	53.22	Aug. 4	11.95	6.05	129.56
	13.78	6.35	347.38	9	13.85	6.36	63.45
	15.68	6.64	281.55	14	15.65	6.63	357.35
	17.44	6.87	215.71	19	17.33	6.85	291.26
	−19.06	−7.05	149.87	24	+18.89	+7.03	225.19
	20.54	7.17	84.02	29	20.32	7.15	159.13
	21.86	7.24	18.16	Sept. 3	21.62	7.23	93.08
	23.02	7.25	312.28	8	22.78	7.25	27.05
	24.02	7.20	246.39	13	23.79	7.22	321.03
	−24.85	−7.10	180.49	18	+24.64	+7.14	255.02
	25.51	6.95	114.58	23	25.34	7.01	189.02
	25.99	6.75	48.64	28	25.87	6.82	123.03
	26.30	6.50	342.68	Oct. 3	26.23	6.58	57.06
	26.43	6.20	276.70	8	26.41	6.29	351.09
	−26.37	−5.85	210.71	13	+26.41	+5.96	285.13
	26.13	5.46	144.69	18	26.22	5.58	219.18
	25.71	5.03	78.66	23	25.84	5.15	153.23
	25.11	4.57	12.60	28	25.27	4.69	87.29
	24.32	4.08	306.52	Nov. 2	24.50	4.19	21.36
	3.35	−3.56	240.43	7	+23.54	+3.66	315.44
	2.20	3.02	174.32	12	22.38	3.10	249.52
	.88	2.45	108.19	17	21.02	2.51	183.61
	.40	1.87	42.05	22	19.48	1.90	117.70
	77	1.28	335.90	27	17.76	1.28	51.80
	99	0.68	269.73	Dec. 2	+15.88	0.65	345.90
	09	−0.08	203.56	7	13.85	+0.01	280.02
	08	+0.52	137.38	12	11.70	−0.63	214.14
	7	1.12	71.20	17	9.44	1.27	148.26
	9	1.71	5.02	22	7.09	1.90	82.39
		+2.29	298.83	27	+ 4.69	−2.51	16.53
		+2.85	232.65	32	+ 2.26	−3.10	310.68

le, P is the position-angle of the axis of rotation measured eastward from
disk, while L_0 and B_0 are the heliographic longitudes and latitudes, respec-
of the disk. The longitudes are reckoned from the Solar Meridian which
ending node of the Sun's equator on the ecliptic, on Jan. 1, 1854, Green-

OCCULTATIONS VISIBLE AT WASHINGTON DURING THE YEAR 1915.

Date.	The Star's		Immersion.				Emersion.				Duration of Occultation.
			Washington.		Angle from—		Washington.		Angle from—		
	Name.	Mag.	Sidereal Time.	Mean Time.	North Point.	Vertex.	Sidereal Time.	Mean Time.	North Point.	Vertex.	
			h m	h m	°	°	h m	h m	°	°	h m
July 28	197 G. Aquarii	6.3	1 15	16 51	95	61	2 7	17 43	192	151	0 52
Aug. 7	52 Geminorum	6.1	0 24	15 21	53	104	1 9	16 6	311	5	0 45
21	*h* Sagittarii	4.7	17 8	7 12	68	97	18 27	8 30	263	277	1 18
21	51 Sagittarii	5.8	17 12	7 15	18	46	17 51	7 54	316	337	0 39
23	42 Capricorni	5.1	0 3	13 57	90	58	0 58	14 52	201	161	0 55
28	101 Piscium	6.2	20 25	10 0	343	35	20 35	10 10	322	15	0 10
29	26 Arietis	6.2	23 56	13 26	67	119	1 16	14 47	228	263	1 21
Sept. 4	82 Geminorum	6.3	1 58	15 4	48	103	2 40	15 47	326	23	0 42
18	4 Capricorni	5.7	19 20	7 32	12	23	20 8	8 20	300	301	0 48
21	197 G. Aquarii	6.3	21 38	9 39	18	38	22 45	10 45	264	267	1 7
27	16 Tauri	5.4	20 54	8 31	65	115	21 49	9 26	256	310	0 55
27	17 Tauri	3.8	20 54	8 31	107	158	21 39	9 16	213	267	0 45
27	*q* Tauri	4.3	21 16	8 53	30	82	22 0	9 36	290	345	0 43
27	20 Tauri	4.1	21 21	8 58	66	118	22 18	9 55	253	310	0 58
27	22 Tauri	6.5	21 38	9 15	32	85	22 25	10 2	287	344	0 46
27	21 Tauri	5.8	21 40	9 17	20	74	22 18	9 55	298	355	0 38
29	112 B. Aurigæ	5.7	0 9	11 38	99	156	1 12	12 41	241	302	1 3
Oct. 2	49 B. Cancri	6.0	3 28	14 44	84	141	4 37	15 53	303	0	1 9
13	10 G. Sagittarii	5.7	18 56	5 30	91	77	20 12	6 46	251	223	1 16
15	329 B. Sagittarii	6.1	20 2	6 28	0	359	20 35	7 2	311	302	0 34
15	336 B. Sagittarii	6.5	21 6	7 32	35	20	22 14	8 40	270	242	1 8
16	URANUS	6.0	23 10	9 32	28	0	0 13	10 35	265	227	1 3
16	θ Capricorni ‡	4.2	1 4	11 26	62	19	2 4	12 26	238	188	1 0
25	χ Tauri	5.3	23 40	9 26	107	166	0 36	10 22	215	274	0 56
30	δ Cancri	4.2	1 44	11 11	134	184	2 34	12 0	251	304	0 49
30	*X* Cancri (*var.*)	6.2	8 22	17 48	140	155	9 46	19 11	284	257	1 24
Nov. 18	101 Piscium	6.2	0 30	8 42	80	106	1 48	10 0	210	202	1 18
19	26 Arietis	6.2	5 37	13 44	88	33	6 51	14 58	240	184	1 14
24	ε Geminorum	3.2	0 40	8 28	148	202	1 12	9 0	210	266	0 32
25	187 B. Geminorum	6.3	3 35	11 19	51	110	4 28	12 11	328	26	0 53
27	π Cancri	5.6	2 39	10 15	174	224	3 1	10 37	218	270	0 22
Dec. 8	ψ Sagittarii	4.9	21 33	4 27	107	78	22 25	5 18	209	172	0 52
11	150 B. Aquarii ‡	6.0	3 17	9 58	105	56	3 57	10 38	196	144	0 40
13	22 Piscium	5.8	3 25	9 58	99	52	4 17	10 50	200	150	0 52
14	136 B. Piscium	6.5	5 54	12 23	28	335	6 42	13 11	285	233	0 48
16	47 B. Arietis	6.5	0 21	6 43	42	84	1 44	8 5	252	263	1 22
18	17 Tauri	3.8	22 32	4 46	99	156	23 28	5 42	217	276	0 56
18	16 Tauri	5.4	22 34	4 48	58	115	23 38	5 52	258	317	1 4
18	*q* Tauri	4.3	23 3	5 17	23	81	23 50	6 5	292	351	0 48
18	20 Tauri	4.1	23 5	5 20	61	120	0 14	6 28	254	313	1 8
18	22 Tauri	6.5	23 28	5 42	28	87	0 22	6 36	286	346	0 54
18	21 Tauri	5.8	23 30	5 44	16	75	0 13	6 27	299	358	0 43
20	112 B. Aurigæ	5.7	2 31	8 37	34	95	3 26	9 32	311	9	0 55
21	ε Geminorum	3.2	11 10	17 11	103	44	12 13	18 13	294	238	1 2
22	B. D.+23° 1744	6.4	9 43	15 40	132	78	10 57	16 54	279	220	1 14
24	81 Cancri	6.4	10 58	16 47	124	83	12 15	18 4	305	253	1 17
25	18 Leonis †	5.8	2 27	8 13	84	132	3 19	9 5	313	4	0 51
25	19 Leonis †	6.4	3 1	8 47	118	169	3 59	9 45	281	334	0 58
25	*R* Leonis (*var.*)	5–10	3 16	9 2	149	200	4 2	9 48	251	304	0 46
26	35 Sextantis	6.1	10 2	15 43	119	132	11 24	17 5	321	305	1 22
27	359 B. Leonis	6.3	5 56	11 34	76	127	6 42	12 20	344	34	0 46

NOTE.—The angles of position are counted from the north point and vertex of the Moon's limb toward the east.

† Immersion below the horizon of Washington.
‡ Emersion below the horizon of Washington.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE SUN.

FOR WASHINGTON MEAN NOON.

Date.	P	B_0	L_0	Date.	P	B_0	L_0
	°	°	°		°	°	°
Jan. 1	+ 2.14	−3.13	88.24	July 5	− 1.01	+3.40	166.47
6	− 0.30	3.70	22.39	10	+ 1.26	3.92	100.29
11	2.72	4.24	316.55	15	3.51	4.41	34.13
16	5.09	4.74	250.72	20	5.72	4.87	327.97
21	7.40	5.21	184.88	25	7.87	5.30	261.82
26	− 9.63	−5.64	119.05	30	+ 9.95	+5.70	195.68
31	11.76	6.02	53.22	Aug. 4	11.95	6.05	129.56
Feb. 5	13.78	6.35	347.38	9	13.85	6.36	63.45
10	15.68	6.64	281.55	14	15.65	6.63	357.35
15	17.44	6.87	215.71	19	17.33	6.85	291.26
20	−19.06	−7.05	149.87	24	+18.89	+7.03	225.19
25	20.54	7.17	84.02	29	20.32	7.15	159.13
Mar. 2	21.86	7.24	18.16	Sept. 3	21.62	7.23	93.08
7	23.02	7.25	312.28	8	22.78	7.25	27.05
12	24.02	7.20	246.39	13	23.79	7.22	321.03
17	−24.85	−7.10	180.49	18	+24.64	+7.14	255.02
22	25.51	6.95	114.58	23	25.34	7.01	189.02
27	25.99	6.75	48.64	28	25.87	6.82	123.03
Apr. 1	26.30	6.50	342.68	Oct. 3	26.23	6.58	57.06
6	26.43	6.20	276.70	8	26.41	6.29	351.09
11	−26.37	−5.85	210.71	13	+26.41	+5.96	285.13
16	26.13	5.46	144.69	18	26.22	5.58	219.18
21	25.71	5.03	78.66	23	25.84	5.15	153.23
26	25.11	4.57	12.60	28	25.27	4.69	87.29
May 1	24.32	4.08	306.52	Nov. 2	24.50	4.19	21.36
6	−23.35	−3.56	240.43	7	+23.54	+3.66	315.44
11	22.20	3.02	174.32	12	22.38	3.10	249.52
16	20.88	2.45	108.19	17	21.02	2.51	183.61
21	19.40	1.87	42.05	22	19.48	1.90	117.70
26	17.77	1.28	335.90	27	17.76	1.28	51.80
31	−15.99	0.68	269.73	Dec. 2	+15.88	0.65	345.90
June 5	14.09	−0.08	203.56	7	13.85	+0.01	280.02
10	12.08	+0.52	137.38	12	11.70	−0.63	214.14
15	9.97	1.12	71.20	17	9.44	1.27	148.26
20	7.79	1.71	5.02	22	7.09	1.90	82.39
25	− 5.56	+2.29	298.83	27	+ 4.69	−2.51	16.53
30	− 3.29	+2.85	232.65	32	+ 2.26	−3.10	310.68

In the above table, P is the position-angle of the axis of rotation measured eastward from the north point of the disk, while L_0 and B_0 are the heliographic longitudes and latitudes, respectively, of the center of the disk. The longitudes are reckoned from the Solar Meridian which passed through the ascending node of the Sun's equator on the ecliptic, on Jan. 1, 1854, Greenwich Mean Noon.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR WASHINGTON MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		*C*
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Jan.	1	−4.44	−4.22	−0.01	−0.04	102.58	−1.19	7.00
	2	4.89	2.97	0.01	0.04	114.71	1.16	11.63
	3	5.17	1.55	0.01	0.04	126.84	1.13	15.54
	4	5.26	−0.03	0.01	0.04	138.97	1.10	18.59
	5	5.16	+1.52	0.01	0.04	151.11	1.07	20.74
	6	−4.85	+3.00	−0.01	−0.04	163.25	−1.04	21.96
	7	4.29	4.34	−0.01	0.04	175.40	1.01	22.17
	8	3.48	5.44	0.00	0.04	187.56	0.98	21.27
	9	2.44	6.22	0.00	0.04	199.72	0.95	19.14
	10	−1.19	6.63	0.00	0.04	211.89	0.92	15.66
	11	+0.21	+6.61	0.00	−0.04	224.07	−0.89	10.87
	12	1.64	6.16	0.00	0.04	236.25	0.87	5.11
	13	3.90	5.32	0.00	0.04	248.44	0.84	358.94
	14	4.18	4.15	0.00	0.04	260.63	0.82	353.06
	15	5.07	2.74	0.00	0.04	272.82	0.80	347.97
	16	+5.61	+1.19	0.00	−0.04	285.01	−0.78	343.94
	17	5.77	−0.38	0.00	0.04	297.20	0.76	340.97
	18	5.55	1.90	0.00	0.04	309.38	0.74	339.02
	19	4.98	3.28	0.00	0.04	321.56	0.73	337.98
	20	4.12	4.47	0.00	0.04	333.74	0.71	337.81
	21	+3.05	−5.45	−0.01	−0.04	345.91	−0.70	338.49
	22	1.83	6.18	0.01	0.04	358.07	0.68	340.04
	23	+0.55	6.64	0.01	0.04	10.23	0.67	342.48
	24	−0.71	6.81	0.01	0.04	22.38	0.65	345.82
	25	1.90	6.70	0.01	0.04	34.53	0.63	349.99
	26	−2.94	−6.29	−0.01	−0.04	46.67	−0.61	354.84
	27	3.79	5.58	0.01	0.04	58.81	0.59	0.07
	28	4.42	4.60	0.01	0.04	70.94	0.56	5.30
	29	4.80	3.37	0.01	0.04	83.07	0.53	10.18
	30	4.94	1.94	0.01	0.04	95.20	0.50	14.40
	31	−4.84	−0.38	−0.01	−0.04	107.33	−0.46	17.79
Feb.	1	4.51	+1.22	0.01	0.04	119.47	0.43	20.26
	2	3.97	2.78	0.01	0.04	131.60	0.39	21.76
	3	3.26	4.19	0.01	0.04	143.74	0.35	22.24
	4	2.40	5.36	0.01	0.04	155.89	0.31	21.61
	5	−1.43	+6.21	−0.01	−0.04	168.04	−0.28	19.78
	6	−0.39	6.68	0.01	0.04	180.20	0.24	16.65
	7	+0.67	6.75	0.01	0.04	192.37	0.20	12.27
	8	1.71	6.40	0.01	0.04	204.54	0.17	6.86
	9	2.68	5.67	0.01	0.04	216.72	0.14	0.91
	10	+3.52	+4.59	−0.01	−0.04	228.91	−0.11	355.03
	11	4.19	3.26	0.01	0.04	241.10	0.08	349.74
	12	4.64	1.76	0.01	0.04	253.30	0.05	345.36
	13	4.83	+0.18	0.01	0.04	265.50	−0.02	342.01
	14	4.75	−1.38	0.01	0.04	277.69	0.00	339.66
	15	+4.39	−2.84	−0.01	−0.04	289.89	+0.03	338.26
	16	+3.77	−4.13	−0.01	−0.04	302.09	+0.05	337.75

MERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR WASHINGTON MEAN MIDNIGHT.

	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		*C*
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
	+3.77	−4.13	−0.01	−0.04	302.09	+0.05	337.75
	2.92	5.20	0.01	0.04	314.28	0.07	338.12
	1.87	6.02	0.01	0.04	326.47	0.09	339.36
	+0.69	6.57	0.01	0.04	338.65	0.11	341.49
	−0.57	6.84	0.01	0.04	350.83	0.12	344.52
1	−1.84	−6.81	−0.02	−0.04	3.00	+0.14	348.41
2	3.03	6.49	0.02	0.04	15.17	0.17	353.02
3	4.09	5.87	0.02	0.04	27.33	0.19	358.10
24	4.93	4.99	0.02	0.04	39.48	0.21	3.33
25	5.51	3.85	0.02	0.04	51.63	0.23	8.35
26	−5.77	−2.49	−0.02	−0.04	63.78	+0.26	12.85
27	5.69	−0.96	0.02	0.04	75.92	0.29	16.60
28	5.26	+0.66	0.02	0.04	88.06	0.32	19.46
1	4.51	2.28	0.02	0.04	100.20	0.35	21.36
2	3.48	3.78	0.02	0.04	112.35	0.39	22.22
3	−2.26	+5.06	−0.02	−0.04	124.49	+0.43	21.94
4	−0.93	6.02	0.02	0.04	136.64	0.46	20.42
5	+0.41	6.59	0.02	0.04	148.80	0.50	17.56
6	1.67	6.74	0.02	0.04	160.96	0.53	13.40
7	2.78	6.48	0.01	0.04	173.13	0.56	8.17
8	+3.69	+5.82	−0.01	−0.04	185.30	+0.59	2.32
9	4.37	4.82	0.01	0.04	197.49	0.63	356.44
10	4.81	3.57	0.01	0.04	209.68	0.66	351.06
11	5.03	2.14	0.01	0.04	221.88	0.69	346.51
12	5.02	+0.61	0.01	0.04	234.08	0.71	342.92
13	+4.80	−0.93	−0.01	−0.04	246.29	+0.74	340.30
14	4.38	2.39	0.01	0.04	258.50	0.76	338.60
15	3.77	3.72	0.01	0.04	270.71	0.79	337.80
16	2.99	4.85	0.01	0.04	282.92	0.81	337.87
17	2.05	5.74	0.01	0.04	295.13	0.83	338.81
18	+0.96	−6.36	−0.02	−0.04	307.34	+0.85	340.65
19	−0.24	6.70	0.02	0.04	319.54	0.86	343.40
20	1.51	6.75	0.02	0.04	331.74	0.87	347.02
21	2.79	6.51	0.02	0.04	343.94	0.89	351.38
22	4.02	6.00	0.02	0.04	356.13	0.90	356.29
23	−5.13	−5.21	−0.02	−0.04	8.32	+0.92	1.43
24	6.04	4.18	0.02	0.04	20.50	0.93	6.48
25	6.67	2.92	0.02	0.04	32.67	0.95	11.13
26	6.94	−1.49	0.02	0.04	44.84	0.97	15.15
27	6.81	+0.07	0.02	0.04	57.00	0.99	18.37
28	−6.23	+1.67	−0.02	−0.04	69.16	+1.01	20.69
29	5.22	3.21	0.02	0.04	81.32	1.03	22.02
30	3.82	4.58	0.02	0.04	93.48	1.06	22.23
31	2.15	5.66	0.02	0.04	105.63	1.08	21.17
Apr. 1	−0.34	6.36	0.02	0.04	117.79	1.10	18.72
2	+1.45	+6.62	−0.02	−0.04	129.95	+1.13	14.84
3	+3.07	+6.44	−0.02	−0.04	142.12	+1.15	0.73

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR WASHINGTON MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		*C*
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Apr.	1	−0.34	+6.36	−0.02	−0.04	117.79	+1.10	18.72
	2	+1.45	6.62	0.02	0.04	129.95	1.13	14.84
	3	3.07	6.44	0.02	0.04	142.12	1.15	9.73
	4	4.40	5.85	0.02	0.04	154.29	1.18	3.84
	5	5.39	4.90	0.02	0.04	166.47	1.20	357.82
	6	+6.00	+3.69	−0.01	−0.04	178.66	+1.22	352.24
	7	6.26	2.30	0.01	0.04	190.86	1.24	347.48
	8	6.21	+0.81	0.01	0.04	203.06	1.26	343.68
	9	5.88	−0.69	0.01	0.04	215.27	1.28	340.86
	10	5.34	2.13	0.01	0.04	227.49	1.30	338.95
	11	+4.62	−3.44	−0.01	−0.04	239.71	+1.32	337.91
	12	3.76	4.57	0.01	0.04	251.94	1.34	337.73
	13	2.77	5.48	0.01	0.04	264.16	1.36	338.41
	14	1.69	6.14	0.01	0.04	276.39	1.37	339.99
	15	+0.51	6.52	0.01	0.04	288.62	1.38	342.48
	16	−0.73	−6.62	−0.02	−0.04	300.84	+1.39	345.85
	17	2.02	6.43	0.02	0.04	313.07	1.39	350.02
	18	3.32	5.97	0.02	0.04	325.29	1.40	354.77
	19	4.58	5.25	0.02	0.04	337.50	1.40	359.83
	20	5.73	4.29	0.02	0.04	349.71	1.41	4.87
	21	−6.70	−3.12	−0.02	−0.04	1.92	+1.41	9.59
	22	7.41	1.78	0.02	0.04	14.12	1.41	13.75
	23	7.77	−0.31	0.02	0.04	26.31	1.42	17.21
	24	7.70	+1.22	0.02	0.04	38.49	1.43	19.85
	25	7.15	2.72	0.02	0.04	50.67	1.43	21.59
	26	−6.09	+4.11	−0.02	−0.04	62.85	+1.44	22.31
	27	4.57	5.27	0.02	0.04	75.02	1.45	21.86
	28	2.68	6.08	0.02	0.04	87.19	1.46	20.01
	29	−0.57	6.48	0.01	0.04	99.36	1.47	16.66
	30	+1.55	6.42	0.01	0.04	111.54	1.47	11.88
May	1	+3.50	+5.90	−0.01	−0.04	123.72	+1.48	6.02
	2	5.11	5.00	0.01	0.04	135.90	1.49	359.76
	3	6.29	3.80	0.01	0.04	148.08	1.50	353.81
	4	7.01	2.40	0.01	0.04	160.28	1.50	348.67
	5	7.28	+0.90	0.01	0.04	172.48	1.51	344.54
	6	+7.15	−0.60	−0.01	−0.04	184.69	+1.52	341.44
	7	6.70	2.04	0.01	0.04	196.90	1.53	339.30
	8	5.98	3.35	0.01	0.04	209.12	1.54	338.06
	9	5.08	4.48	0.01	0.04	221.35	1.55	337.67
	10	4.04	5.39	0.01	0.04	233.59	1.55	338.13
	11	+2.90	−6.05	−0.01	−0.04	245.82	+1.56	339.47
	12	1.69	6.45	0.01	0.04	258.06	1.56	341.72
	13	+0.44	6.56	0.01	0.04	270.30	1.56	344.87
	14	−0.84	6.39	0.01	0.04	282.54	1.56	348.85
	15	2.13	5.95	0.01	0.04	294.78	1.56	353.48
	16	−3.41	−5.25	−0.01	−0.04	307.02	+1.56	358.49
	17	−4.63	−4.31	−0.01	−0.04	319.25	+1.55	3.54

MERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR WASHINGTON MEAN MIDNIGHT.

		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
		−4.63	−4.31	−0.01	−0.04	319.25	+1.55	3.54
		5.76	3.18	0.01	0.04	331.49	1.54	8.33
		6.73	1.88	0.01	0.04	343.72	1.53	12.60
		7.46	−0.47	0.01	0.04	355.94	1.52	16.21
		7.88	+1.00	0.01	0.04	8.15	1.51	19.06
		−7.90	+2.46	−0.01	−0.04	20.36	+1.51	21.08
	3	7.46	3.83	0.01	0.04	32.56	1.50	22.18
	4	6.51	5.01	0.01	0.04	44.76	1.49	22.23
	5	5.08	5.90	0.01	0.04	56.95	1.48	21.04
	6	3.24	6.42	0.01	0.04	69.13	1.47	18.41
	27	−1.12	+6.49	−0.01	−0.04	81.32	+1.46	14.25
	28	+1.08	6.10	0.01	0.04	93.50	1.45	8.74
	29	3.16	5.27	−0.01	0.04	105.68	1.44	2.44
	30	4.93	4.08	0.00	0.04	117.87	1.43	356.12
	31	6.29	2.66	0.00	0.04	130.06	1.43	350.45
	1	+7.16	+1.11	0.00	−0.04	142.26	+1.42	345.81
	2	7.54	−0.45	0.00	0.04	154.46	1.41	342.28
	3	7.48	1.94	0.00	0.04	166.67	1.40	339.80
	4	7.05	3.30	0.00	0.04	178.89	1.40	338.28
	5	6.31	4.46	0.00	0.04	191.11	1.40	337.65
	6	+5.35	−5.40	0.00	−0.04	203.34	+1.39	337.89
	7	4.23	6.08	0.00	0.04	215.57	1.39	339.01
	8	3.01	6.50	0.00	0.04	227.81	1.39	341.03
	9	1.74	6.63	0.00	0.04	240.06	1.38	343.96
	10	+0.45	6.48	0.00	0.04	252.31	1.37	347.75
	11	−0.83	−6.04	0.00	−0.04	264.56	+1.36	352.25
	12	2.08	5.35	−0.01	0.04	276.81	1.35	357.21
	13	3.28	4.42	0.01	0.04	289.06	1.34	2.31
	14	4.39	3.28	0.01	0.04	301.31	1.32	7.20
	15	5.40	1.98	0.01	0.04	313.55	1.30	11.62
	16	−6.24	−0.57	−0.01	−0.04	325.79	+1.28	15.38
	17	6.88	+0.90	−0.01	0.04	338.03	1.27	18.40
	18	7.24	2.35	0.00	0.04	350.26	1.25	20.62
	19	7.25	3.71	0.00	0.04	2.49	1.22	21.98
	20	6.87	4.90	0.00	0.04	14.71	1.20	22.37
	21	−6.06	+5.83	0.00	−0.04	26.92	+1.18	21.66
	22	4.83	6.43	0.00	0.04	39.12	1.16	19.66
	23	3.23	6.63	0.00	0.04	51.32	1.13	16.20
	24	−1.35	6.37	0.00	0.04	63.51	1.11	11.32
	25	+0.64	5.67	0.00	0.04	75.70	1.09	5.33
	26	+2.57	+4.57	0.00	−0.04	87.89	+1.06	358.91
	27	4.28	3.17	0.00	0.04	100.08	1.04	352.82
	28	5.65	+1.58	0.00	0.04	112.27	1.01	347.61
	29	6.59	−0.06	0.00	0.04	124.47	0.99	343.53
	30	7.08	1.65	0.00	0.04	136.67	0.97	340.57
July	1	+7.12	−3.11	+0.01	−0.04	148.88	+0.95	338.67
	2	+6.77	−4.36	+0.01	−0.04	161.09	+0.94	337.72

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR WASHINGTON MEAN MIDNIGHT.

Date.	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
July 1	+7.12	−3.11	+0.01	−0.04	148.88	+0.95	338.67
2	6.77	4.36	0.01	0.04	161.09	0.94	337.72
3	6.10	5.38	0.01	0.04	173.31	0.92	337.69
4	5.17	6.12	0.01	0.04	185.53	0.90	338.56
5	4.05	6.59	0.01	0.04	197.76	0.89	340.34
6	+2.82	−6.76	+0.01	−0.04	210.00	+0.88	343.03
7	1.54	6.65	0.00	0.04	222.24	0.87	346.61
8	+0.25	6.25	0.00	0.04	234.48	0.85	350.95
9	−0.99	5.58	0.00	0.04	246.73	0.84	355.83
10	2.16	4.66	0.00	0.04	258.99	0.82	0.95
11	−3.23	−3.52	0.00	−0.04	271.24	+0.80	5.96
12	4.17	2.21	0.00	0.04	283.49	0.78	10.56
13	4.95	−0.78	0.00	0.04	295.74	0.76	14.54
14	5.55	+0.71	0.00	0.04	307.99	0.74	17.77
15	5.93	2.19	0.00	0.04	320.24	0.71	20.19
16	−6.07	+3.58	0.00	−0.04	332.48	+0.68	21.76
17	5.93	4.81	0.00	0.04	344.71	0.65	22.40
18	5.49	5.79	0.00	0.04	356.94	0.62	22.00
19	4.73	6.45	0.00	0.04	9.16	0.59	20.42
20	3.67	6.74	+0.01	0.04	21.37	0.56	17.50
21	−2.35	+6.61	+0.01	−0.04	33.58	+0.53	13.21
22	−0.84	6.04	0.01	0.04	45.78	0.49	7.72
23	+0.76	5.07	0.01	0.04	57.98	0.46	1.52
24	2.32	3.76	0.01	0.04	70.17	0.43	355.31
25	3.73	2.22	0.01	0.04	82.36	0.39	349.72
26	+4.89	+0.55	+0.01	−0.04	94.54	+0.36	345.13
27	5.72	−1.12	0.01	0.04	106.73	0.33	341.66
28	6.18	2.68	0.01	0.04	118.93	0.30	339.29
29	6.26	4.05	0.01	0.04	131.12	0.27	337.94
30	5.98	5.18	0.01	0.04	143.33	0.25	337.56
31	+5.37	−6.03	+0.01	−0.04	155.53	+0.23	338.12
Aug. 1	4.49	6.58	0.01	0.04	167.74	0.21	339.62
2	3.41	6.83	0.01	0.04	179.96	0.19	342.06
3	2.20	6.79	0.01	0.04	192.19	0.17	345.39
4	+0.93	6.46	0.01	0.04	204.42	0.15	349.53
5	−0.34	−5.84	+0.01	−0.04	216.65	+0.13	354.29
6	1.55	4.97	0.01	0.04	228.89	0.12	359.37
7	2.63	3.88	0.01	0.04	241.13	0.10	4.46
8	3.56	2.60	0.01	0.04	253.38	0.08	9.24
9	4.28	−1.17	0.01	0.04	265.62	0.06	13.46
10	−4.78	+0.35	+0.01	−0.04	277.87	+0.04	16.96
11	5.03	1.87	0.01	0.04	290.12	+0.01	19.65
12	5.04	3.32	0.01	0.04	302.36	−0.02	21.47
13	4.80	4.60	0.01	0.04	314.60	0.05	22.36
14	4.33	5.64	0.01	0.04	326.84	0.08	22.22
15	−3.65	+6.38	+0.01	−0.04	339.07	−0.11	20.92
16	−2.78	+6.75	+0.01	−0.04	351.29	−0.14	18.35

EMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR WASHINGTON MEAN MIDNIGHT.

	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
	−2.78	+6.75	+0.01	−0.04	351.29	−0.14	18.35
7	1.77	6.71	0.01	0.04	3.51	0.17	14.45
8	−0.65	6.25	0.01	0.04	15.72	0.20	9.36
9	+0.51	5.40	0.02	0.04	27.92	0.24	3.47
20	1.67	4.22	0.02	0.04	40.11	0.28	357.36
21	+2.76	+2.77	+0.02	−0.04	52.30	−0.31	351.64
22	3.73	+1.16	0.02	0.04	64.48	0.35	346.75
23	4.51	−0.50	0.02	0.04	76.67	0.39	342.89
24	5.05	2.11	0.02	0.04	88.85	0.42	340.09
25	5.33	3.56	0.02	0.04	101.03	0.45	338.33
26	+5.31	−4.79	+0.02	−0.04	113.21	−0.48	337.57
27	4.99	5.75	0.02	0.04	125.39	0.51	337.78
28	4.38	6.41	0.02	0.04	137.58	0.54	338.95
29	3.52	6.76	0.02	0.04	149.78	0.56	341.08
30	2.46	6.80	0.02	0.04	161.98	0.58	344.15
31	+1.26	−6.55	+0.02	−0.04	174.18	−0.59	348.05
t. 1	−0.02	6.02	0.02	0.04	186.39	0.61	352.63
2	1.29	5.23	0.02	0.04	198.61	0.62	357.63
3	2.49	4.21	0.02	0.04	210.83	0.64	2.74
4	3.53	2.99	0.02	0.04	223.05	0.65	7.64
5	−4.35	−1.61	+0.02	−0.04	235.28	−0.67	12.07
6	4.90	−0.13	0.02	0.04	247.51	0.68	15.84
7	5.14	+1.40	0.02	0.04	259.75	0.70	18.85
8	5.04	2.88	0.02	0.03	271.98	0.72	21.01
9	4.62	4.23	0.02	0.03	284.22	0.74	22.22
10	−3.91	+5.36	+0.02	−0.03	296.45	−0.76	22.40
11	2.98	6.18	0.02	0.03	308.68	0.79	21.40
12	1.90	6.62	0.02	0.03	320.91	0.81	19.11
13	−0.75	6.66	0.02	0.03	333.13	0.84	15.48
14	+0.39	6.28	0.02	0.03	345.34	0.87	10.62
15	+1.46	+5.51	+0.02	−0.03	357.55	−0.89	4.89
16	2.42	4.42	0.02	0.03	9.75	0.92	358.86
17	3.24	3.06	0.02	0.03	21.94	0.96	353.11
18	3.91	+1.53	0.02	0.03	34.12	0.99	348.07
19	4.43	−0.07	0.02	0.03	46.30	1.02	343.97
20	+4.77	−1.65	+0.02	−0.03	58.47	−1.05	340.89
21	4.93	3.11	0.02	0.04	70.64	1.08	338.81
22	4.90	4.38	0.02	0.04	82.81	1.11	337.70
23	4.66	5.40	0.02	0.04	94.97	1.14	337.56
24	4.19	6.14	0.02	0.04	107.14	1.16	338.39
25	+3.49	−6.57	+0.02	−0.04	119.31	−1.18	340.20
26	2.58	6.69	0.02	0.04	131.48	1.20	342.97
27	1.49	6.51	0.02	0.04	143.66	1.21	346.63
28	+0.26	6.06	0.02	0.04	155.84	1.22	351.02
29	−1.05	5.34	0.02	0.04	168.03	1.23	355.90
30	−2.37	−4.40	+0.02	−0.04	180.22	−1.23	0.97
Oct. 1	−3.61	−3.26	+0.02	−0.04	192.41	−1.24	5.02

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR WASHINGTON MEAN MIDNIGHT.

Date.		The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		*C*
		Long.	Lat.	Long.	Lat.	Colong.	Lat.	
		°	°	°	°	°	°	°
Oct.	1	−3.61	−3.26	+0.02	−0.04	192.41	−1.24	5.92
	2	4.67	1.96	0.02	0.04	204.61	1.25	10.49
	3	5.48	−0.54	0.02	0.04	216.82	1.25	14.49
	4	5.96	+0.94	0.02	0.03	229.03	1.26	17.78
	5	6.04	2.41	0.02	0.03	241.25	1.27	20.28
	6	−5.70	+3.79	+0.02	−0.03	253.46	−1.27	21.89
	7	4.93	4.98	0.02	0.03	265.68	1.28	22.49
	8	3.79	5.89	0.02	0.03	277.90	1.29	21.93
	9	2.38	6.43	0.02	0.03	290.12	1.30	20.04
	10	−0.83	6.55	0.02	0.03	302.34	1.31	16.73
	11	+0.73	+6.24	+0.02	−0.03	314.55	−1.33	12.06
	12	2.17	5.53	0.02	0.03	326.76	1.35	6.39
	13	3.39	4.47	0.02	0.03	338.96	1.37	0.28
	14	4.35	3.15	0.02	0.03	351.15	1.39	354.38
	15	5.03	1.66	0.02	0.03	3.33	1.41	349.16
	16	+5.45	+0.10	+0.02	−0.03	15.51	−1.43	344.86
	17	5.64	−1.44	0.02	0.03	27.68	1.45	341.57
	18	5.62	2.88	0.02	0.03	39.84	1.47	339.26
	19	5.42	4.14	0.02	0.03	52.00	1.49	337.90
	20	5.05	5.17	0.02	0.03	64.16	1.51	337.47
	21	+4.52	−5.94	+0.02	−0.03	76.31	−1.52	338.00
	22	3.82	6.41	0.02	0.04	88.46	1.53	339.49
	23	2.96	6.57	0.02	0.04	100.61	1.54	341.97
	24	1.94	6.44	0.02	0.04	112.76	1.55	345.37
	25	+0.77	6.03	0.02	0.04	124.92	1.55	349.56
	26	−0.52	−5.35	+0.02	−0.04	137.08	−1.55	354.32
	27	1.88	4.45	0.02	0.04	149.24	1.55	359.34
	28	3.24	3.36	0.02	0.04	161.40	1.54	4.32
	29	4.53	2.11	0.02	0.03	173.57	1.54	8.98
	30	5.65	−0.76	0.02	0.03	185.75	1.53	13.12
	31	−6.52	+0.66	+0.02	−0.03	197.93	−1.53	16.62
Nov.	1	7.05	2.08	0.02	0.03	210.12	1.52	19.39
	2	7.15	3.42	0.02	0.03	222.31	1.51	21.35
	3	6.74	4.63	0.02	0.03	234.50	1.51	22.39
	4	5.83	5.61	0.02	0.03	246.70	1.50	22.36
	5	−4.45	+6.26	+0.02	−0.03	258.91	−1.50	21.06
	6	2.72	6.50	0.02	0.03	271.11	1.49	18.31
	7	−0.78	6.29	0.02	0.03	283.32	1.49	14.06
	8	+1.18	5.64	0.02	0.03	295.52	1.49	8.53
	9	2.99	4.60	0.02	0.03	307.72	1.49	2.29
	10	+4.51	+3.27	+0.02	−0.03	319.91	−1.49	356.06
	11	5.66	1.76	0.02	0.03	332.10	1.50	350.46
	12	6.43	+0.17	0.02	0.03	344.28	1.50	345.83
	13	6.82	−1.38	0.02	0.03	356.45	1.50	342.25
	14	6.88	2.83	0.02	0.03	8.62	1.51	339.69
	15	+6.66	−4.09	+0.02	−0.03	20.78	−1.52	338.10
	16	+6.22	−5.13	+0.02	−0.03	32.93	−1.52	337.45

MERIS FOR PHYSICAL OBSERVATIONS OF THE MOON.

FOR WASHINGTON MEAN MIDNIGHT.

	The Earth's Selenographic—		Physical Libration.		The Sun's Selenographic—		C
	Long.	Lat.	Long.	Lat.	Colong.	Lat.	
	°	°	°	°	°	°	°
	+6.22	−5.13	+0.02	−0.03	32.93	−1.52	337.45
	5.59	5.90	0.02	0.03	45.08	1.53	337.73
	4.80	6.39	0.02	0.03	57.22	1.53	338.96
	3.87	6.58	0.02	0.03	69.36	1.53	341.16
	2.82	6.46	0.02	0.03	81.50	1.52	344.30
1	+1.66	−6.06	+0.02	−0.03	93.64	−1.52	348.29
2	+0.40	5.40	0.02	0.03	105.77	1.51	352.92
3	−0.93	4.52	0.02	0.03	117.91	1.49	357.91
24	2.31	3.44	0.02	0.03	130.05	1.48	2.92
25	3.68	2.20	0.01	0.03	142.20	1.46	7.67
26	−4.98	−0.86	+0.01	−0.03	154.35	−1.44	11.94
27	6.13	+0.53	0.01	0.03	166.50	1.42	15.59
28	7.05	1.93	0.01	0.03	178.66	1.40	18.55
29	7.65	3.27	0.01	0.03	190.82	1.38	20.75
30	7.83	4.48	0.01	0.03	202.99	1.36	22.13
1	−7.53	+5.48	+0.01	−0.03	215.17	−1.34	22.56
2	6.71	6.20	0.01	0.03	227.35	1.32	21.86
3	5.39	6.56	0.01	0.03	239.54	1.30	19.82
4	3.64	6.49	0.01	0.03	251.73	1.28	16.27
5	−1.59	5.96	0.01	0.03	263.92	1.27	11.25
6	+0.56	+5.00	+0.01	−0.03	276.12	−1.25	5.14
7	2.63	3.68	0.01	0.03	288.31	1.23	358.65
8	4.44	2.12	0.01	0.03	300.50	1.22	352.54
9	5.88	+0.46	0.01	0.03	312.69	1.21	347.34
10	6.88	−1.19	0.01	0.03	324.87	1.20	343.26
11	+7.44	−2.73	+0.02	−0.03	337.04	−1.19	340.30
12	7.59	4.07	0.02	0.03	349.20	1.18	338.40
13	7.37	5.16	0.02	0.03	1.36	1.17	337.49
14	6.85	5.97	0.02	0.03	13.52	1.16	337.53
15	6.09	6.48	0.02	0.03	25.67	1.14	338.52
16	+5.14	−6.69	+0.01	−0.03	37.81	−1.13	340.48
17	4.05	6.60	0.01	0.03	49.95	1.12	343.38
18	2.85	6.22	0.01	0.03	62.08	1.11	347.16
19	1.57	5.58	0.01	0.03	74.21	1.09	351.65
20	+0.25	4.70	0.01	0.03	86.34	1.07	356.58
21	−1.10	−3.62	+0.01	−0.03	98.47	−1.05	1.63
22	2.44	2.37	0.01	0.03	110.60	1.02	6.49
23	3.73	−1.02	+0.01	0.03	122.73	0.99	10.91
24	4.94	+0.39	0.00	0.03	134.87	0.96	14.72
25	6.01	1.80	0.00	0.03	147.01	0.93	17.85
26	−6.86	+3.15	0.00	−0.03	159.15	−0.90	20.24
27	7.44	4.38	0.00	0.03	171.30	0.87	21.84
28	7.67	5.42	0.00	0.03	183.45	0.84	22.57
29	7.49	6.20	0.00	0.03	195.61	0.81	22.30
30	6.86	6.64	0.00	0.03	207.78	0.78	20.84
31	−5.78	+6.71	0.00	−0.03	219.95	−0.75	18.04
32	−4.28	+6.34	0.00	−0.03	232.13	−0.72	13.74

ILLUMINATED DISK OF MERCURY, 1915.

FOR WASHINGTON MEAN NOON.

Date.		*k*	*i*	*θ*	*L*	Stellar Mag.	Date.		*k*	*i*	*θ*	*L*	Stellar Mag.
			°	°						°	°		
Jan.	1	0.997	6	142	25.1	−0.8	July	5	0.073	149	159	10.7	+2.1
	6	0.999	4	65	26.9	0.9		10	0.162	133	167	22.2	1.5
	11	0.993	10	19	30.1	0.9		15	0.279	116	172	34.0	0.9
	16	0.975	18	3	35.2	0.9		20	0.423	99	177	46.0	+0.3
	21	0.939	29	354	42.9	0.9		25	0.588	80	183	57.8	−0.3
	26	0.868	43	347	53.3	−0.9		30	0.758	59	190	66.7	−0.8
	31	0.744	61	342	64.3	0.7	Aug.	4	0.898	37	198	68.4	1.1
Feb.	5	0.553	84	337	68.2	−0.4		9	0.979	17	213	62.0	1.5
	10	0.317	111	332	53.6	+0.4		14	0.998	5	299	52.0	1.6
	15	0.110	141	324	23.0	1.4		19	0.982	16	4	43.0	1.2
	20	0.012	168	280	2.6	+2.7		24	0.949	26	15	36.4	−0.8
	25	0.043	156	183	8.5	2.2		29	0.910	35	20	32.0	0.5
Mar.	2	0.154	134	169	23.6	1.4	Sept.	3	0.869	42	22	29.5	0.3
	7	0.280	116	164	32.3	0.9		8	0.826	49	24	28.3	−0.1
	12	0.393	102	161	34.5	0.7		13	0.780	56	25	28.4	+0.1
	17	0.488	91	158	33.8	+0.5		18	0.727	63	26	29.4	+0.1
	22	0.566	82	156	32.6	0.4		23	0.665	71	26	31.5	0.2
	27	0.633	75	154	31.6	0.3		28	0.586	80	27	34.4	0.3
Apr.	1	0.692	67	152	31.5	+0.1	Oct.	3	0.486	92	27	37.4	0.4
	6	0.751	60	151	32.4	0.0		8	0.356	107	28	37.8	0.7
	11	0.808	52	150	34.7	−0.2		13	0.199	127	30	30.1	+1.1
	16	0.867	43	149	38.8	0.5		18	0.051	154	35	10.5	2.0
	21	0.926	32	149	45.1	0.9		23	0.005	172	185	1.2	2.8
	26	0.977	18	149	53.6	1.4		28	0.133	137	206	28.1	1.2
May	1	1.000	1	89	62.7	1.9	Nov.	2	0.369	105	208	57.0	+0.2
	6	0.971	20	338	68.4	−1.6		7	0.594	79	208	62.0	−0.4
	11	0.879	41	341	66.6	1.2		12	0.756	59	207	53.6	0.6
	16	0.749	60	345	59.0	0.7		17	0.859	44	205	43.7	0.6
	21	0.613	77	349	50.0	−0.2		22	0.920	33	202	35.9	0.7
	26	0.487	91	353	42.2	+0.3		27	0.958	24	198	30.5	0.7
	31	0.374	105	357	35.5	+0.7	Dec.	2	0.980	16	192	27.1	−0.7
June	5	0.273	117	0	29.3	1.1		7	0.993	10	182	25.1	0.7
	10	0.180	130	4	22.2	1.5		12	0.999	4	157	24.4	0.8
	15	0.099	143	9	14.0	1.9		17	0.999	4	59	24.7	0.8
	20	0.038	158	19	5.9	2.5		22	0.994	9	24	26.2	0.8
	25	0.008	170	62	1.3	+3.1		27	0.981	16	12	29.1	−0.8
	30	0.019	164	140	3.2	+2.8		32	0.957	24	4	33.7	−0.8

NOTATION.

k=the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i=the angle between the Sun and Earth, as seen from the planet.

θ=the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L=the brilliancy of the disk. The unit of *L* is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

The magnitudes of the planet have been computed from formulæ given in the Potsdam Observations, vol. 8, page 366.

ILLUMINATED DISK OF VENUS, 1915.

FOR WASHINGTON MEAN NOON.

Date.	k	i	θ	L	Stellar Mag.	Date.	k	i	θ	L	Stellar Mag.
		°	°					°	°		
Jan. 1	0.255	119.3	196.8	218.9	−4.4	July 5	0.946	26.8	175.9	51.3	−3.3
6	0.297	113.9	195.6	216.8	4.4	10	0.954	24.8	179.1	50.7	3.3
11	0.336	109.2	194.1	209.8	4.3	15	0.961	22.9	182.4	50.2	3.3
16	0.372	104.9	192.4	200.2	4.3	20	0.967	21.0	185.8	49.7	3.3
21	0.406	100.9	190.5	189.6	4.2	25	0.973	19.0	189.2	49.3	3.4
26	0.437	97.3	188.4	178.7	−4.2	30	0.978	17.0	192.7	48.9	−3.4
31	0.466	93.9	186.1	168.0	4.1	Aug. 4	0.983	15.1	196.3	48.6	3.4
Feb. 5	0.493	90.8	183.8	157.7	4.1	9	0.987	13.2	200.0	48.3	3.4
10	0.519	87.8	181.3	148.1	4.0	14	0.990	11.3	203.9	48.1	3.4
15	0.544	85.0	178.8	139.1	4.0	19	0.993	9.4	208.2	47.9	3.4
20	0.567	82.4	176.2	130.9	−3.9	24	0.996	7.5	213.3	47.7	−3.4
25	0.589	79.8	173.7	123.3	3.9	29	0.998	5.7	220.0	47.6	3.5
Mar. 2	0.610	77.3	171.2	116.4	3.8	Sept. 3	0.999	4.0	231.4	47.5	3.5
7	0.630	74.9	168.8	110.1	3.8	8	1.000	2.5	254.9	47.4	3.5
12	0.649	72.6	166.5	104.4	3.7	13	1.000	2.0	303.5	47.4	3.5
17	0.668	70.4	164.3	99.2	−3.7	18	0.999	3.0	342.6	47.4	−3.5
22	0.686	68.2	162.3	94.4	3.7	23	0.999	4.5	359.1	47.5	3.5
27	0.703	66.1	160.5	90.0	3.6	28	0.997	6.2	6.9	47.6	3.5
Apr. 1	0.719	64.0	158.9	86.0	3.6	Oct. 3	0.995	7.9	11.1	47.7	3.4
6	0.735	61.9	157.5	82.4	3.5	8	0.993	9.7	13.6	47.9	3.4
11	0.751	59.9	156.4	79.0	−3.5	13	0.990	11.4	15.0	48.1	−3.4
16	0.766	57.9	155.5	75.9	3.5	18	0.987	13.1	15.6	48.3	3.4
21	0.780	55.9	154.8	73.2	3.5	23	0.983	14.9	15.6	48.6	3.4
26	0.794	53.9	154.4	70.6	3.4	28	0.979	16.6	15.1	49.0	3.4
May 1	0.808	52.0	154.3	68.2	3.4	Nov. 2	0.975	18.3	14.2	49.4	3.4
6	0.821	50.1	154.4	66.1	−3.4	7	0.970	20.0	13.0	49.8	−3.4
11	0.834	48.1	154.8	64.1	3.4	12	0.965	21.6	11.4	50.3	3.3
16	0.846	46.2	155.5	62.3	3.4	17	0.959	23.3	9.6	50.9	3.3
21	0.858	44.3	156.4	60.7	3.3	22	0.953	25.0	7.5	51.5	3.3
26	0.870	42.3	157.6	59.2	3.3	27	0.947	26.6	5.3	52.2	3.3
31	0.881	40.4	159.0	57.9	−3.3	Dec. 2	0.940	28.3	2.9	52.9	−3.3
June 5	0.892	38.5	160.7	56.6	3.3	7	0.933	30.0	0.4	53.8	3.3
10	0.902	36.5	162.7	55.5	3.3	12	0.926	31.6	357.9	54.7	3.3
15	0.912	34.6	164.9	54.5	3.3	17	0.918	33.3	355.4	55.7	3.3
20	0.921	32.7	167.3	53.6	3.3	22	0.910	35.0	353.0	56.8	3.3
25	0.930	30.7	170.0	52.8	−3.3	27	0.901	36.7	350.6	57.9	−3.4
30	0.938	28.8	172.9	52.0	−3.3	32	0.892	38.4	348.4	59.1	−3.4

NOTATION.

k=the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i=the angle between the Sun and Earth, as seen from the planet.

θ=the angle which the line joining the cusps, or extremities of the illuminated portion, makes with the meridian.

L=the brilliancy of the disk. The unit of L is the amount of light received by an eye from a circular disk with the same albedo as the planet, subtending an angular radius of one second of arc, situated at distance unity from the Sun, and illuminated by the latter as the mean disk of the planet is illuminated.

The magnitudes of the planet have been computed from formulæ given in the Potsdam Observations, vol. 8, page 366.

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

WASHINGTON MEAN TIME.

Noon.	Light-Time.	Stellar Magnitude.	P	$A_{\oplus}+180°$	$D_{\oplus}$	$A_{\odot}-A_{\oplus}$	$D_{\odot}$	⊙♂
	m		°	°	°	°	°	°
July 1	16.75	+1.4	324.02	150.93	−11.43	−28.03	−20.48	300.60
3	16.69	1.4	324.24	152.28	10.90	28.15	20.21	301.78
5	16.63	1.4	324.48	153.62	10.37	28.27	19.94	302.95
7	16.57	1.4	324.75	154.95	9.83	28.38	19.66	304.12
9	16.51	1.4	325.03	156.27	9.29	28.50	19.37	305.30
11	16.45	+1.4	325.34	157.58	− 8.75	−28.61	−19.08	306.46
13	16.39	1.4	325.66	158.88	8.20	28.73	18.78	307.62
15	16.33	1.4	326.01	160.18	7.65	28.85	18.47	308.78
17	16.27	1.4	326.38	161.47	7.10	28.96	18.15	309.94
19	16.20	1.4	326.77	162.75	6.55	29.08	17.83	311.09
21	16.14	+1.4	327.17	164.02	− 6.00	−29.20	−17.51	312.24
23	16.07	1.4	327.59	165.29	5.45	29.32	17.18	313.38
25	16.00	1.4	328.03	166.55	4.89	29.44	16.84	314.52
27	15.93	1.4	328.49	167.80	4.34	29.56	16.50	315.66
29	15.86	1.4	328.96	169.04	3.79	29.68	16.15	316.79
31	15.79	+1.4	329.45	170.28	− 3.24	−29.81	−15.80	317.92
Aug. 2	15.72	1.4	329.95	171.52	2.68	29.93	15.45	319.04
4	15.64	1.4	330.47	172.75	2.13	30.06	15.09	320.16
6	15.57	1.4	331.00	173.97	1.58	30.19	14.72	321.28
8	15.49	1.4	331.54	175.19	1.03	30.32	14.35	322.39
10	15.41	+1.4	332.09	176.40	− 0.49	−30.46	−13.98	323.50
12	15.33	1.4	332.66	177.61	+ 0.05	30.59	13.61	324.61
14	15.25	1.4	333.24	178.81	0.59	30.73	13.24	325.71
16	15.17	1.4	333.83	180.01	1.13	30.87	12.86	326.81
18	15.09	1.4	334.43	181.20	1.66	31.01	12.47	327.90
20	15.00	+1.4	335.04	182.38	+ 2.19	−31.15	−12.08	328.99
22	14.92	1.4	335.65	183.56	2.71	31.30	11.69	330.08
24	14.83	1.4	336.27	184.74	3.23	31.44	11.30	331.16
26	14.74	1.3	336.91	185.92	3.75	31.60	10.91	332.24
28	14.65	1.3	337.55	187.09	4.26	31.75	10.51	333.32
30	14.56	+1.3	338.20	188.25	+ 4.76	−31.90	−10.11	334.39
Sept. 1	14.46	1.3	338.85	189.41	5.26	32.06	9.72	335.46
3	14.37	1.3	339.51	190.57	5.76	32.22	9.32	336.52
5	14.27	1.3	340.17	191.73	6.25	32.38	8.92	337.58
7	14.17	1.3	340.84	192.88	6.74	32.54	8.51	338.64
9	14.07	+1.3	341.51	194.02	+ 7.22	−32.70	− 8.11	339.69
11	13.97	1.3	342.18	195.16	7.69	32.86	7.70	340.74
13	13.87	1.3	342.85	196.30	8.15	33.03	7.30	341.79
15	13.77	1.3	343.53	197.43	8.61	33.19	6.89	342.83
17	13.66	1.2	344.21	198.56	9.06	33.36	6.48	343.87
19	13.56	+1.2	344.89	199.68	+ 9.51	−33.52	− 6.07	344.91
21	13.45	1.2	345.57	200.80	9.95	33.69	5.66	345.94
23	13.34	1.2	346.26	201.92	10.38	33.86	5.25	346.97
25	13.23	1.2	346.94	203.03	10.80	34.02	4.85	347.99
27	13.12	1.2	347.62	204.14	11.21	34.19	4.44	349.02
29	13.00	+1.2	348.30	205.24	+11.61	−34.36	− 4.03	350.03
Oct. 1	12.89	+1.2	348.97	206.33	+12.01	−34.52	− 3.62	351.05

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

WASHINGTON MEAN TIME.

Noon.		k	Diameter.	i	q	Q	Central Meridian.	Transit of Zero Meridian.	
								Of Date.	Of Intermediate Date.
			″	°	″	°	°	h m	h m
July	1	0.940	5.01	28.37	0.30	256.15	9.33	. . . . .	0 1.8
	3	0.939	5.03	28.61	0.31	256.68	349.78	0 42.0	1 22.2
	5	0.938	5.05	28.86	0.31	257.21	330.24	2 2.4	2 42.5
	7	0.937	5.06	29.10	0.32	257.75	310.71	3 22.7	4 2.8
	9	0.936	5.08	29.34	0.33	258.29	291.19	4 42.9	5 23.0
	11	0.935	5.10	29.58	0.33	258.85	271.68	6 3.1	6 43.2
	13	0.934	5.12	29.82	0.34	259.41	252.17	7 23.3	8 3.4
	15	0.933	5.14	30.05	0.34	259.97	232.67	8 43.5	9 23.5
	17	0.932	5.16	30.29	0.35	260.54	213.18	10 3.6	10 43.6
	19	0.931	5.18	30.52	0.36	261.11	193.70	11 23.7	12 3.7
	21	0.930	5.20	30.75	0.37	261.69	174.23	12 43.7	13 23.7
	23	0.929	5.22	30.99	0.37	262.27	154.77	14 3.7	14 43.7
	25	0.928	5.24	31.22	0.38	262.86	135.31	15 23.7	16 3.7
	27	0.927	5.26	31.45	0.39	263.44	115.86	16 43.7	17 23.7
	29	0.926	5.29	31.68	0.39	264.03	96.41	18 3.6	18 43.6
	31	0.924	5.31	31.90	0.40	264.62	76.97	19 23.5	20 3.5
Aug.	2	0.923	5.34	32.13	0.41	265.21	57.54	20 43.4	21 23.3
	4	0.922	5.36	32.35	0.42	265.80	38.11	22 3.2	22 43.2
	6	0.921	5.39	32.58	0.42	266.40	18.69	23 23.1	. . . . .
	8	0.920	5.41	32.80	0.43	266.99	359.28	0 3.0	0 42.9
	10	0.919	5.44	33.02	0.44	267.59	339.87	1 22.8	2 2.6
	12	0.918	5.47	33.24	0.45	268.18	320.47	2 42.5	3 22.4
	14	0.917	5.50	33.45	0.46	268.76	301.07	4 2.3	4 42.1
	16	0.916	5.53	33.66	0.46	269.35	281.68	5 22.0	6 1.8
	18	0.915	5.56	33.87	0.47	269.94	262.29	6 41.7	7 21.5
	20	0.914	5.59	34.08	0.48	270.52	242.91	8 1.3	8 41.2
	22	0.913	5.63	34.29	0.49	271.10	223.53	9 21.0	10 0.8
	24	0.912	5.66	34.49	0.50	271.67	204.16	10 40.6	11 20.4
	26	0.911	5.69	34.69	0.51	272.25	184.79	12 0.2	12 40.0
	28	0.910	5.72	34.89	0.52	272.81	165.42	13 19.8	13 59.6
	30	0.909	5.76	35.09	0.52	273.37	146.06	14 39.4	15 19.2
Sept.	1	0.908	5.80	35.28	0.53	273.92	126.71	15 58.9	16 38.7
	3	0.907	5.84	35.47	0.54	274.47	107.36	17 18.5	17 58.2
	5	0.906	5.88	35.66	0.55	275.02	88.01	18 38.0	19 17.7
	7	0.905	5.92	35.84	0.56	275.55	68,67	19 57.5	20 37.2
	9	0.905	5.97	36.02	0.57	276.08	49.33	21 17.0	21 56.7
	11	0.904	6.01	36.20	0.58	276.60	30.00	22 36.4	23 16.1
	13	0.903	6.05	36.37	0.59	277.12	10.67	23 55.8	. . . . .
	15	0.902	6.10	36.54	0.60	277.63	351.35	0 35.6	1 15.3
	17	0.901	6.14	36.70	0.61	278.13	332.03	1 55.0	2 34.7
	19	0.900	6.19	36.86	0.62	278.62	312.72	3 14.4	3 54.0
	21	0.899	6.24	37.02	0.63	279.10	293.41	4 33.7	5 13.4
	23	0.898	6.29	37.17	0.64	279.57	274.10	5 53.1	6 32.7
	25	0.898	6.34	37.31	0.65	280.03	254.80	7 12.4	7 52.0
	27	0.897	6.40	37.45	0.66	280.49	235.51	8 31.7	9 11.3
	29	0.896	6.45	37.58	0.67	280.93	216.22	9 51.0	10 30.6
Oct.	1	0.896	6.51	37.71	0.68	281.36	196.94	11 10.2	11 49.8

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

WASHINGTON MEAN TIME.

Noon.	Light-Time.	Stellar Magnitude.	P	$A_{\oplus}+180°$	$D_{\oplus}$	$A_{\odot}-A_{\oplus}$	$D_{\odot}$	$\odot_{♂}$
	m		°	°	°	°	°	°
Oct. 1	12.89	+1.2	348.97	206.33	+12.01	−34.52	− 3.62	351.05
3	12.77	1.1	349.65	207.42	12.40	34.68	3.21	352.06
5	12.65	1.1	350.32	208.51	12.78	34.84	2.81	353.07
7	12.53	1.1	350.99	209.59	13.15	35.00	2.40	354.08
9	12.41	1.1	351.66	210.66	13.51	35.16	2.00	355.08
11	12.29	+1.1	352.32	211.72	+13.86	−35.31	− 1.59	356.08
13	12.17	1.1	352.97	212.78	14.20	35.46	1.19	357.07
15	12.04	1.1	353.62	213.83	14.53	35.60	0.78	358.06
17	11.92	1.0	354.27	214.87	14.86	35.73	− 0.38	359.05
19	11.79	1.0	354.92	215.90	15.18	35.86	+ 0.02	0.04
21	11.66	+1.0	355.55	216.92	+15.48	−35.99	+ 0.42	1.02
23	11.53	1.0	356.17	217.93	15.77	36.11	0.82	2.00
25	11.40	1.0	356.79	218.94	16.05	36.22	1.21	2.98
27	11.27	0.9	357.40	219.94	16.32	36.32	1.61	3.96
29	11.14	0.9	358.01	220.92	16.58	36.41	2.00	4.93
31	11.01	+0.9	358.61	221.89	+16.83	−36.50	+ 2.40	5.90
Nov. 2	10.87	0.9	359.19	222.84	17.08	36.57	2.79	6.86
4	10.74	0.8	359.77	223.79	17.31	36.63	3.18	7.83
6	10.60	0.8	0.34	224.72	17.53	36.68	3.56	8.79
8	10.47	0.8	0.90	225.63	17.74	36.71	3.95	9.75
10	10.33	+0.7	1.44	226.53	+17.94	−36.73	+ 4.33	10.70
12	10.19	0.7	1.97	227.41	18.13	36.74	4.71	11.65
14	10.05	0.7	2.49	228.27	18.30	36.72	5.09	12.60
16	9.91	0.7	3.00	229.11	18.46	36.69	5.47	13.55
18	9.78	0.6	3.49	229.93	18.62	36.64	5.84	14.49
20	9.64	+0.6	3.97	230.73	+18.77	−36.57	+ 6.21	15.44
22	9.50	0.6	4.44	231.51	18.90	36.48	6.58	16.38
24	9.36	0.5	4.89	232.26	19.02	36.37	6.95	17.31
26	9.22	0.5	5.32	233.00	19.13	36.23	7.31	18.25
28	9.08	0.5	5.74	233.71	19.24	36.07	7.67	19.19
30	8.94	+0.4	6.14	234.38	+19.33	−35.88	+ 8.03	20.12
Dec. 2	8.80	0.4	6.52	235.03	19.41	35.66	8.39	21.04
4	8.66	0.4	6.88	235.65	19.48	35.41	8.75	21.97
6	8.52	0.3	7.22	236.23	19.54	35.13	9.10	22.90
8	8.38	0.3	7.54	236.78	19.58	34.82	9.45	23.82
10	8.25	+0.3	7.84	237.30	+19.62	−34.47	+ 9.79	24.74
12	8.11	0.2	8.12	237.78	19.65	34.08	10.14	25.66
14	7.98	0.2	8.38	238.22	19.66	33.65	10.48	26.58
16	7.84	0.1	8.61	238.62	19.67	33.19	10.81	27.49
18	7.71	+0.1	8.82	238.97	19.66	32.68	11.15	28.41
20	7.58	0.0	9.01	239.29	+19.65	−32.13	+11.48	29.32
22	7.46	0.0	9.17	239.56	19.62	31.54	11.81	30.22
24	7.33	0.0	9.30	239.79	19.59	30.89	12.13	31.13
26	7.21	−0.1	9.40	239.97	19.55	30.20	12.45	32.04
28	7.08	0.1	9.48	240.09	19.49	29.46	12.77	32.94
30	6.97	−0.2	9.53	240.16	+19.42	−28.67	+13.08	33.84
32	6.85	−0.2	9.54	240.18	+19.35	−27.82	+13.39	34.74

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF MARS.

WASHINGTON MEAN TIME.

Noon.		*k*	Diameter.	*i*	*q*	*Q*	Central Meridian.	Transit of Zero Meridian.	
								Of Date.	Of Intermediate Date.
			″	°	″	°	°	h m	h m
Oct.	1	0.896	6.51	37.71	0.68	281.36	196.94	11 10.2	11 49.8
	3	0.895	6.57	37.83	0.69	281.78	177.66	12 29.4	13 9.0
	5	0.894	6.63	37.95	0.70	282.20	158.39	13 48.6	14 28.2
	7	0.894	6.69	38.06	0.71	282.60	139.12	15 7.8	15 47.4
	9	0.893	6.76	38.16	0.72	282.99	119.86	16 27.0	17 6.5
	11	0.893	6.83	38.25	0.73	283.37	100.61	17 46.0	18 25.6
	13	0.892	6.90	38.34	0.74	283.74	81.37	19 5.1	19 44.6
	15	0.892	6.97	38.41	0.75	284.10	62.14	20 24.2	21 3.7
	17	0.891	7.04	38.48	0.76	284.45	42.91	21 43.2	22 22.6
	19	0.891	7.12	38.53	0.77	284.79	23.69	23 2.1	23 41.6
	21	0.891	7.20	38.58	0.78	285.12	4.48	. . . . .	0 21.0
	23	0.891	7.28	38.62	0.80	285.43	345.28	1 0.5	1 39.9
	25	0.890	7.36	38.65	0.81	285.73	326.10	2 19.3	2 58.7
	27	0.890	7.45	38.66	0.82	286.02	306.92	3 38.1	4 17.5
	29	0.890	7.54	38.67	0.82	286.30	287.75	4 56.9	5 36.2
	31	0.890	7.63	38.66	0.83	286.57	268.60	6 15.6	6 54.9
Nov.	2	0.891	7.72	38.64	0.84	286.83	249.46	7 34.2	8 13.5
	4	0.891	7.81	38.61	0.85	287.07	230.33	8 52.8	9 32.1
	6	0.891	7.91	38.56	0.86	287.30	211.22	10 11.3	10 50.6
	8	0.891	8.01	38.49	0.88	287.52	192.13	11 29.8	12 9.0
	10	0.892	8.12	38.41	0.89	287.73	173.05	12 48.2	13 27.3
	12	0.892	8.23	38.31	0.90	287.92	153.98	14 6.5	14 45.6
	14	0.893	8.35	38.20	0.90	288.11	134.94	15 24.7	16 3.8
	16	0.894	8.47	38.07	0.91	288.28	115.92	16 42.8	17 21.9
	18	0.895	8.59	37.92	0.91	288.44	96.91	18 0.9	18 39.9
	20	0.895	8.71	37.75	0.92	288.58	77.93	19 18.8	19 57.8
	22	0.896	8.84	37.55	0.92	288.71	58.97	20 36.7	21 15.6
	24	0.897	8.97	37.34	0.92	288.83	40.03	21 54.4	22 33.3
	26	0.899	9.10	37.10	0.92	288.93	21.12	23 12.1	23 50.8
	28	0.900	9.24	36.84	0.92	289.02	2.23	. . . . .	0 29.6
	30	0.902	9.39	36.55	0.92	289.10	343.37	1 8.3	1 47.0
Dec.	2	0.903	9.54	36.23	0.92	289.16	324.54	2 25.6	3 4.2
	4	0.905	9.69	35.89	0.92	289.21	305.74	3 42.8	4 21.4
	6	0.907	9.85	35.52	0.92	289.24	286.97	4 59.9	5 38.4
	8	0.909	10.01	35.11	0.91	289.26	268.24	6 16.8	6 55.2
	10	0.911	10.18	34.67	0.90	289.26	249.54	7 33.6	8 11.9
	12	0.914	10.35	34.20	0.89	289.24	230.88	8 50.2	9 28.4
	14	0.916	10.52	33.70	0.88	289.20	212.26	10 6.6	10 44.8
	16	0.919	10.70	33.16	0.87	289.15	193.67	11 22.9	12 1.0
	18	0.921	10.88	32.57	0.86	289.08	175.13	12 39.0	13 17.0
	20	0.924	11.07	31.95	0.84	288.98	156.63	13 54.9	14 32.8
	22	0.927	11.26	31.29	0.82	288.86	138.17	15 10.6	15 48.4
	24	0.931	11.45	30.59	0.80	288.72	119.76	16 26.1	17 3.8
	26	0.934	11.65	29.84	0.77	288.56	101.40	17 41.4	18 19.0
	28	0.937	11.85	29.04	0.74	288.36	83.09	18 56.5	19 33.9
	30	0.941	12.05	28.20	0.71	288.14	64.83	20 11.3	20 48.7
	32	0.944	12.25	27.31	0.68	287.88	46.62	21 26.0	22 3.2

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

WASHINGTON MEAN TIME.

Noon.		Light-Time.	Stellar Magnitude.	P	$A_{\oplus}+180°$	$D_{\oplus}$	$A_{\odot}+180°$	$D_{\odot}$
		m		°	°	°	°	°
Jan.	1	47.34	−1.7	338.84	186.84	+0.36	194.42	+0.76
	8	47.91	1.6	338.48	188.33	0.42	195.04	0.80
	15	48.42	1.6	338.13	189.86	0.47	195.67	0.83
	22	48.86	1.6	337.79	191.45	0.53	196.30	0.86
	29	49.20	−1.6	337.45	193.07	+0.59	196.92	+0.89
Mar.	27	48.97	−1.6	335.35	206.63	+1.16	202.04	+1.15
Apr.	3	48.57	1.6	335.19	208.23	1.23	202.67	1.18
	10	48.09	1.6	335.05	209.79	1.30	203.30	1.22
	17	47.55	1.7	334.93	211.30	1.38	203.93	1.25
	24	46.94	1.7	334.83	212.75	1.45	204.56	1.28
May	1	46.28	−1.7	334.75	214.14	+1.52	205.19	+1.31
	8	45.56	1.7	334.68	215.46	1.59	205.82	1.34
	15	44.79	1.8	334.63	216.70	1.66	206.45	1.37
	22	43.98	1.8	334.60	217.86	1.73	207.09	1.40
	29	43.13	1.9	334.57	218.92	1.79	207.72	1.43
June	5	42.26	−1.9	334.55	219.86	+1.86	208.35	+1.46
	12	41.37	2.0	334.54	220.69	1.92	208.99	1.49
	19	40.47	2,0	334.54	221.39	1.97	209.62	1.52
	26	39.57	2.1	334.54	221.96	2.03	210.26	1.55
July	3	38.68	2.1	334.54	222.39	2.08	210.89	1.58
	10	37.82	−2.2	334.54	222.67	+2.12	211.52	+1.61
	17	36.99	2.2	334.54	222.78	2.16	212.16	1.64
	24	36.20	2.3	334.54	222.74	2.19	212.80	1.66
	31	35.47	2.3	334.54	222.54	2.22	213.43	1.69
Aug.	7	34.82	2.3	334.54	222.19	2.24	214.06	1.72
	14	34.24	−2.4	334.54	221.68	+2.25	214.70	+1.75
	21	33.75	2.4	334.54	221.04	2.26	215.34	1.78
	28	33.37	2.4	334.54	220.28	2.25	215.98	1.80
Sept.	4	33.10	2.5	334.55	219.44	2.24	216.61	1.83
	11	32.95	2.5	334.57	218.54	2.22	217.25	1.86
	18	32.92	−2.5	334.59	217.61	+2.20	217.89	+1.89
	25	33.01	2.5	334.62	216.68	2.16	218.53	1.91
Oct.	2	33.22	2.4	334.65	215.80	2.12	219.16	1.94
	9	33.55	2.4	334.68	214.99	2.08	219.80	1.97
	16	34.00	2.4	334.72	214.28	2.04	220.44	1.99
	23	34.54	−2.4	334.75	213.70	+2.00	221.08	+2.02
	30	35.17	2.3	334.78	213.27	1.96	221.72	2.04
Nov.	6	35.89	2.3	334.79	212.99	1.92	222.36	2.07
	13	36.67	2.2	334.80	212.88	1.89	222.99	2.09
	20	37.50	2.2	334.80	212.94	1.86	223.63	2.12
	27	38.38	−2.1	334.79	213.17	+1.84	224.27	+2.14
Dec.	4	39.28	2.1	334.77	213.56	1.83	224.91	2.17
	11	40.20	2.0	334.74	214.10	1.82	225.55	2.19
	18	41.12	2.0	334.70	214.79	1.82	226.19	2.22
	25	42.03	−1.9	334.67	215.62	1.82	226.83	2.24
	32	42.92	−1.9	334.63	216.58	+1.83	227.47	+2.26

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER.

WASHINGTON MEAN TIME.

Noon.		Equatorial Diameter.	Excess of Equat. Diameter over Polar.	*i*	*q*	*Q*	Central Meridian.		Correction for Phase.
							System I.	System II.	
		″	″	°	″	°	°	°	°
Jan.	1	35.18	2.13	7.59	0.15	71.89	37.30	13.15	−0.25
	8	34.75	2.11	6.73	0.12	71.77	60.76	343.21	0.20
	15	34.39	2.09	5.82	0.09	71.71	84.22	313.25	0.15
	22	34.09	2.07	4.86	0.06	71.74	107.66	283.30	0.10
	29	33.84	2.05	3.87	0.04	71.98	131.14	253.36	−0.07
Mar.	27	34.01	2.06	4.60	0.05	245.35	118.01	165.32	+0.09
Apr.	3	34.29	2.08	5.56	0.08	245.61	141.96	135.86	0.14
	10	34.62	2.10	6.49	0.11	245.76	165.99	106.48	0.18
	17	35.02	2.12	7.37	0.14	245.86	190.11	77.18	0.24
	24	35.47	2.15	8.21	0.18	245.93	214.32	47.98	0.29
May	1	35.98	2.18	8.96	0.22	246.00	238.63	18.89	+0.35
	8	36.55	2.22	9.64	0.26	246.05	263.05	349.89	0.41
	15	37.18	2.26	10.26	0.30	246.12	287.58	321.01	0.46
	22	37.87	2.30	10.78	0.33	246.19	312.22	292.23	0.51
	29	38.61	2.34	11.20	0.37	246.27	336.98	263.58	0.55
June	5	39.41	2.39	11.51	0.40	246.36	1.87	235.05	+0.58
	12	40.26	2.44	11.71	0.42	246.46	26.88	206.65	0.60
	19	41.15	2.49	11.78	0.43	246.56	52.03	178.38	0.61
	26	42.08	2.55	11.71	0.44	246.69	77.31	150.24	0.60
July	3	43.05	2.61	11.50	0.43	246.83	102.72	122.24	0.58
	10	44.03	2.67	11.15	0.42	247.00	128.27	94.38	+0.54
	17	45.02	2.73	10.63	0.39	247.20	153.96	66.66	0.49
	24	46.00	2.79	9.95	0.35	247.42	179.79	39.06	0.43
	31	46.94	2.84	9.12	0.30	247.70	205.73	11.59	0.36
Aug.	7	47.83	2.90	8.13	0.24	248.07	231.79	344.24	0.29
	14	48.64	2.95	6.99	0.18	248.55	257.95	316.98	+0.21
	21	49.33	2.99	5.72	0.12	249.26	284.18	289.80	0.14
	28	49.89	3.02	4.33	0.07	250.42	310.46	262.68	0.08
Sept.	4	50.30	3.05	2.86	0.03	252.76	336.77	235.57	0.04
	11	50.54	3.06	1.34	0.01	260.28	3.07	208.46	+0.01
	18	50.59	3.06	0.42	0.00	17.21	29.32	181.30	0.00
	25	50.44	3.06	1.86	0.01	56.96	55.49	154.06	−0.02
Oct.	2	50.12	3.04	3.37	0.04	61.57	81.54	126.70	0.05
	9	49.63	3.01	4.81	0.09	63.37	107.45	99.20	0.10
	16	48.98	2.97	6.15	0.14	64.36	133.18	71.53	0.17
	23	48.21	2.92	7.37	0.20	65.03	158.73	43.67	−0.24
	30	47.34	2.87	8.44	0.26	65.49	184.08	15.61	0.31
Nov.	6	46.40	2.81	9.36	0.31	65.86	209.22	347.35	0.38
	13	45.41	2.75	10.11	0.35	66.13	234.16	318.88	0.45
	20	44.40	2.69	10.69	0.39	66.36	258.89	290.20	0.50
	27	43.39	2.63	11.10	0.41	66.54	283.43	261.34	−0.54
Dec.	4	42.40	2.57	11.36	0.42	66.68	307.79	232.30	0.56
	11	41.43	2.51	11.45	0.41	66.81	331.99	203.09	0.57
	18	40.50	2.45	11.40	0.40	66.91	356.04	173.73	0.57
	25	39.63	2.40	11.21	0.38	67.01	19.95	144.24	0.55
	32	38.80	2.35	10.90	0.35	67.10	43.75	114.63	−0.52

EPHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER, SYSTEM I.

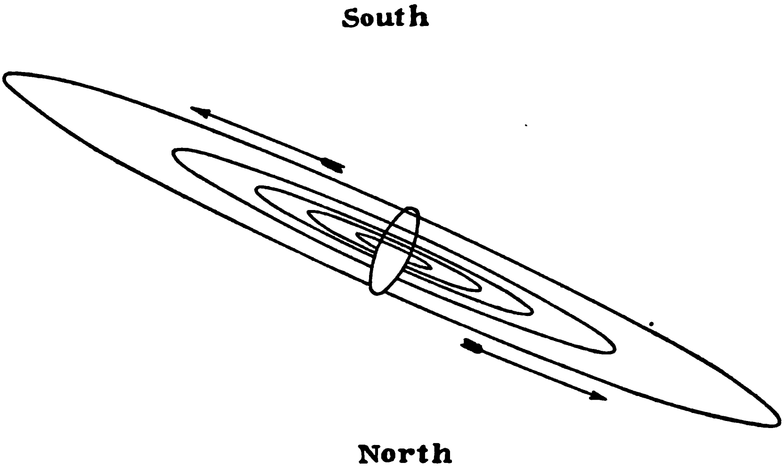
WASHINGTON MEAN TIME.

Transit of Zero Meridian.				Interval between Successive Transits.		Transit of Zero Meridian.				Interval between Successive Transits.		Transit of Zero Meridian.				Interval between Successive Transits.	
	d	h	m	h	m		d	h	m	h	m		d	h	m	h	m
Jan.	0	22	59.21	9	50.67	June	3	18	24.39	9	50.53	Sept.	18	9	2.34	9	50.41
	3	0	12.57				5	19	37.05				20	10	14.41		
	5	1	25.93				7	20	49.69				22	11	26.50		
	7	2	39.29				9	22	2.31				24	12	38.61		
	9	3	52.65				11	23	14.92				26	13	50.73		
	11	5	6.02	9	50.67		14	0	27.51	9	50.52		28	15	2.87	9	50.43
	13	6	19.38				16	1	40.08				30	16	15.03		
	15	7	32.75				18	2	52.64			Oct.	2	17	27.22		
	17	8	46.12				20	4	5.18				4	18	39.43		
	19	9	59.48				22	5	17.71				6	19	51.67		
	21	11	12.85	9	50.67		24	6	30.22	9	50.50		8	21	3.93	9	50.46
	23	12	26.22				26	7	42.71				10	22	16.22		
	25	13	39.58				28	8	55.18				12	23	28.53		
	27	14	52.94				30	10	7.64				15	0	40.87		
	29	16	6.30			July	2	11	20.08				17	1	53.24		
	31	17	19.65	9	50.67		4	12	32.50	9	50.48		19	3	5.64	9	50.48
							6	13	44.91				21	4	18.07		
							8	14	57.29				23	5	30.52		
Mar.	26	1	4.98	9	50.63		10	16	9.66				25	6	43.00		
	28	2	18.13				12	17	22.01				27	7	55.51		
	30	3	31.26	9	50.63		14	18	34.34	9	50.46		29	9	8.05	9	50.51
Apr.	1	4	44.39				16	19	46.66				31	10	20.62		
	3	5	57.50				18	20	58.96			Nov.	2	11	33.22		
	5	7	10.60				20	22	11.24				4	12	45.84		
	7	8	23.69				22	23	23.51				6	13	58.49		
	9	9	36.77	9	50.61		25	0	35.76	9	50.45		8	15	11.17	9	50.54
	11	10	49.83				27	1	48.00				10	16	23.88		
	13	12	2.88				29	3	0.22				12	17	36.62		
	15	13	15.92				31	4	12.42				14	18	49.38		
	17	14	28.94			Aug.	2	5	24.61				16	20	2.17		
	19	15	41.95	9	50.60		4	6	36.78	9	50.43		18	21	14.98	9	50.57
	21	16	54.94				6	7	48.94				20	22	27.82		
	23	18	7.92				8	9	1.09				22	23	40.69		
	25	19	20.88				10	10	13.22				25	0	53.58		
	27	20	33.83				12	11	25.34				27	2	6.49		
	29	21	46.77	9	50.59		14	12	37.44	9	50.42		29	3	19.43	9	50.59
May	1	22	59.69				16	13	49.54			Dec.	1	4	32.39		
	4	0	12.60				18	15	1.62				3	5	45.37		
	6	1	25.49				20	16	13.70				5	6	58.38		
	8	2	38.37				22	17	25.77				7	8	11.40		
	10	3	51.23	9	50.57		24	18	37.83	9	50.41		9	9	24.44	9	50.61
	12	5	4.08				26	19	49.88				11	10	37.50		
	14	6	16.91				28	21	1.93				13	11	50.58		
	16	7	29.73				30	22	13.97				15	13	3.68		
	18	8	42.53			Sept.	1	23	26.01				17	14	16.80		
	20	9	55.32	9	50.56		4	0	38.04	9	50.41		19	15	29.94	9	50.63
	22	11	8.09				6	1	50.08				21	16	43.09		
	24	12	20.85				8	3	2.11				23	17	56.26		
	26	13	33.59				10	4	14.14				25	19	9.44		
	28	14	46.32				12	5	26.18				27	20	22.64		
	30	15	59.03	9	50.54		14	6	38.23	9	50.41		29	21	35.84	9	50.64
June	1	17	11.72				16	7	50.28				31	22	49.06		

PHEMERIS FOR PHYSICAL OBSERVATIONS OF JUPITER, SYSTEM II.

WASHINGTON MEAN TIME.

Transit of Zero Meridian.		Interval between Successive Transits.	Transit of Zero Meridian.		Interval between Successive Transits.	Transit of Zero Meridian.		Interval between Successive Transits.
	d h m	h m		d h m	h m		d h m	h m
Jan.	1 19 30.35	9 55.85	June	2 15 51.54	9 55.71	Sept.	18 4 55.66	9 55.59
	3 21 9.61			4 17 30.10			20 6 33.61	
	5 22 48.86			6 19 8.64			22 8 11.58	
	8 0 28.12			8 20 47.16			24 9 49.56	
	10 2 7.39			10 22 25.67			26 11 27.56	
	12 3 46.65	9 55.85		13 0 4.16	9 55.70		28 13 5.58	9 55.61
	14 5 25.92			15 1 42.63			30 14 43.62	
	16 7 5.18			17 3 21.08		Oct.	2 16 21.69	
	18 8 44.45			19 4 59.52			4 17 59.78	
	20 10 23.72			21 6 37.94			6 19 37.89	
	22 12 2.98	9 55.85		23 8 16.35	9 55.68		8 21 16.04	9 55.63
	24 13 42.24			25 9 54.74			10 22 54.21	
	26 15 21.51			27 11 33.10			13 0 32.40	
	28 17 0.77			29 13 11.46			15 2 10.63	
	30 18 40.02		July	1 14 49.79			17 3 48.88	
Feb.	1 20 19.28	9 55.85		3 16 28.11	9 55.66		19 5 27.16	9 55.66
				5 18 6.41			21 7 5.47	
				7 19 44.69			23 8 43.81	
Mar.	24 7 51.37	9 55.81		9 21 22.95			25 10 22.18	
	26 9 30.43			11 23 1.19			27 12 0.58	
	28 11 9.48	9 55.81		14 0 39.42	9 55.64		29 13 39.00	9 55.69
	30 12 48.51			16 2 17.63			31 15 17.46	
Apr.	1 14 27.53			18 3 55.82		Nov.	2 16 55.94	
	3 16 6.54			20 5 33.99			4 18 34.45	
	5 17 45.53			22 7 12.15			6 20 13.00	
	7 19 24.51	9 55.80		24 8 50.28	9 55.63		8 21 51.57	9 55.7
	9 21 3.48			26 10 28.41			10 23 30.17	
	11 22 42.44			28 12 6.51			13 1 8.79	
	14 0 21.38			30 13 44.60			15 2 47.45	
	16 2 0.31		Aug.	1 15 22.68			17 4 26.13	
	18 3 39.22	9 55.78		3 17 0.73	9 55.61		19 6 4.84	9 55.74
	20 5 18.12			5 18 38.78			21 7 43.57	
	22 6 57.01			7 20 16.80			23 9 22.33	
	24 8 35.88			9 21 54.82			25 11 1.12	
	26 10 14.74			11 23 32.82			27 12 39.93	
	28 11 53.58	9 55.77		14 1 10.81	9 55.60		29 14 18.76	9 55.77
	30 13 32.40			16 2 48.79		Dec.	1 15 57.62	
May	2 15 11.22			18 4 26.75			3 17 36.50	
	4 16 50.02			20 6 4.72			5 19 15.40	
	6 18 28.80			22 7 42.67			7 20 54.32	
	8 20 7.57	9 55.75		24 9 20.61	9 55.59		9 22 33.26	9 55.79
	10 21 46.32			26 10 58.54			12 0 12.23	
	12 23 25.06			28 12 36.47			14 1 51.21	
	15 1 3.78			30 14 14.39			16 3 30.21	
	17 2 42.48		Sept.	1 15 52.31			18 5 9.23	
	19 4 21.17	9 55.74		3 17 30.22	9 55.58		20 6 48.26	9 55.81
	21 5 59.84			5 19 8.13			22 8 27.31	
	23 7 38.50			7 20 46.04			24 10 6.38	
	25 9 17.14			9 22 23.96			26 11 45.46	
	27 10 55.77			12 0 1.87			28 13 24.56	
	29 12 34.38	9 55.72		14 1 39.79	9 55.58		30 15 3.66	9 55.82
	31 14 12.97			16 3 17.72			32 16 42.78	



APPARENT ORBITS OF THE SATELLITES OF JUPITER AT DATE OF OPPOSITION, SEPTEMBER 16, 1915, AS SEEN IN AN INVERTING TELESCOPE, AND ELONGATED IN THE RATIO OF THREE TO ONE IN THE DIRECTION OF THEIR MINOR AXES.

In the above diagram the central ellipse represents the disk of Jupiter, and the inner orbit is that of Satellite V.

In the diagrams of the configurations of Jupiter's four brighter satellites, pages 635–655, Jupiter is represented by a light disk, ○, in the center of the page, and the relative positions of the satellites at the Washington time stated above the diagrams are indicated by dots. The designation of each satellite is shown by a numeral placed to the right or left of the dot, according as the motion of the satellite at the instant in question is toward the east or toward the west, the motion being always toward the numeral. In constructing the diagrams the latitudes of the satellites are always considered zero, except where two or more of them chance to be at nearly the same distance from the planet, when they are placed one above the other, according to their apparent latitudes. If, at the epoch of any configuration, one or more satellites are projected on the disk of the planet, that phenomenon is indicated by a light disk, ○, at the left-hand side of the page; and if any satellites are invisible on account of being occulted behind the disk of the planet, or eclipsed by its shadow, that circumstance is indicated by a dark disk, ●, at the right-hand side of the page. In both cases the annexed numerals serve to point out which satellites are thus rendered invisible.

MEAN SYNODIC PERIODS OF THE SATELLITES.

	d	h	m	s		d		d	h	m	s		d
I.	1	18	28	35.945	=	1.769 860 48	V.	0	11	57	27.635	=	0.498 236 52
II.	3	13	17	53.735	=	3.554 094 16	VI.					=	266.00
III.	7	3	59	35.854	=	7.166 387 20	VII.					=	276.67
IV.	16	18	5	6.928	=	16.753 552 41							

SATELLITE V.

.SHINGTON MEAN TIME OF EVERY TWENTIETH GREATEST ELONGATION.

	d	h			d	h			d	h			d	h	
	4	16.1	E.	Oct.	2	7.9	E.	July	4	10.1	W.	Sept.	22	14.8	W.
	14	15.2	E.		12	7.0	E.		14	9.2	W.	Oct.	2	13.9	W.
	24	14.3	E.						24	8.3	W.		12	13.0	W.
	3	13.4	E.		22	18.1	E.	Aug.	3	7.4	W.		22	12.1	W.
	13	12.5	E.	Nov.	1	17.2	E.		13	6.5	W.	Nov.	1	11.2	W.
	23	11.6	E.		11	16.3	E.						11	10.4	W.
.	2	10.6	E.		21	15.5	E.		23	17.5	W.		21	9.5	W.
	12	9.7	E.	Dec.	1	14.6	E.	Sept.	2	16.6	W.	Dec.	1	8.7	W.
	22	8.8	E.		11	13.8	E.		12	15.7	W.		11	7.8	W.

WASHINGTON MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE I.

	d	h m		d	h m		d	h m		d	h m
.	1	17 19.5	May	18	2 10.0	Aug.	3	22 52.6	Oct.	20	18 7.1
	3	11 49.8		19	20 39.4		5	17 19.4		22	12 33.9
	5	6 20.1		21	15 8.8		7	11 46.1		24	7 0.7
	7	0 50.4		23	9 38.2		9	6 12.8		26	1 27.6
	8	19 20.7		25	4 7.5		11	0 39.4		27	19 54.6
	10	13 51.0		26	22 36.8		12	19 5.9		29	14 21.6
	12	8 21.4		28	17 6.0		14	13 32.3		31	8 48.8
	14	2 51.8		30	11 35.2		16	7 58.8	Nov.	2	3 16.0
	15	21 22.2	June	1	6 4.3		18	2 25.2		3	21 43.3
	17	15 52.6		3	0 33.4		19	20 51.5		5	16 10.6
	19	10 23.0		4	19 2.4		21	15 17.8		7	10 38.0
	21	4 53.4		6	13 31.4		23	9 44.0		9	5 5.5
	22	23 23.9		8	8 0.3		25	4 10.2		10	23 33.1
				10	2 29.2		26	22 36.4		12	18 0.8
				11	20 58.0		28	17 2.5		14	12 28.6
r.	27	17 41.2		13	15 26.7		30	11 28.6		16	6 56.4
	29	12 11.5		15	9 55.3	Sept.	1	5 54.6		18	1 24.3
	31	6 41.8		17	4 24.0		3	0 20.6		19	19 52.2
r.	2	1 12.1		18	22 52.6		4	18 46.6		21	14 20.3
	3	19 42.4		20	17 21.1		6	13 12.6		23	8 48.4
	5	14 12.6		22	11 49.5		8	7 38.6		25	3 16.6
	7	8 42.8		24	6 17.9		10	2 4.6		26	21 44.9
	9	3 13.0		26	0 46.2		11	20 30.6		28	16 13.3
	10	21 43.2		27	19 14.5		13	14 56.6		30	10 41.7
	12	16 13.3		29	13 42.7		15	9 22.5	Dec.	2	5 10.2
	14	10 43.4	July	1	8 10.9		17	3 48.4		3	23 38.8
	16	5 13.5		3	2 39.0		18	22 14.4		5	18 7.4
	17	23 43.6		4	21 7.0		20	16 40.4		7	12 36.1
	19	18 13.6		6	15 34.9		22	11 6.4		9	7 4.9
	21	12 43.7		8	10 2.8		24	5 32.4		11	1 33.8
	23	7 13.7		10	4 30.6		25	23 58.4		12	20 2.7
	25	1 43.6		11	22 58.3		27	18 24.4		14	14 31.6
	26	20 13.5		13	17 25.9		29	12 50.5		16	9 0.6
	28	14 43.4		15	11 53.5	Oct.	1	7 16.6		18	3 29.7
	30	9 13.2		17	6 21.1		3	1 42.8		19	21 58.9
ay	2	3 43.1		19	0 48.6		4	20 9.0		21	16 28.1
	3	22 12.9		20	19 16.0		6	14 35.2		23	10 57.4
	5	16 42.7		22	13 43.3		8	9 1.5		25	5 26.7
	7	11 12.4		24	8 10.5		10	3 27.8		26	23 56.1
	9	5 42.1		26	2 37.7		11	21 54.2		28	18 25.6
	11	0 11.7		27	21 4.8		13	16 20.7		30	12 55.1
	12	18 41.3		29	15 31.9		15	10 47.2			
	14	13 10.9		31	9 58.9		17	5 13.8			
	16	7 40.5	Aug.	2	4 25.8		18	23 40.4			

WASHINGTON MEAN TIME OF SUPERIOR GEOCENTRIC CONJUNCTION.

SATELLITE II.

	d	h	m		d	h	m		d	h	m		d	h	m
Jan.	3	11	50.8	May	18	17	45.4	Aug.	4	21	33.6	Oct.	21	22	24.0
	7	1	15.9		22	7	6.2		8	10	43.2		25	11	34.3
	10	14	42.2		25	20	26.8		11	23	52.5		29	0	44.9
	14	4	7.7		29	9	46.9		15	13	1.3	Nov.	1	13	56.4
	17	17	34.3	June	1	23	6.4		19	2	9.7		5	3	8.1
	21	7	0.0		5	12	25.6		22	15	17.7		8	16	20.9
					9	1	44.3		26	4	25.4		12	5	33.8
					12	15	2.6		29	17	32.7		15	18	47.9
Mar.	29	22	18.7		16	4	20.4	Sept.	2	6	39.8		19	8	2.3
Apr.	2	11	43.6		19	17	37.7		5	19	46.7		22	21	17.8
	6	1	8.6		23	6	54.5		9	8	53.4		26	10	33.4
	9	14	33.1		26	20	10.7		12	21	59.9		29	23	50.1
	13	3	57.7		30	9	26.4		16	11	6.3	Dec.	3	13	7.0
	16	17	21.6	July	3	22	41.7		20	0	12.9		7	2	25.0
	20	6	45.7		7	11	56.3		23	13	19.6		10	15	43.1
	23	20	9.1		11	1	10.5		27	2	26.5		14	5	2.5
	27	9	32.6		14	14	24.0		30	15	33.6		17	18	21.7
	30	22	55.4		18	3	37.0	Oct.	4	4	41.0		21	7	42.2
May	4	12	18.2		21	16	49.4		7	17	48.7		24	21	2.5
	8	1	40.4		25	6	1.3		11	6	56.9		28	10	24.1
	11	15	2.5		28	19	12.6		14	20	5.4		31	23	45.2
	15	4	24.1	Aug.	1	8	23.4		18	9	14.5				

SATELLITE III.

	d	h	m		d	h	m		d	h	m		d	h	m
Jan.	5	7	0.4	May	14	15	29.0	Aug.	1	10	56.1	Oct.	18	23	41.9
	12	11	28.4		21	19	44.4		8	14	26.8		26	3	9.9
	19	15	57.3		28	23	57.0		15	17	53.2	Nov.	2	6	42.6
				June	5	4	6.5		22	21	15.5		9	10	20.6
					12	8	13.0		30	0	34.8		16	14	3.2
Apr.	1	13	6.9		19	12	15.2	Sept.	6	3	52.1		23	17	50.8
	8	17	35.0		26	16	13.4		13	7	8.0		30	21	43.0
	15	22	1.5	July	3	20	6.9		20	10	24.1	Dec.	8	1	40.1
	23	2	27.0		10	23	55.7		27	13	40.3		15	5	42.2
	30	6	49.9		18	3	40.5	Oct.	4	16	58.1		22	9	48.4
May	7	11	10.9		25	7	20.3		11	20	18.1		29	13	59.0

SATELLITE IV.

	d	h	m		d	h	m		d	h	m		d	h	m
Jan.	16	17	19.2	May	14	18	5.9	Aug.	6	10	44.4	Oct.	28	11	39.6
					31	13	28.5		23	1	44.1	Nov.	14	3	42.2
				June	17	8	8.5	Sept.	8	16	4.7		30	20	48.5
Apr.	11	1	45.1	July	4	1	59.0		25	6	11.7	Dec.	17	14	54.0
	27	22	8.8		20	18	51.3	Oct.	11	20	35.1				

DIFFERENTIAL COORDINATES OF SATELLITE VI.

ng- ean n.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Washington Mean Noon.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$	Washington Mean Noon.	$\alpha_{VI}-\alpha_{Jup.}$	$\delta_{VI}-\delta_{Jup.}$
	m s	′		m s	′		m s	′
0	+1 6	−12.7	June 26	+2 54	−7.7	Oct. 4	+1 11	+0.2
4	0 52	11.9	30	3 10	7.9	8	0 43	0.7
8	0 38	11.1	July 4	3 26	8.0	12	+0 15	1.2
12	+0 24	−10.2	8	3 41	8.1	16	−0 12	1.7
	. . .	. . .	12	3 55	8.1	20	0 38	2.2
7	−2 27	+ 4.6	16	+4 8	−8.0	24	−1 3	+2.7
11	2 21	4.3	20	4 20	7.8	28	1 27	3.2
15	2 13	3.9	24	4 29	7.6	Nov. 1	1 49	3.7
19	2 3	3.4	28	4 37	7.3	5	2 8	4.2
23	1 52	2.9	Aug. 1	4 44	7.0	9	2 26	4.6
27	−1 39	+ 2.2	5	+4 48	−6.6	13	−2 40	+5.0
1	1 24	1.5	9	4 50	6.2	17	2 52	5.3
5	1 9	+ 0.7	13	4 49	5.7	21	3 1	5.5
9	0 52	− 0.1	17	4 46	5.3	25	3 8	5.6
13	0 35	1.0	21	4 41	4.8	29	3 11	5.6
17	−0 17	− 1.8	25	+4 33	−4.3	Dec. 3	−3 11	+5.5
21	+0 2	2.6	29	4 23	3.8	7	3 9	5.3
25	0 21	3.4	Sept. 2	4 10	3.3	11	3 4	5.0
29	0 41	4.2	6	3 54	2.9	15	2 56	4.6
e 2	1 0	4.9	10	3 36	2.4	19	2 46	4.1
6	+1 20	− 5.5	14	+3 16	−2.0	23	−2 35	+3.5
10	1 39	6.1	18	2 54	1.6	27	2 21	2.8
14	1 58	6.7	22	2 30	1.2	31	−2 6	+2.0
18	2 17	7.1	26	2 5	0.7			
22	+2 36	− 7.5	30	+1 38	−0.3			

DIFFERENTIAL COORDINATES OF SATELLITE VII.

shing- Mean oon.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Washington Mean Noon.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$	Washington Mean Noon.	$\alpha_{VII}-\alpha_{Jup.}$	$\delta_{VII}-\delta_{Jup.}$
	m s	′		m s	′		m s	′
n. 0	+1 27	+28.4	June 26	−4 18	− 2.1	Oct. 4	+1 17	+29.1
4	1 36	27.8	30	4 21	− 0.6	8	1 38	28.6
8	1 44	27.1	July 4	4 24	+ 0.9	12	1 57	27.8
12	1 51	+26.3	8	4 25	2.5	16	2 15	26.7
	. . .	. . .	12	4 25	4.1	20	2 31	25.4
pr. 7	+0 45	−12.2	16	−4 23	+ 5.8	24	+2 46	+23.8
11	0 25	13.5	20	4 20	7.6	28	2 59	22.0
15	+0 5	14.6	24	4 15	9.4	Nov. 1	3 9	19.9
19	−0 16	15.4	28	4 9	11.2	5	3 17	17.5
23	0 37	16.0	Aug. 1	4 0	13.0	9	3 22	15.0
27	−0 57	−16.4	5	−3 50	+14.8	13	+3 25	+12.3
ay 1	1 18	16.5	9	3 38	16.7	17	3 24	9.4
5	1 38	16.3	13	3 23	18.4	21	3 21	6.5
9	1 57	15.9	17	3 7	20.1	25	3 14	3.6
13	2 15	15.3	21	2 49	21.6	29	3 4	+ 0.8
17	−2 33	−14.6	25	−2 30	+23.1	Dec. 3	+2 51	− 2.0
21	2 49	13.6	29	2 9	24.4	7	2 35	4.6
25	3 4	12.6	Sept. 2	1 47	25.6	11	2 17	7.0
29	3 18	11.4	6	1 24	26.7	15	1 57	9.1
une 2	3 30	10.2	10	1 1	27.6	19	1 36	11.0
6	−3 41	− 8.9	14	−0 37	+28.3	23	+1 14	−12.5
10	3 51	7.6	18	−0 13	28.9	27	0 51	13.8
14	3 59	6.3	22	+0 10	29.2	31	+0 27	−14.8
18	4 7	4.9	26	0 33	29.4			
22	−4 13	− 3.5	30	+0 56	+29.3			

WASHINGTON MEAN TIME.

JANUARY.

d	h	m	s				d	h	m	s				d	h	m	s			
1	14	52		III.	Tr.	In.	8	21	14	53	I.	Ec.	Re.	16	17	29		I.	Tr.	In.
	15	40		II.	Tr.	In.		21	24		II.	Tr.	Eg.		18	9		I.	Sh.	In.
	16	9		I.	Oc.	Dis.		22	31		III.	Sh.	In.		19	46		IV.	Oc.	Re.
	17	25		II.	Sh.	In.		22	56		II.	Sh.	Eg.		19	50		I.	Tr.	Eg.
	18	29		III.	Sh.	In.		23	0		III.	Tr.	Eg.		20	29		I.	Sh.	Eg.
	18	33		III.	Tr.	Eg.	9	2	7		III.	Sh.	Eg.		21	14	26	IV.	Ec.	Dis.
	18	36		II.	Tr.	Eg.		15	27		I.	Tr.	In.	17	1	43	7	IV.	Ec.	Re.
	19	19	57	I.	Ec.	Re.		16	13		I.	Sh.	In.		14	42		I.	Oc.	Dis.
	20	21		II.	Sh.	Eg.		17	47		I.	Tr.	Eg.		16	6		II.	Oc.	Dis.
	22	6		III.	Sh.	Eg.		18	33		I.	Sh.	Eg.		17	38	30	I.	Ec.	Re.
2	13	25		I.	Tr.	In.	10	12	41		I.	Oc.	Dis.		20	19	22	II.	Ec.	Re.
	14	18		I.	Sh.	In.		13	14		II.	Oc.	Dis.	18	12	0		I.	Tr.	In.
	15	46		I.	Tr.	Eg.		15	43	38	I.	Ec.	Re.		12	38		I.	Sh.	In.
	16	38		I.	Sh.	Eg.		17	41	4	II.	Ec.	Re.		14	20		I.	Tr.	Eg.
3	10	23		II.	Oc.	Dis.	11	9	58		I.	Tr.	In.		14	58		I.	Sh.	Eg.
	10	40		I.	Oc.	Dis.		10	42		I.	Sh.	In.	19	9	13		I.	Oc.	Dis.
	13	48	42	I.	Ec.	Re.		12	18		I.	Tr.	Eg.		10	40		II.	Tr.	In.
	15	2	40	II.	Ec.	Re.		13	2		I.	Sh.	Eg.		11	53		II.	Sh.	In.
4	7	56		I.	Tr.	In.	12	7	11		I.	Oc.	Dis.		12	7	11	I.	Ec.	Re.
	8	47		I.	Sh.	In.		7	52		II.	Tr.	In.		13	37		II.	Tr.	Eg.
	10	16		I.	Tr.	Eg.		9	18		II.	Sh.	In.		14	7		III.	Oc.	Dis.
	11	7		I.	Sh.	Eg.		9	38		III.	Oc.	Dis.		14	49		II.	Sh.	Eg.
5	5	4		II.	Tr.	In.		10	12	20	I.	Ec.	Re.		20	8	26	III.	Ec.	Re.
	5	10		III.	Oc.	Dis.		10	48		II.	Tr.	Eg.	20	6	30		I.*	Tr.	In.
	5	10		I.	Oc.	Dis.		12	14		II.	Sh.	Eg.		7	7		I.	Sh.	In.
	6	42		II.*	Sh.	In.		16	7	34	III.	Ec.	Re.		8	50		I.	Tr.	Eg.
	8	0		II.	Tr.	Eg.	13	4	28		I.	Tr.	In.		9	26		I.	Sh.	Eg.
	8	17	25	I.	Ec.	Re.		5	11		I.	Sh.	In.	21	3	43		I.	Oc.	Dis.
	9	38		II.	Sh.	Eg.		6	48		I.*	Tr.	Eg.		5	32		II.	Oc.	Dis.
	12	6	5	III.	Ec.	Re.		7	31		I.	Sh.	Eg.		6	35	52	I.*	Ec.	Re.
6	2	26		I.	Tr.	In.	14	1	42		I.	Oc.	Dis.		9	37	55	II.	Ec.	Re.
	3	16		I.	Sh.	In.		2	40		II.	Oc.	Dis.	22	1	1		I.	Tr.	In.
	4	46		I.	Tr.	Eg.		4	41	2	I.	Ec.	Re.		1	35		I.	Sh.	In.
	5	36		I.*	Sh.	Eg.		6	59	41	II.*	Ec.	Re.		3	21		I.	Tr.	Eg.
	23	40		I.	Oc.	Dis.		22	59		I.	Tr.	In.		3	55		I.	Sh.	Eg.
	23	48		II.	Oc.	Dis.		23	40		I.	Sh.	In.		22	14		I.	Oc.	Dis.
7	2	46	9	I.	Ec.	Re.	15	1	19		I.	Tr.	Eg.	23	0	5		II.	Tr.	In.
	4	21	19	II.	Ec.	Re.		2	0		I.	Sh.	Eg.		1	4	34	I.	Ec.	Re.
	20	57		I.	Tr.	In.		20	12		I.	Oc.	Dis.		1	11		II.	Sh.	In.
	21	45		I.	Sh.	In.		21	16		II.	Tr.	In.		3	1		II.	Tr.	Eg.
	23	17		I.	Tr.	Eg.		22	36		II.	Sh.	In.		4	7		II.	Sh.	Eg.
8	0	4		I.	Sh.	Eg.		23	9	46	I.	Ec.	Re.		4	18		III.	Tr.	In.
	5	24		IV.	Tr.	In.		23	48		III.	Tr.	In.		6	34		III.*	Sh.	In.
	10	19		IV.	Tr.	Eg.	16	0	12		II.	Tr.	Eg.		7	57		III.	Tr.	Eg.
	13	3		IV.	Sh.	In.		1	32		II.	Sh.	Eg.		10	9		III.	Sh.	Eg.
	17	48		IV.	Sh.	Eg.		2	33		III.	Sh.	In.		19	32		I.	Tr.	In.
	18	11		I.	Oc.	Dis.		3	28		III.	Tr.	Eg.		20	4		I.	Sh.	In.
	18	28		II.	Tr.	In.		6	8		III.*	Sh.	Eg.		21	52		I.	Tr.	Eg.
	19	19		III.	Tr.	In.		14	52		IV.	Oc.	Dis.		22	24		I.	Sh.	Eg.
	20	0		II.	Sh.	In.														

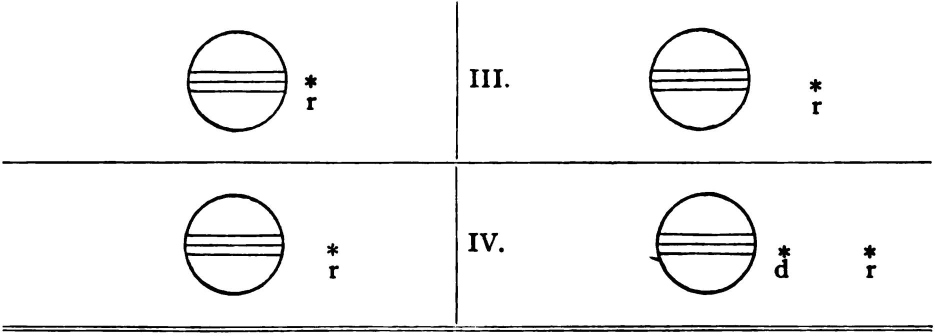
By reason of the proximity of JUPITER to the SUN the phenomena of the satellites are not given from January 24 to March 26.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

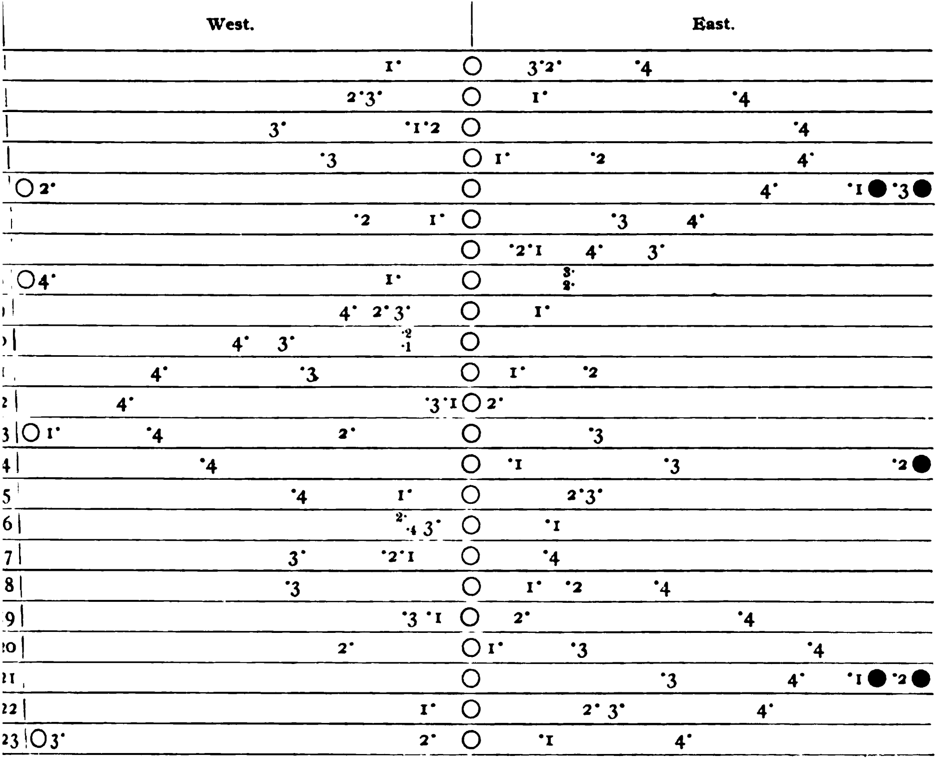
WASHINGTON MEAN TIME.

JANUARY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at $6^h\ 15^m$ for an Inverting Telescope.



MARCH.

By reason of the proximity of JUPITER to the SUN the phenomena of the satellites are not given from January 24 to March 26.

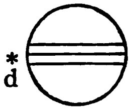
d	h	m	s			
27	16	0	46	I.	Ec.	Dis.
	18	51		I.	Oc.	Re.
28	0	31		II.	Sh.	In.
	1	38		II.	Tr.	In.
	3	26		II.	Sh.	Eg.
	4	33		II.	Tr.	Eg.
	13	19		I.	Sh.	In.
	13	53		I.	Tr.	In.
	15	38		I.	Sh.	Eg.
	16	12		I.	Tr.	Eg.
28	18	48		III.	Sh.	In.
	21	8		III.	Tr.	In.
	22	16		III.	Sh.	Eg.
29	0	36		III.	Tr.	Eg.
	10	29	24	I.	Ec.	Dis.
	13	21		I.	Oc.	Re.
	19	42	9	II.	Ec.	Dis.
	23	46		II.	Oc.	Re.
30	7	48		I.	Sh.	In.
30	8	23		I.	Tr.	In.
	10	7		I.	Sh.	Eg.
	10	42		I.	Tr.	Eg.
31	4	57	56	I.	Ec.	Dis.
	7	51		I.	Oc.	Re.
	13	49		II.	Sh.	In.
	15	3		II.	Tr.	In.
	16	44		II.	Sh.	Eg.
	17	58		II.	Tr.	Eg.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

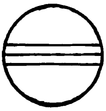
WASHINGTON MEAN TIME.

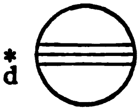
MARCH.

Phases of the Eclipses of the Satellites for an Inverting Telescope.

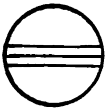


III. No Eclipse.

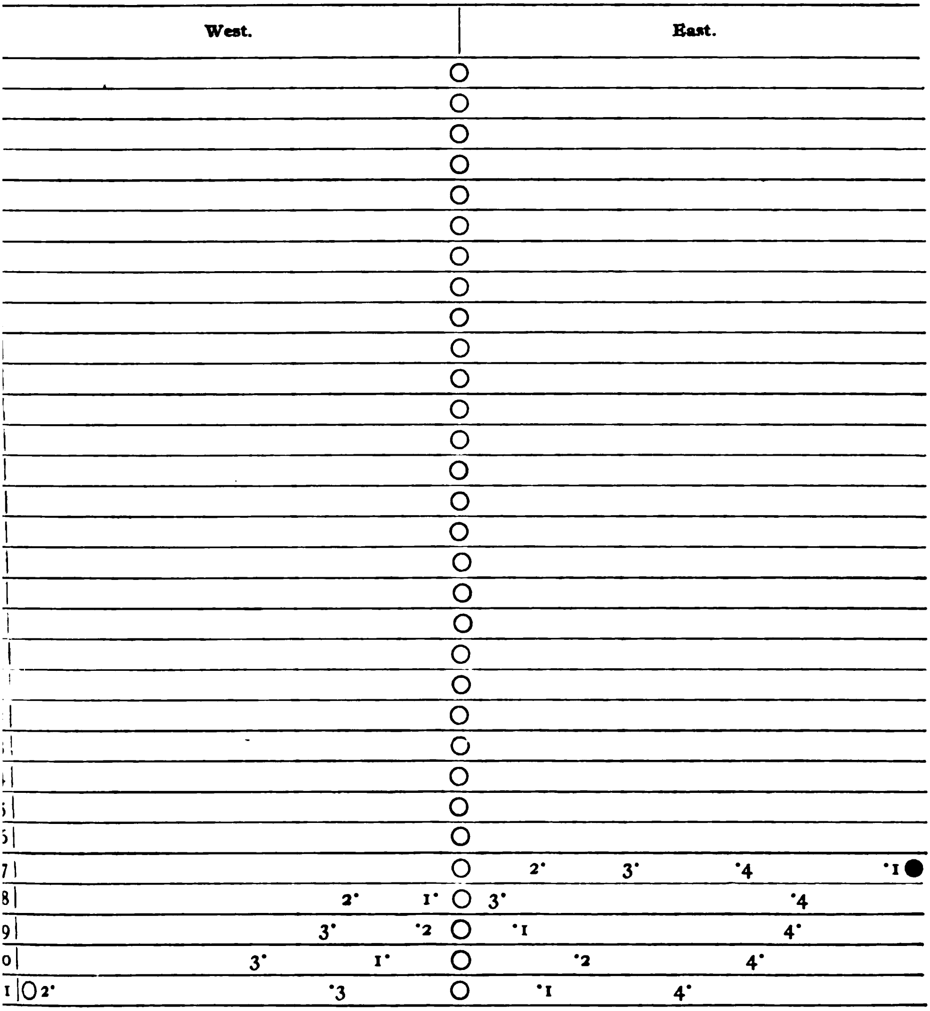




IV. No Eclipse.



Configurations at 17h 15m for an Inverting Telescope.



WASHINGTON MEAN TIME.

APRIL.

d	h	m	s			
1	2	16		I.	Sh.	In.
	2	54		I.	Tr.	In.
	4	35		I.	Sh.	Eg.
	5	13		I.	Tr.	Eg.
	8	54	4	III.	Ec.	Dis.
	14	50		III.	Oc.	Re.
	23	26	32	I.	Ec.	Dis.
2	2	22		I.	Oc.	Re.
	8	23		IV.	Sh.	In.
	9	0	9	II.	Ec.	Dis.
	12	47		IV.	Sh.	Eg.
	13	11		II.	Oc.	Re.
	14	38		IV.	Tr.	In.
	19	0		IV.	Tr.	Eg.
	20	45		I.	Sh.	In.
	21	24		I.	Tr.	In.
	23	4		I.	Sh.	Eg.
	23	43		I.	Tr.	Eg.
3	17	55	3	I.	Ec.	Dis.
	20	52		I.	Oc.	Re.
4	3	7		II.	Sh.	In.
	4	28		II.	Tr.	In.
	6	2		II.	Sh.	Eg.
	7	23		II.	Tr.	Eg.
	15	13		I.	Sh.	In.
	15	54		I.	Tr.	In.
	17	32		I.	Sh.	Eg.
	18	13		I.	Tr.	Eg.
	22	49		III.	Sh.	In.
5	1	38		III.	Tr.	In.
	2	17		III.	Sh.	Eg.
	5	4		III.	Tr.	Eg.
	12	23	40	I.	Ec.	Dis.
	15	22		I.	Oc.	Re.
	22	18	34	II.	Ec.	Dis.
6	2	36		II.	Oc.	Re.
	9	42		I.	Sh.	In.
	10	25		I.	Tr.	In.
	12	1		I.	Sh.	Eg.
	12	44		I.	Tr.	Eg.
7	6	52	12	I.	Ec.	Dis.
	9	52		I.	Oc.	Re.
	16	24		II.	Sh.	In.
	17	53		II.	Tr.	In.
	19	19		II.	Sh.	Eg.
	20	47		II.	Tr.	Eg.
8	4	10		I.	Sh.	In.
	4	55		I.	Tr.	In.
	6	30		I.	Sh.	Eg.
	7	14		I.	Tr.	Eg.
	12	54	56	III.	Ec.	Dis.
	19	17		III.	Oc.	Re.
9	1	20	46	I.	Ec.	Dis.
	4	22		I.	Oc.	Re.
	11	36	30	II.	Ec.	Dis.
	16	0		II.	Oc.	Re.
	22	39		I.	Sh.	In.
	23	25		I.	Tr.	In.
10	0	58		I.	Sh.	Eg.
	1	44		I.	Tr.	Eg.
	16	22	40	IV.	Ec.	Dis.
	19	49	17	I.	Ec.	Dis.
	20	28	57	IV.	Ec.	Re.
	22	53		I.	Oc.	Re.
	23	38		IV.	Oc.	Dis.
11	3	52		IV.	Oc.	Re.

d	h	m	s			
11	5	43		II.	Sh.	In.
	7	18		II.	Tr.	In.
	8	38		II.	Sh.	Eg.
	10	12		II.	Tr.	Eg.
	17	8		I.	Sh.	In.
	17	55		I.	Tr.	In.
	19	27		I.	Sh.	Eg.
	20	14		I.	Tr.	Eg.
12	2	50		III.	Sh.	In.
	6	6		III.	Tr.	In.
	6	17		III.	Sh.	Eg.
	9	30		III.	Tr.	Eg.
	14	17	54	I.	Ec.	Dis.
	17	23		I.	Oc.	Re.
13	0	54	47	II.	Ec.	Dis.
	5	25		II.	Oc.	Re.
	11	36		I.	Sh.	In.
	12	25		I.	Tr.	In.
	13	55		I.	Sh.	Eg.
	14	44		I.	Tr.	Eg.
14	8	46	25	I.	Ec.	Dis.
	11	53		I.	Oc.	Re.
	19	0		II.	Sh.	In.
	20	42		II.	Tr.	In.
	21	55		II.	Sh.	Eg.
	23	36		II.	Tr.	Eg.
15	6	5		I.	Sh.	In.
	6	55		I.	Tr.	In.
	8	24		I.	Sh.	Eg.
	9	14		I.	Tr.	Eg.
	16	55	46	III.	Ec.	Dis.
	20	12	18	III.	Ec.	Re.
	20	20		III.	Oc.	Dis.
	23	43		III.	Oc.	Re.
16	3	14	59	I.	Ec.	Dis.
	6	23		I.	Oc.	Re.
	14	12	38	II.	Ec.	Dis.
	18	49		II.	Oc.	Re.
17	0	33		I.	Sh.	In.
	1	26		I.	Tr.	In.
	2	52		I.	Sh.	Eg.
	3	44		I.	Tr.	Eg.
	21	43	29	I.	Ec.	Dis.
18	0	53		I.	Oc.	Re.
	8	19		II.	Sh.	In.
	10	7		II.	Tr.	In.
	11	13		II.	Sh.	Eg.
	13	0		II.	Tr.	Eg.
	19	2		I.	Sh.	In.
	19	56		I.	Tr.	In.
	21	21		I.	Sh.	Eg.
	22	14		I.	Tr.	Eg.
19	2	38		IV.	Sh.	In.
	6	51		III.	Sh.	In.
	6	56		IV.	Sh.	Eg.
	10	17		III.	Sh.	Eg.
	10	33		III.	Tr.	In.
	11	24		IV.	Tr.	In.
	13	55		III.	Tr.	Eg.
	15	30		IV.	Tr.	Eg.
	16	12	5	I.	Ec.	Dis.
	19	23		I.	Oc.	Re.
20	3	30	46	II.	Ec.	Dis.
	8	13		II.	Oc.	Re.
	13	30		I.	Sh.	In.
	14	26		I.	Tr.	In.

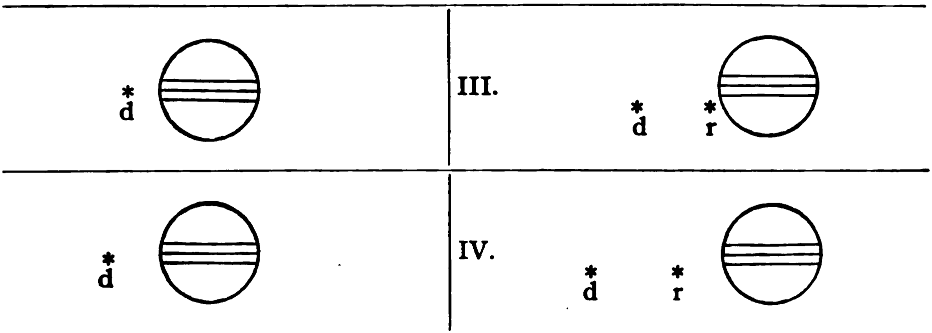
d	h	m	s			
20	15	49		I.	Sh.	Eg.
	16	44		I.*	Tr.	Eg.
21	10	40	36	I.	Ec.	Dis.
	13	53		I.	Oc.	Re.
	21	37		II.	Sh.	In.
	23	31		II.	Tr.	In.
22	0	31		II.	Sh.	Eg.
	2	24		II.	Tr.	Eg.
	7	59		I.	Sh.	In.
	8	56		I.	Tr.	In.
	10	18		I.	Sh.	Eg.
	11	14		I.	Tr.	Eg.
	20	57	12	III.	Ec.	Dis.
23	0	12	53	III.	Ec.	Re.
	0	47		III.	Oc.	Dis.
	4	7		III.	Oc.	Re.
	5	9	10	I.	Ec.	Dis.
	8	23		I.	Oc.	Re.
	16	48	33	II.	Ec.	Dis.
	21	36		II.	Oc.	Re.
24	2	27		I.	Sh.	In.
	3	26		I.	Tr.	In.
	4	46		I.	Sh.	Eg.
	5	44		I.	Tr.	Eg.
	23	37	39	I.	Ec.	Dis.
25	2	53		I.	Oc.	Re.
	10	55		II.	Sh.	In.
	12	55		II.	Tr.	In.
	13	49		II.	Sh.	Eg.
	15	48		II.	Tr.	Eg.
	20	56		I.	Sh.	In.
	21	56		I.	Tr.	In.
	23	15		I.	Sh.	Eg.
26	0	14		I.	Tr.	Eg.
	10	51		III.	Sh.	In.
	14	16		III.	Sh.	Eg.
	14	58		III.	Tr.	In.
	18	6	15	I.	Ec.	Dis.
	18	17		III.	Tr.	Eg.
	21	23		I.	Oc.	Re.
27	6	6	33	II.	Ec.	Dis.
	10	36	1	IV.	Ec.	Dis.
	10	59		II.	Oc.	Re.
	14	36	31	IV.	Ec.	Re.
	15	24		I.	Sh.	In.
	16	26		I.*	Tr.	In.
	17	43		I.	Sh.	Eg.
	18	44		I.	Tr.	Eg.
	20	10		IV.	Oc.	Dis.
28	0	8		IV.	Oc.	Re.
	12	34	45	I.	Ec.	Dis.
	15	53		I.*	Oc.	Re.
29	0	13		II.	Sh.	In.
	2	19		II.	Tr.	In.
	3	7		II.	Sh.	Eg.
	5	12		II.	Tr.	Eg.
	9	53		I.	Sh.	In.
	10	55		I.	Tr.	In.
	12	12		I.	Sh.	Eg.
	13	14		I.	Tr.	Eg.
30	0	58	2	III.	Ec.	Dis.
	4	12	50	III.	Ec.	Re.
	5	11		III.	Oc.	Dis.
	7	3	19	I.	Ec.	Dis
	8	29		III.	Oc.	Re.
	10	22		I.	Oc.	Re.
	19	24	15	II.	Ec.	Dis

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

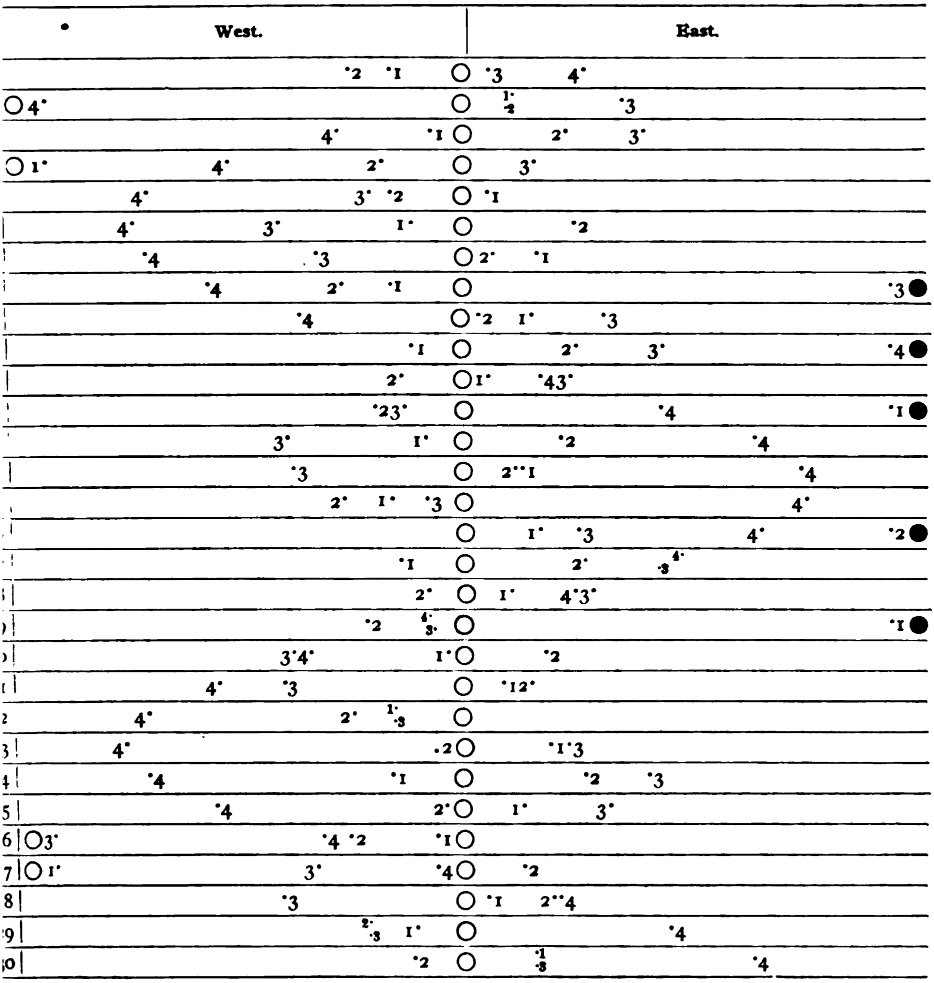
WASHINGTON MEAN TIME.

APRIL.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 16ʰ 45ᵐ for an Inverting Telescope.



WASHINGTON MEAN TIME.

MAY.

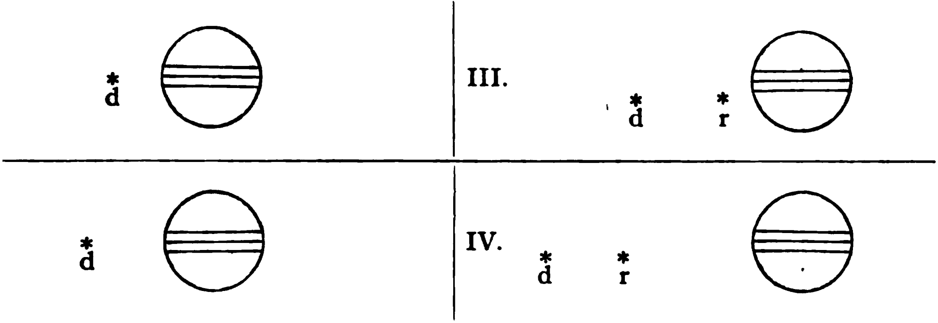
d	h	m	s			
1	0	22		II.	Oc.	Re.
	4	21		I.	Sh.	In.
	5	25		I.	Tr.	In.
	6	40		I.	Sh.	Eg.
	7	44		I.	Tr.	Eg.
2	1	31	48	I.	Ec.	Dis.
	4	52		I.	Oc.	Re.
	13	31		II.	Sh.	In.
	15	42		II.*	Tr.	In.
	16	26		II.*	Sh.	Eg.
	18	35		II.	Tr.	Eg.
	22	50		I.	Sh.	In.
	23	55		I.	Tr.	In.
3	1	9		I.	Sh.	Eg.
	2	13		I.	Tr.	Eg.
	14	52		III.	Sh.	In.
	18	16		III.	Sh.	Eg.
	19	21		III.	Tr.	In.
	20	0	24	I.	Ec.	Dis.
	22	38		III.	Tr.	Eg.
	23	22		I.	Oc.	Re.
4	8	42	8	II.	Ec.	Dis.
	13	45		II.	Oc.	Re.
	17	18		I.	Sh.	In.
	18	25		I.	Tr.	In.
	19	37		I.	Sh.	Eg.
	20	43		I.	Tr.	Eg.
5	14	28	54	I.	Ec.	Dis.
	17	52		I.	Oc.	Re.
	20	53		IV.	Sh.	In.
6	1	6		IV.	Sh.	Eg.
	2	49		II.	Sh.	In.
	5	6		II.	Tr.	In.
	5	43		II.	Sh.	Eg.
	7	48		IV.	Tr.	In.
	7	58		II.	Tr.	Eg.
	11	37		IV.	Tr.	Eg.
	11	47		I.	Sh.	In.
	12	54		I.	Tr.	In.
	14	6		I.	Sh.	Eg.
	15	13		I.	Tr.	Eg.
7	4	58	54	III.	Ec.	Dis.
	8	12	49	III.	Ec.	Re.
	8	57	28	I.	Ec.	Dis.
	9	33		III.	Oc.	Dis.
	12	22		I.	Oc.	Re.
	12	49		III.	Oc.	Re.
	21	59	46	II.	Ec.	Dis.
8	3	7		II.	Oc.	Re.
	6	16		I.	Sh.	In.
	7	24		I.	Tr.	In.
	8	34		I.	Sh.	Eg.
	9	42		I.	Tr.	Eg.
9	3	25	56	I.	Ec.	Dis.
	6	51		I.	Oc.	Re.
	16	8		II.*	Sh.	In.
	18	29		II.	Tr.	In.
	19	2		II.	Sh.	Eg.
	21	22		II.	Tr.	Eg.
10	0	44		I.	Sh.	In.
	1	54		I.	Tr.	In.
	3	3		I.	Sh.	Eg.
	4	12		I.	Tr.	Eg.
	18	53		III.	Sh.	In.
	21	54	32	I.	Ec.	Dis.
	22	16		III.	Sh.	Eg.
10	23	42		III.	Tr.	In.
11	1	21		I.	Oc.	Re.
	2	56		III.	Tr.	Eg.
	11	17	31	II.	Ec.	Dis.
	16	29		II.	Oc.	Re.
	19	12		I.	Sh.	In.
	20	23		I.	Tr.	In.
	21	31		I.	Sh.	Eg.
	22	42		I.	Tr.	Eg.
12	16	23	1	I.	Ec.	Dis.
	19	50		I.	Oc.	Re.
13	5	26		II.	Sh.	In.
	7	52		II.	Tr.	In.
	8	20		II.	Sh.	Eg.
	10	44		II.	Tr.	Eg.
	13	41		I.	Sh.	In.
	14	53		I.*	Tr.	In.
	16	0		I.*	Sh.	Eg.
	17	11		I.	Tr.	Eg.
14	4	49	44	IV.	Ec.	Dis.
	8	43	47	IV.	Ec.	Re.
	8	59	21	III.	Ec.	Dis.
	10	51	35	I.	Ec.	Dis.
	12	12	21	III.	Ec.	Re.
	13	53		III.	Oc.	Dis.
	14	20		I.	Oc.	Re.
	16	16		IV.*	Oc.	Dis.
	17	5		III.	Oc.	Re.
	19	55		IV.	Oc.	Re.
15	0	35	5	II.	Ec.	Dis.
	5	50		II.	Oc.	Re.
	8	9		I.	Sh.	In.
	9	22		I.	Tr.	In.
	10	28		I.	Sh.	Eg.
	11	40		I.	Tr.	Eg.
16	5	20	3	I.	Ec.	Dis.
	8	50		I.	Oc.	Re.
	18	44		II.	Sh.	In.
	21	14		II.	Tr.	In.
	21	38		II.	Sh.	Eg.
17	0	6		II.	Tr.	Eg.
	2	38		I.	Sh.	In.
	3	52		I.	Tr.	In.
	4	56		I.	Sh.	Eg.
	6	10		I.	Tr.	Eg.
	22	54		III.	Sh.	In.
	23	48	39	I.	Ec.	Dis.
18	2	16		III.	Sh.	Eg.
	3	19		I.	Oc.	Re.
	4	1		III.	Tr.	In.
	7	12		III.	Tr.	Eg.
	13	52	44	II.	Ec.	Dis.
	19	12		II.	Oc.	Re.
	21	6		I.	Sh.	In.
	22	21		I.	Tr.	In.
	23	25		I.	Sh.	Eg.
19	0	39		I.	Tr.	Eg.
	18	17	8	I.	Ec.	Dis.
	21	48		I.	Oc.	Re.
20	8	2		II.	Sh.	In.
	10	36		II.	Tr.	In.
	10	56		II.	Sh.	Eg.
	13	28		II.	Tr.	Eg.
	15	35		I.*	Sh.	In.
	16	51		I.	Tr.	In.
	17	53		I.	Sh.	Eg.
20	19	8		I.	Tr.	Eg.
21	12	45	42	I.	Ec.	Dis.
	12	59	47	III.	Ec.	Dis.
	16	11	50	III.*	Ec.	Re.
	16	18		I.	Oc.	Re.
	18	9		III.	Oc.	Dis.
	21	20		III.	Oc.	Re.
22	3	10	14	II.	Ec.	Dis.
	8	32		II.	Oc.	Re.
	10	3		I.	Sh.	In.
	11	20		I.	Tr.	In.
	12	22		I.	Sh.	Eg.
	13	38		I.	Tr.	Eg.
	15	9		IV.*	Sh.	In.
	19	15		IV.	Sh.	Eg.
23	3	42		IV.	Tr.	In.
	7	11		IV.	Tr.	Eg.
	7	14	10	I.	Ec.	Dis.
	10	47		I.	Oc.	Re.
	21	21		II.	Sh.	In.
	23	58		II.	Tr.	In.
24	0	15		II.	Sh.	Eg.
	2	50		II.	Tr.	Eg.
	4	32		I.	Sh.	In.
	5	49		I.	Tr.	In.
	6	50		I.	Sh.	Eg.
	8	7		I.	Tr.	Eg.
25	1	42	45	I.	Ec.	Dis.
	2	55		III.	Sh.	In.
	5	16		I.	Oc.	Re.
	6	16		III.	Sh.	Eg.
	8	16		III.	Tr.	In.
	11	25		III.	Tr.	Eg.
	16	27	46	II.	Ec.	Dis.
	21	53		II.	Oc.	Re.
	23	0		I.	Sh.	In.
26	0	18		I.	Tr.	In.
	1	19		I.	Sh.	Eg.
	2	36		I.	Tr.	Eg.
	20	11	15	I.	Ec.	Dis.
	23	46		I.	Oc.	Re.
27	10	39		II.	Sh.	In.
	13	20		II.	Tr.	In.
	13	33		II.	Sh.	Eg.
	16	11		II.	Tr.	Eg.
	17	28		I.	Sh.	In.
	18	48		I.	Tr.	In.
	19	47		I.	Sh.	Eg.
	21	5		I.	Tr.	Eg.
28	14	39	49	I.*	Ec.	Dis.
	17	0	34	III.	Ec.	Dis.
	18	15		I.	Oc.	Re.
	20	11	39	III.	Ec.	Re.
	22	23		III.	Oc.	Dis.
29	1	31		III.	Oc.	Re.
	5	45	13	II.	Ec.	Dis.
	11	13		II.	Oc.	Re.
	11	57		I.	Sh.	In.
	13	17		I.	Tr.	In.
	14	16		I.*	Sh.	Eg.
	15	34		I.*	Tr.	Eg.
30	9	8	17	I.	Ec.	Dis.
	12	44		I.	Oc.	Re.
	23	3	39	IV.	Ec.	Dis.
	23	58		II.	Sh.	In.
31	2	42		II.	Tr.	In.
	2	50	49	IV.	Ec.	Re.
	2	51		II.	Sh.	Eg.
	5	33		II.	Tr.	Eg.
	6	25		I.	Sh.	In.
	7	46		I.	Tr.	In.
	8	44		I.	Sh.	Eg.
	10	4		I.	Tr.	Eg.
	11	50		IV.	Oc.	Dis.
	15	7		IV.*	Oc.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

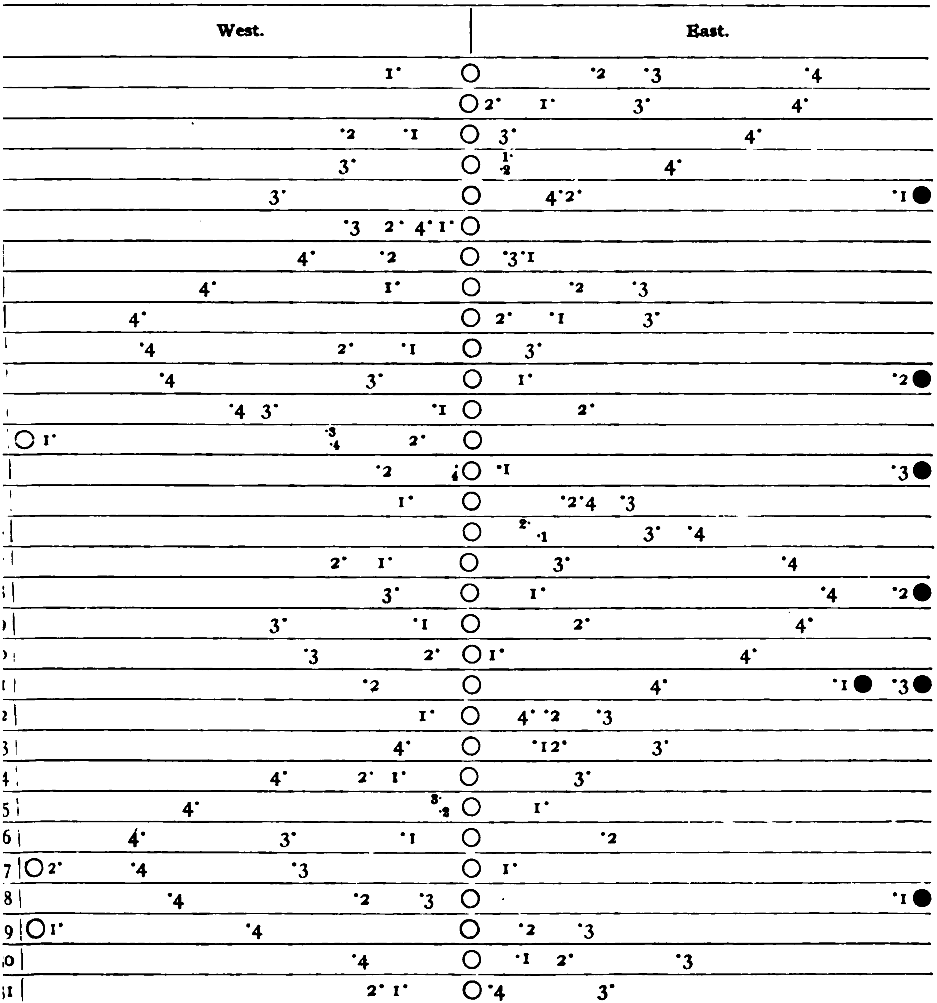
WASHINGTON MEAN TIME.

MAY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 15ʰ 30ᵐ for an Inverting Telescope.



WASHINGTON MEAN TIME.

JUNE.

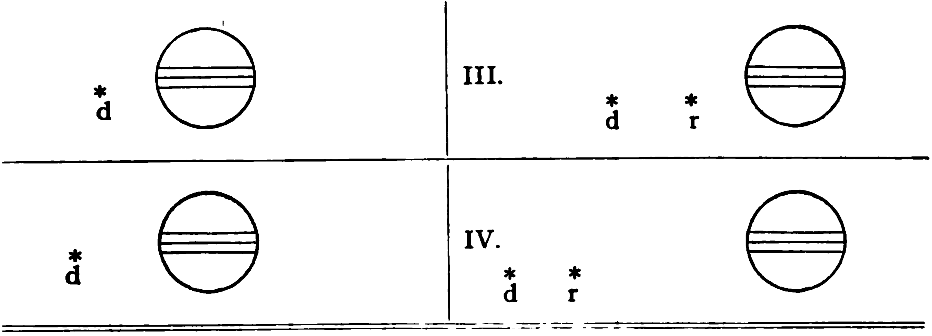
d	h	m	s			
1	3	36	52	I.	Ec.	Dis.
	6	55		III.	Sh.	In.
	7	13		I.	Oc.	Re.
	10	16		III.	Sh.	Eg.
	12	28		III.	Tr.	In.
	15	35		III.*	Tr.	Eg.
	19	2	40	II.	Ec.	Dis.
2	0	32		II.	Oc.	Re.
	0	54		I.	Sh.	In.
	2	15		I.	Tr.	In.
	3	12		I.	Sh.	Eg.
	4	32		I.	Tr.	Eg.
	22	5	22	I.	Ec.	Dis.
3	1	42		I.	Oc.	Re.
	13	16		II.	Sh.	In.
	16	2		II.*	Tr.	In.
	16	9		II.	Sh.	Eg.
	18	53		II.	Tr.	Eg.
	19	22		I.	Sh.	In.
	20	44		I.	Tr.	In.
	21	41		I.	Sh.	Eg.
	23	1		I.	Tr.	Eg.
4	16	33	56	I.	Ec.	Dis.
	20	11		I.	Oc.	Re.
	21	1	21	III.	Ec.	Dis.
5	0	11	27	III.	Ec.	Re.
	2	34		III.	Oc.	Dis.
	5	39		III.	Oc.	Re.
	8	20	3	II.	Ec.	Dis.
	13	50		I.*	Sh.	In.
	13	51		II.*	Oc.	Re.
	15	13		I.*	Tr.	In.
	16	9		I.	Sh.	Eg.
	17	30		I.	Tr.	Eg.
6	11	2	24	I.	Ec.	Dis.
	14	40		I.*	Oc.	Re.
7	2	34		II.	Sh.	In.
	5	23		II.	Tr.	In.
	5	28		II.	Sh.	Eg.
	8	14		II.	Tr.	Eg.
	8	19		I.	Sh.	In.
	9	42		I.	Tr.	In.
	10	38		I.	Sh.	Eg.
	11	59		I.	Tr.	Eg.
8	5	30	59	I.	Ec.	Dis.
	9	9		I.	Oc.	Re.
	9	24		IV.	Sh.	In.
	10	55		III.	Sh.	In.
	13	24		IV.*	Sh.	Eg.
	14	15		III.*	Sh.	Eg.
	16	37		III.	Tr.	In.
	19	41		III.	Tr.	Eg.
	21	37	25	II.	Ec.	Dis.
	23	0		IV.	Tr.	In.
9	2	4		IV.	Tr.	Eg.
	2	47		I.	Sh.	In.
	3	10		II.	Oc.	Re.
	4	10		I.	Tr.	In.
	5	6		I.	Sh.	Eg.
	6	28		I.	Tr.	Eg.
	23	59	29	I.	Ec.	Dis.
10	3	38		I.	Oc.	Re.
	15	52		II.*	Sh.	In.
	18	42		II.	Tr.	In.
	18	46		II.	Sh.	Eg.
	21	16		I.	Sh.	In.
10	21	33		II.	Tr.	Eg.
	22	39		I.	Tr.	In.
	23	34		I.	Sh.	Eg.
11	0	56		I.	Tr.	Eg.
	18	28	4	I.	Ec.	Dis.
	22	7		I.	Oc.	Re.
12	1	2	45	III.	Ec.	Dis.
	4	11	52	III.	Ec.	Re.
	6	42		III.	Oc.	Dis.
	9	44		III.	Oc.	Re.
	10	54	46	II.	Ec.	Dis.
	15	44		I.*	Sh.	In.
	16	28		II.	Oc.	Re.
	17	8		I.	Tr.	In.
	18	3		I.	Sh.	Eg.
	19	25		I.	Tr.	Eg.
13	12	56	32	I.	Ec.	Dis.
	16	35		I.	Oc.	Re.
14	5	12		II.	Sh.	In.
	8	2		II.	Tr.	In.
	8	5		II.	Sh.	Eg.
	10	13		I.	Sh.	In.
	10	53		II.	Tr.	Eg.
	11	36		I.	Tr.	In.
	12	31		I.	Sh.	Eg.
	13	54		I.*	Tr.	Eg.
15	7	25	7	I.	Ec.	Dis.
	11	4		I.	Oc.	Re.
	14	56		III.*	Sh.	In.
	18	14		III.	Sh.	Eg.
	20	42		III.	Tr.	In.
	23	43		III.	Tr.	Eg.
16	0	12	4	II.	Ec.	Dis.
	4	41		I.	Sh.	In.
	5	46		II.	Oc.	Re.
	6	5		I.	Tr.	In.
	7	0		I.	Sh.	Eg.
	8	22		I.	Tr.	Eg.
	17	17	33	IV.	Ec.	Dis.
	20	57	17	IV.	Ec.	Re.
17	1	53	37	I.	Ec.	Dis.
	5	32		I.	Oc.	Re.
	6	42		IV.	Oc.	Dis.
	9	35		IV.	Oc.	Re.
	18	30		II.	Sh.	In.
	21	21		II.	Tr.	In.
	21	23		II.	Sh.	Eg.
	23	10		I.	Sh.	In.
18	0	11		II.	Tr.	Eg.
	0	33		I.	Tr.	In.
	1	28		I.	Sh.	Eg.
	2	50		I.	Tr.	Eg.
	20	22	12	I.	Ec.	Dis.
19	0	1		I.	Oc.	Re.
	5	3	36	III.	Ec.	Dis.
	8	11	42	III.	Ec.	Re.
	10	45		III.	Oc.	Dis.
	13	29	21	II.*	Ec.	Dis.
	13	45		III.*	Oc.	Re.
	17	38		I.	Sh.	In.
	19	2		I.	Tr.	In.
	19	3		II.	Oc.	Re.
	19	56		I.	Sh.	Eg.
	21	19		I.	Tr.	Eg.
20	14	50	41	I.*	Ec.	Dis.
	18	29		I.	Oc.	Re.
21	7	49		II.	Sh.	In.
	10	40		II.	Tr.	In.
	10	42		II.	Sh.	Eg.
	12	6		I.	Sh.	In.
	13	30		II.*	Tr.	Eg.
	13	30		I.*	Tr.	In.
	14	25		I.*	Sh.	Eg.
	15	47		I.*	Tr.	Eg.
22	9	19	17	I.	Ec.	Dis.
	12	58		I.*	Oc.	Re.
	18	56		III.	Sh.	In.
	22	14		III.	Sh.	Eg.
23	0	43		III.	Tr.	In.
	2	46	36	II.	Ec.	Dis.
	3	42		III.	Tr.	Eg.
	6	35		I.	Sh.	In.
	7	58		I.	Tr.	In.
	8	19		II.	Oc.	Re.
	8	53		I.	Sh.	Eg.
	10	16		I.	Tr.	Eg.
24	3	47	47	I.	Ec.	Dis.
	7	26		I.	Oc.	Re.
	21	7		II.	Sh.	In.
	23	58		II.	Tr.	In.
25	0	0		II.	Sh.	Eg.
	1	3		I.	Sh.	In.
	2	27		I.	Tr.	In.
	2	48		II.	Tr.	Eg.
	3	22		I.	Sh.	Eg.
	3	41		IV.	Sh.	In.
	4	44		I.	Tr.	Eg.
	7	33		IV.	Sh.	Eg.
	17	31		IV.	Tr.	In.
	20	8		IV.	Tr.	Eg.
	22	16	23	I.	Ec.	Dis.
26	1	55		I.	Oc.	Re.
	9	4	32	III.	Ec.	Dis.
	12	11	35	III.*	Ec.	Re.
	14	45		III.*	Oc.	Dis.
	16	3	52	II.*	Ec.	Dis.
	17	42		III.	Oc.	Re.
	19	32		I.	Sh.	In.
	20	55		I.	Tr.	In.
	21	36		II.	Oc.	Re.
	21	50		I.	Sh.	Eg.
	23	12		I.	Tr.	Eg.
27	16	44	51	I.	Ec.	Dis.
	20	23		I.	Oc.	Re.
28	10	26		II.	Sh.	In.
	13	16		II.*	Tr.	In.
	13	19		II.*	Sh.	Eg.
	14	0		I.*	Sh.	In.
	15	23		I.*	Tr.	In.
	16	6		II.*	Tr.	Eg.
	16	18		I.	Sh.	Eg.
	17	40		I.	Tr.	Eg.
29	11	13	28	I.	Ec.	Dis.
	14	51		I.*	Oc.	Re.
	22	57		III.	Sh.	In.
30	2	14		III.	Sh.	Eg.
	4	40		III.	Tr.	In.
	5	21	4	II.	Ec.	Dis.
	7	36		III.	Tr.	Eg.
	8	28		I.	Sh.	In.
	9	51		I.	Tr.	In.
	10	47		I.	Sh.	Eg.
	10	51		II.	Oc.	Re.
	12	8		I.*	Tr.	Eg.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

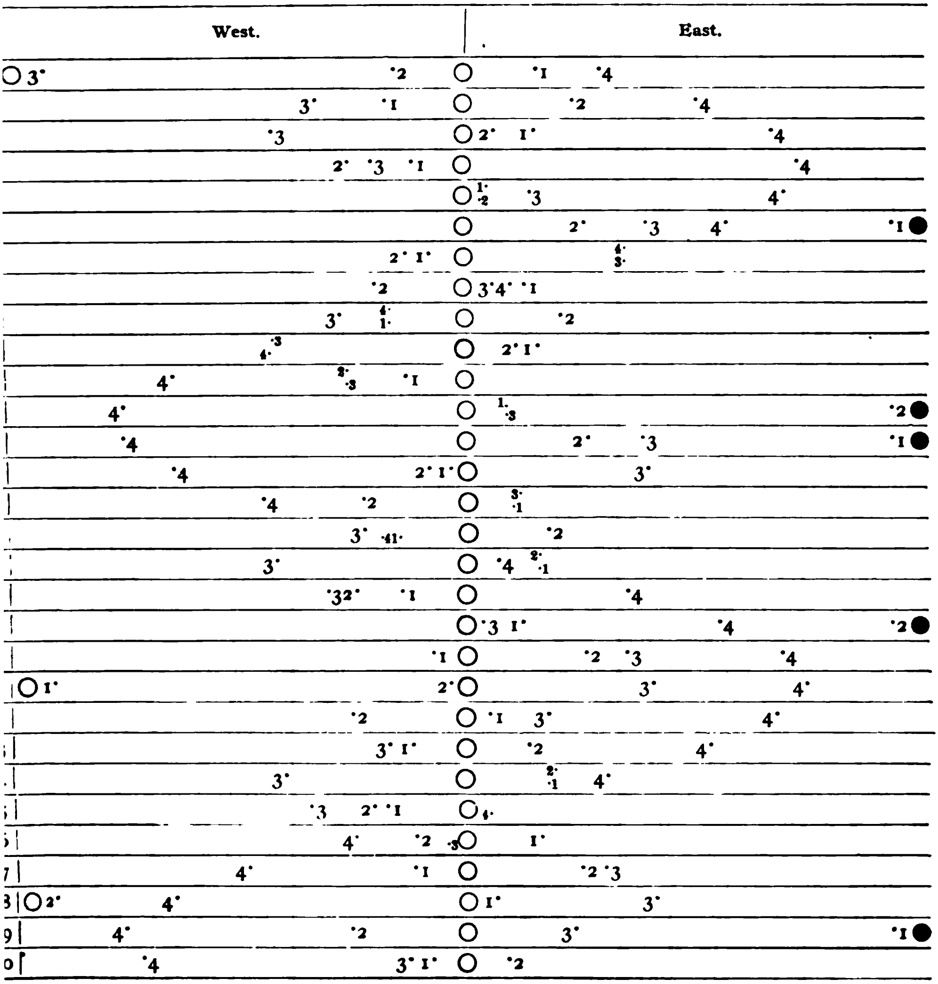
WASHINGTON MEAN TIME.

JUNE.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 14h 15m for an Inverting Telescope.



WASHINGTON MEAN TIME.

JULY.

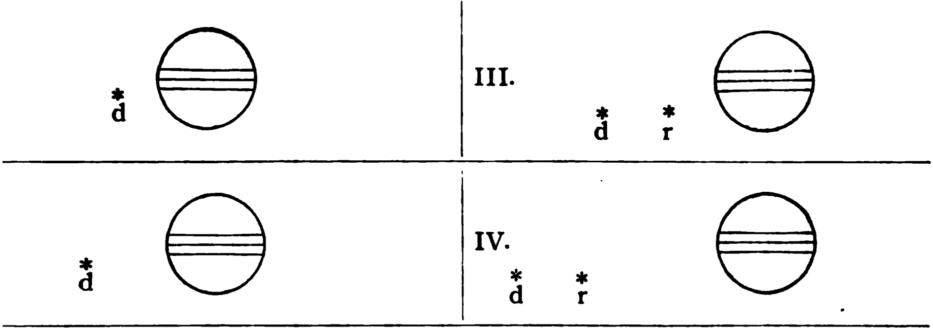
d	h	m	s			
1	5	41	59	I.	Ec.	Dis.
	9	19		I.	Oc.	Re.
	23	44		II.	Sh.	In.
2	2	32		II.	Tr.	In.
	2	37		II.	Sh.	Eg.
	2	57		I.	Sh.	In.
	4	19		I.	Tr.	In.
	5	15		I.	Sh.	Eg.
	5	22		II.	Tr.	Eg.
	6	36		I.	Tr.	Eg.
3	0	10	35	I.	Ec.	Dis.
	3	47		I.	Oc.	Re.
	11	32	12	IV.	Ec.	Dis.
	13	5	6	III.*	Ec.	Dis.
	15	3	53	IV.*	Ec.	Re.
	16	11	6	III.	Ec.	Re.
	18	38	18	II.	Ec.	Dis.
	18	39		III.	Oc.	Dis.
	21	25		I.	Sh.	In.
	21	34		III.	Oc.	Re.
	22	47		I.	Tr.	In.
	23	43		I.	Sh.	Eg.
4	0	6		II.	Oc.	Re.
	0	46		IV.	Oc.	Dis.
	1	4		I.	Tr.	Eg.
	3	12		IV.	Oc.	Re.
	18	39	4	I.	Ec.	Dis.
	22	15		I.	Oc.	Re.
5	13	3		II.*	Sh.	In.
	15	50		II.*	Tr.	In.
	15	54		I.*	Sh.	In.
	15	56		II.*	Sh.	Eg.
	17	15		I.	Tr.	In.
	18	12		I.	Sh.	Eg.
	18	39		II.	Tr.	Eg.
	19	32		I.	Tr.	Eg.
6	13	7	41	I.*	Ec.	Dis.
	16	43		I.	Oc.	Re.
7	2	58		III.	Sh.	In.
	6	14		III.	Sh.	Eg.
	7	55	30	II.	Ec.	Dis.
	8	33		III.	Tr.	In.
	10	22		I.	Sh.	In.
	11	27		III.	Tr.	Eg.
	11	43		I.*	Tr.	In.
	12	40		I.*	Sh.	Eg.
	13	21		II.*	Oc.	Re.
	13	59		I.*	Tr.	Eg.
8	7	36	13	I.	Ec.	Dis.
	11	11		I.	Oc.	Re.
9	2	21		II.	Sh.	In.
	4	50		I.	Sh.	In.
	5	5		II.	Tr.	In.
	5	14		II.	Sh.	Eg.
	6	10		I.	Tr.	In.
	7	9		I.	Sh.	Eg.
	7	54		II.	Tr.	Eg.
	8	27		I.	Tr.	Eg.
10	2	4	49	I.	Ec.	Dis.
	5	39		I.	Oc.	Re.
	17	5	44	III.	Ec.	Dis.
	20	10	38	III.	Ec.	Re.
	21	12	43	II.	Ec.	Dis.
	22	29		III.	Oc.	Dis.
	23	19		I.	Sh.	In.
11	0	38		I.	Tr.	In.
11	1	22		III.	Oc.	Re.
	1	37		I.	Sh.	Eg.
	2	35		II.	Oc.	Re.
	2	54		I.	Tr.	Eg.
	20	33	19	I.	Ec.	Dis.
	21	58		IV.	Sh.	In.
12	0	6		I.	Oc.	Re.
	1	41		IV.	Sh.	Eg.
	11	8		IV.	Tr.	In.
	13	15		IV.*	Tr.	Eg.
	15	40		II.*	Sh.	In.
	17	47		I.	Sh.	In.
	18	21		II.	Tr.	In.
	18	33		II.	Sh.	Eg.
	19	6		I.	Tr.	In.
	20	5		I.	Sh.	Eg.
	21	10		II.	Tr.	Eg.
	21	22		I.	Tr.	Eg.
13	15	1	57	I.*	Ec.	Dis.
	18	34		I.	Oc.	Re.
14	6	59		III.	Sh.	In.
	10	13		III.	Sh.	Eg.
	10	29	54	II.	Ec.	Dis.
	12	16		I.*	Sh.	In.
	12	20		III.*	Tr.	In.
	13	33		I.*	Tr.	In.
	14	34		I.*	Sh.	Eg.
	15	12		III.*	Tr.	Eg.
	15	48		II.*	Oc.	Re.
	15	50		I.*	Tr.	Eg.
15	9	30	29	I.*	Ec.	Dis.
	13	2		I.*	Oc.	Re.
16	4	58		II.	Sh.	In.
	6	44		I.	Sh.	In.
	7	35		II.	Tr.	In.
	7	51		II.	Sh.	Eg.
	8	0		I.	Tr.	In.
	9	2		I.	Sh.	Eg.
	10	17		I.	Tr.	Eg.
	10	24		II.	Tr.	Eg.
17	3	59	7	I.	Ec.	Dis.
	7	29		I.	Oc.	Re.
	21	6	49	III.	Ec.	Dis.
	23	47	7	II.	Ec.	Dis.
18	0	10	37	III.	Ec.	Re.
	1	12		I.	Sh.	In.
	2	15		III.	Oc.	Dis.
	2	28		I.	Tr.	In.
	3	30		I.	Sh.	Eg.
	4	44		I.	Tr.	Eg.
	5	1		II.	Oc.	Re.
	5	6		III.	Oc.	Re.
	22	27	37	I.	Ec.	Dis.
19	1	57		I.	Oc.	Re.
	18	18		II.	Sh.	In.
	19	41		I.	Sh.	In.
	20	50		II.	Tr.	In.
	20	55		I.	Tr.	In.
	21	10		II.	Sh.	Eg.
	21	59		I.	Sh.	Eg.
	23	12		I.	Tr.	Eg.
	23	38		II.	Tr.	Eg.
20	5	47	23	IV.	Ec.	Dis.
	9	10	29	IV.	Ec.	Re.
	16	56	16	I.	Ec.	Dis.
	17	52		IV.	Oc.	Dis.
20	19	51		IV.	Oc.	Re.
	20	24		I.	Oc.	Re.
21	11	0		III.*	Sh.	In.
	13	4	19	II.*	Ec.	Dis.
	14	9		I.*	Sh.	In.
	14	13		III.*	Sh.	Eg.
	15	22		I.*	Tr.	In.
	16	3		III.*	Tr.	In.
	16	27		I.	Sh.	Eg.
	17	39		I.	Tr.	Eg.
	18	14		II.	Oc.	Re.
	18	54		III.	Tr.	Eg.
22	11	24	49	I.*	Ec.	Dis.
	14	52		I.*	Oc.	Re.
23	7	36		II.	Sh.	In.
	8	38		I.	Sh.	In.
	9	49		I.	Tr.	In.
	10	3		II.	Tr.	In.
	10	28		II.*	Sh.	Eg.
	10	56		I.*	Sh.	Eg.
	12	6		I.*	Tr.	Eg.
	12	51		II.*	Tr.	Eg.
24	5	53	28	I.	Ec.	Dis.
	9	19		I.	Oc.	Re.
25	1	7	56	III.	Ec.	Dis.
	2	21	32	II.	Ec.	Dis.
	3	6		I.	Sh.	In.
	4	10	36	III.	Ec.	Re.
	4	16		I.	Tr.	In.
	5	24		I.	Sh.	Eg.
	5	56		III.	Oc.	Dis.
	6	33		I.	Tr.	Eg.
	7	25		II.	Oc.	Re.
	8	45		III.	Oc.	Re.
26	0	21	59	I.	Ec.	Dis.
	3	46		I.	Oc.	Re.
	20	55		II.	Sh.	In.
	21	35		I.	Sh.	In.
	22	44		I.	Tr.	In.
	23	16		II.	Tr.	In.
	23	48		II.	Sh.	Eg.
	23	52		I.	Sh.	Eg.
27	1	0		I.	Tr.	Eg.
	2	5		II.	Tr.	Eg.
	18	50	39	I.	Ec.	Dis.
	22	13		I.	Oc.	Re.
28	15	0		III.*	Sh.	In.
	15	38	46	II.*	Ec.	Dis.
	16	3		I.*	Sh.	In.
	16	14		IV.*	Sh.	In.
	17	10		I.	Tr.	In.
	18	12		III.	Sh.	Eg.
	18	21		I.	Sh.	Eg.
	19	27		I.	Tr.	Eg.
	19	41		III.	Tr.	In.
	19	50		IV.	Sh.	Eg.
	20	37		II.	Oc.	Re.
	22	30		III.	Tr.	Eg.
29	3	43		IV.	Tr.	In.
	5	24		IV.	Tr.	Eg.
	13	19	13	I.*	Ec.	Dis.
	16	40		I.	Oc.	Re.
30	10	14		II.*	Sh.	In.
	10	32		I.*	Sh.	In.
	11	37		I.*	Tr.	In.
	12	28		II.*	Tr.	In.
	12	49		I.*	Sh.	Eg.
	13	6		II.*	Sh.	Eg.
	13	54		I.*	Tr.	Eg.
	15	16		II.*	Tr.	Eg.
31	7	47	53	I.	Ec.	Dis.
	11	7		I.*	Oc.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

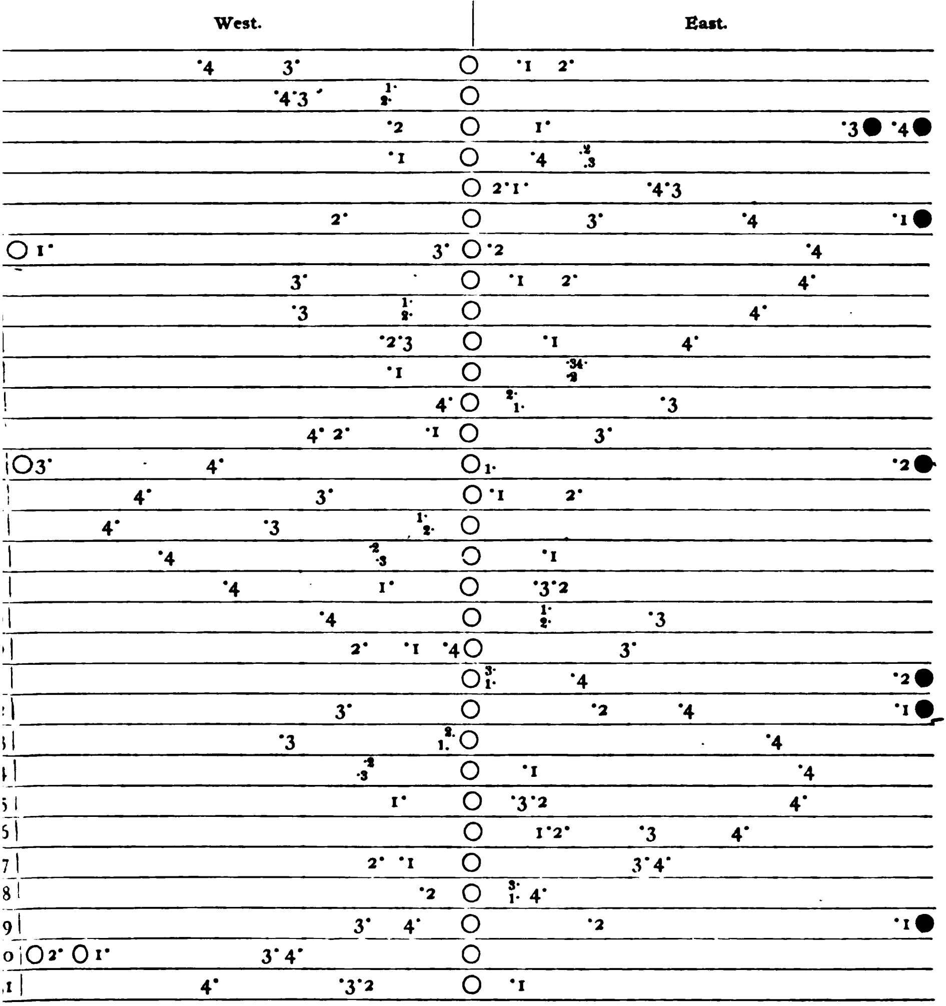
WASHINGTON MEAN TIME.

JULY.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 13h 30m for an Inverting Telescope.



WASHINGTON MEAN TIME.

AUGUST.

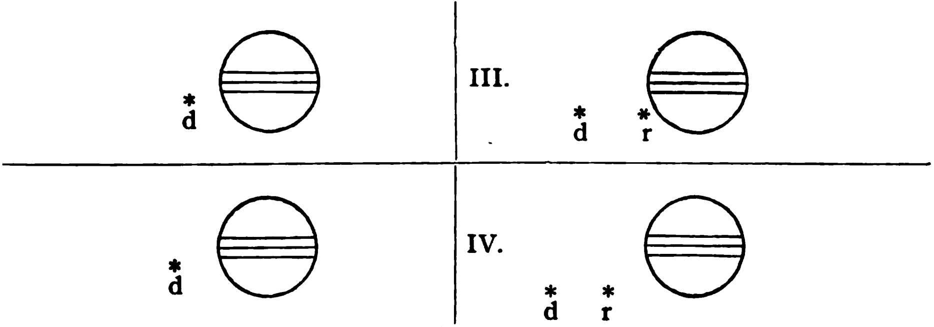
d	h	m	s			
1	4	56	0	II.	Ec.	Dis.
	5	0		I.	Sh.	In.
	5	9	43	III.	Ec.	Dis.
	6	4		I.	Tr.	In.
	7	18		I.	Sh.	Eg.
	8	11	16	III.	Ec.	Re.
	8	20		I.	Tr.	Eg.
	9	32		III.	Oc.	Dis.
	9	47		II.	Oc.	Re.
	12	20		III.*	Oc.	Re.
2	2	16	26	I.	Ec.	Dis.
	5	34		I.	Oc.	Re.
	23	28		I.	Sh.	In.
	23	33		II.	Sh.	In.
3	0	31		I.	Tr.	In.
	1	40		II.	Tr.	In.
	1	46		I.	Sh.	Eg.
	2	25		II.	Sh.	Eg.
	2	47		I.	Tr.	Eg.
	4	28		II.	Tr.	Eg.
	20	45	6	I.	Ec.	Dis.
4	0	1		I.	Oc.	Re.
	17	57		I.	Sh.	In.
	18	13	16	II.	Ec.	Dis.
	18	57		I.	Tr.	In.
	19	0		III.	Sh.	In.
	20	15		I.	Sh.	Eg.
	21	14		I.	Tr.	Eg.
	22	12		III.	Sh.	Eg.
	22	58		II.	Oc.	Re.
	23	14		III.	Tr.	In.
5	2	1		III.	Tr.	Eg.
	15	13	41	I.*	Ec.	Dis.
	18	28		I.	Oc.	Re.
6	0	3	9	IV.	Ec.	Dis.
	3	16	44	IV.	Ec.	Re.
	9	55		IV.*	Oc.	Dis.
	11	34		IV.*	Oc.	Re.
	12	25		I.*	Sh.	In.
	12	51		II.*	Sh.	In.
	13	24		I.*	Tr.	In.
	14	43		I.*	Sh.	Eg.
	14	51		II.*	Tr.	In.
	15	40		I.*	Tr.	Eg.
	15	43		II.*	Sh.	Eg.
	17	39		II.	Tr.	Eg.
7	9	42	23	I.*	Ec.	Dis.
	12	54		I.*	Oc.	Re.
8	6	54		I.	Sh.	In.
	7	30	32	II.	Ec.	Dis.
	7	50		I.	Tr.	In.
	9	11	0	III.	Ec.	Dis.
	9	12		I.	Sh.	Eg.
	10	7		I.*	Tr.	Eg.
	12	7		II.*	Oc.	Re.
	12	11	24	III.*	Ec.	Re.
	13	3		III.*	Oc.	Dis.
	15	50		III.*	Oc.	Re.
9	4	10	56	I.	Ec.	Dis.
	7	21		I.	Oc.	Re.
10	1	22		I.	Sh.	In.
	2	10		II.	Sh.	In.
	2	17		I.	Tr.	In.
	3	40		I.	Sh.	Eg.
	4	2		II.	Tr.	In.
	4	33		I.	Tr.	Eg.
10	5	2		II.	Sh.	Eg.
	6	50		II.	Tr.	Eg.
	22	39	38	I.	Ec.	Dis.
11	1	47		I.	Oc.	Re.
	19	51		I.	Sh.	In.
	20	44		I.	Tr.	In.
	20	47	51	II.	Ec.	Dis.
	22	9		I.	Sh.	Eg.
	23	0		I.	Tr.	Eg.
	23	1		III.	Sh.	In.
12	1	16		II.	Oc.	Re.
	2	12		III.	Sh.	Eg.
	2	42		III.	Tr.	In.
	5	29		III.	Tr.	Eg.
	17	8	14	I.	Ec.	Dis.
	20	14		I.	Oc.	Re.
13	14	19		I.*	Sh.	In.
	15	10		I.*	Tr.	In.
	15	29		II.*	Sh.	In.
	16	37		I.*	Sh.	Eg.
	17	12		II.	Tr.	In.
	17	26		I.	Tr.	Eg.
	18	21		II.	Sh.	Eg.
	20	0		II.	Tr.	Eg.
14	10	32		IV.*	Sh.	In.
	11	36	57	I.*	Ec.	Dis.
	13	59		IV.*	Sh.	Eg.
	14	40		I.*	Oc.	Re.
	19	14		IV.	Tr.	In.
	20	41		IV.	Tr.	Eg.
15	8	48		I.	Sh.	In.
	9	36		I.*	Tr.	In.
	10	5	11	II.*	Ec.	Dis.
	11	6		I.*	Sh.	Eg.
	11	52		I.*	Tr.	Eg.
	13	12	24	III.*	Ec.	Dis.
	14	25		II.*	Oc.	Re.
	16	11	37	III.*	Ec.	Re.
	16	30		III.*	Oc.	Dis.
	19	16		III.	Oc.	Re.
16	6	5	32	I.	Ec.	Dis.
	9	7		I.*	Oc.	Re.
17	3	16		I.	Sh.	In.
	4	2		I.	Tr.	In.
	4	48		II.	Sh.	In.
	5	34		I.	Sh.	Eg.
	6	18		I.	Tr.	Eg.
	6	23		II.	Tr.	In.
	7	40		II.	Sh.	Eg.
	9	10		II.*	Tr.	Eg.
18	0	34	15	I.	Ec.	Dis.
	3	33		I.	Oc.	Re.
	21	45		I.	Sh.	In.
	22	29		I.	Tr.	In.
	23	22	34	II.	Ec.	Dis.
19	0	2		I.	Sh.	Eg.
	0	45		I.	Tr.	Eg.
	3	2		III.	Sh.	In.
	3	34		II.	Oc.	Re.
	6	6		III.	Tr.	In.
	6	12		III.	Sh.	Eg.
	8	53		III.*	Tr.	Eg.
	19	2	53	I.	Ec.	Dis.
	22	0		I.	Oc.	Re.
20	16	13		I.*	Sh.	In.
	16	55		I.	Tr.	In.
20	18	7		II.	Sh.	In.
	18	31		I.	Sh.	Eg.
	19	11		I.	Tr.	Eg.
	19	31		II.	Tr.	In.
	20	58		II.	Sh.	Eg.
	22	19		II.	Tr.	Eg.
21	13	31	37	I.*	Ec.	Dis.
	16	26		I.*	Oc.	Re.
22	10	42		I.*	Sh.	In.
	11	21		I.*	Tr.	In.
	12	39	57	II.*	Ec.	Dis.
	13	0		I.*	Sh.	Eg.
	13	37		I.*	Tr.	Eg.
	16	42		II.*	Oc.	Re.
	17	13	32	III.	Ec.	Dis.
	18	20	10	IV.	Ec.	Dis.
	21	23	36	IV.	Ec.	Re.
	22	39		III.	Oc.	Re.
23	0	58		IV.	Oc.	Dis.
	2	30		IV.	Oc.	Re.
	8	0	14	I.	Ec.	Dis.
	10	52		I.*	Oc.	Re.
24	5	10		I.	Sh.	In.
	5	47		I.	Tr.	In.
	7	26		II.	Sh.	In.
	7	28		I.	Sh.	Eg.
	8	3		I.	Tr.	Eg.
	8	41		II.*	Tr.	In.
	10	18		II.*	Sh.	Eg.
	11	28		II.*	Tr.	Eg.
25	2	28	58	I.	Ec.	Dis.
	5	18		I.	Oc.	Re.
	23	39		I.	Sh.	In.
26	0	13		I.	Tr.	In.
	1	56		I.	Sh.	Eg.
	1	57	24	II.	Ec.	Dis.
	2	29		I.	Tr.	Eg.
	5	49		II.	Oc.	Re.
	7	4		III.	Sh	In.
	9	28		III.*	Tr.	In.
	10	12		III.*	Sh.	Eg.
	12	14		III.*	Tr.	Eg.
	20	57	38	I.	Ec	Dis.
	23	44		I.	Oc.	Re.
27	18	7		I.	Sh.	In.
	18	39		I.	Tr.	In.
	20	25		I.	Sh.	Eg.
	20	44		II.	Sh.	In.
	20	55		I.	Tr.	Eg.
	21	49		II.	Tr.	In.
	23	36		II.	Sh.	Eg.
28	0	36		II.	Tr.	Eg.
	15	26	24	I.*	Ec.	Dis.
	18	10		I.	Oc.	Re.
29	12	36		I.*	Sh.	In.
	13	5		I.*	Tr.	In.
	14	53		I.*	Sh.	Eg.
	15	14	52	II.*	Ec.	Dis.
	15	21		I.*	Tr.	Eg.
	18	56		II.	Oc.	Re.
	21	14	48	III.	Ec.	Dis
30	1	58		III.	Oc.	Re.
	9	55	2	I.*	Ec.	Dis.
	12	37		I.*	Oc.	Re
31	4	51		IV.	Sh.	In.
	7	4		I.	Sh.	In.
	7	31		I.	Tr.	In.
	8	7		IV.*	Sh.	Eg.
	9	22		I.*	Sh.	Eg.
	9	47		I.*	Tr.	Eg.
	9	47		IV.*	Tr.	In.
	10	4		II.*	Sh.	In.
	10	58		II.*	Tr.	In.
	11	17		IV.*	Tr.	Eg.
	12	55		II.*	Sh.	Eg.
	13	45		II.*	Tr.	Eg.

Note.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse. Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

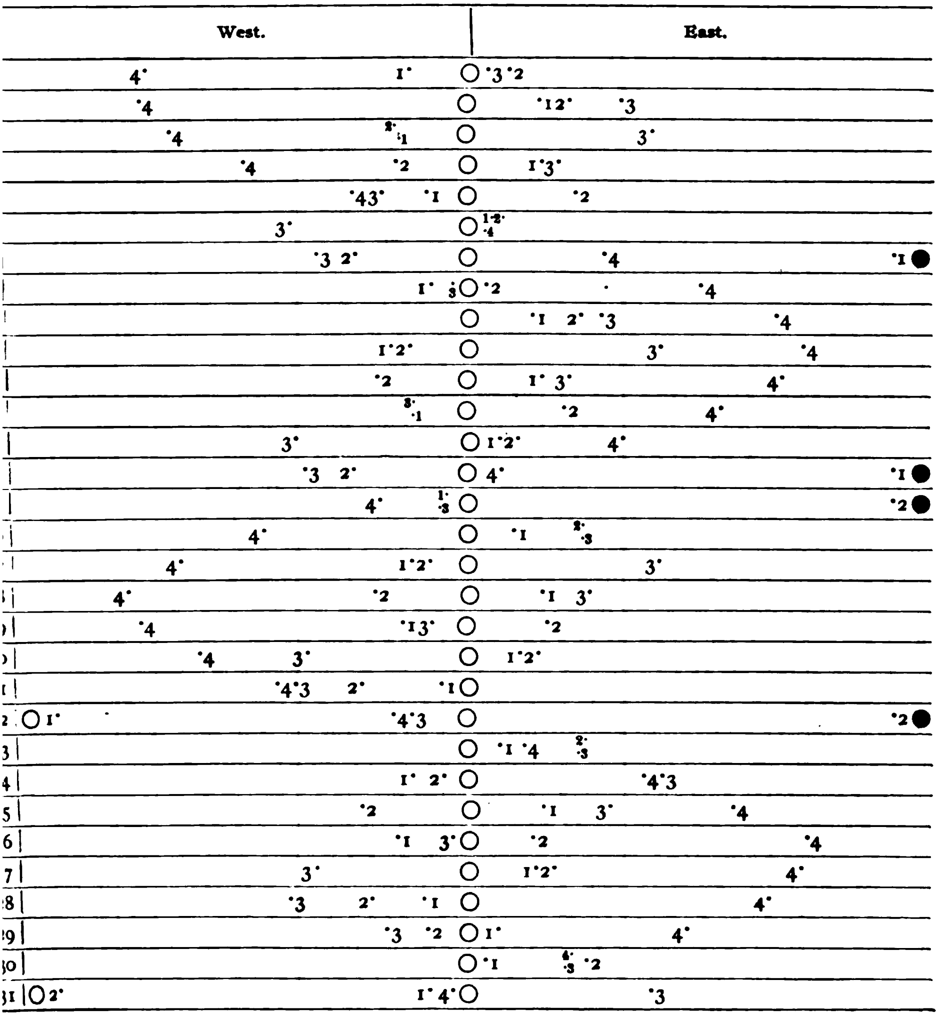
WASHINGTON MEAN TIME.

AUGUST.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 12^h 45^m for an Inverting Telescope.



WASHINGTON MEAN TIME.

SEPTEMBER.

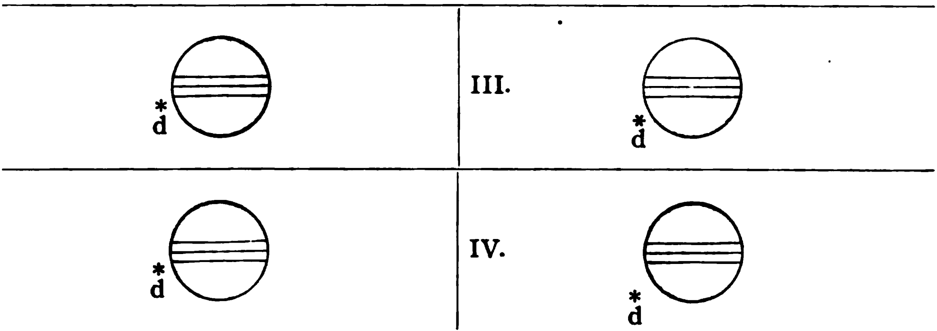
d	h	m	s			
1	4	23	48	I.	Ec.	Dis.
	7	3		I.	Oc.	Re.
2	1	33		I.	Sh.	In.
	1	57		I.	Tr.	In.
	3	50		I.	Sh.	Eg.
	4	13		I.	Tr.	Eg.
	4	32	25	II.	Ec.	Dis.
	8	4		II.*	Oc.	Re.
	11	6		III.*	Sh.	In.
	12	45		III.*	Tr.	In.
	14	13		III.*	Sh.	Eg.
	15	33		III.*	Tr.	Eg.
	22	52	29	I.	Ec.	Dis.
3	1	29		I.	Oc.	Re.
	20	2		I.	Sh.	In.
	20	22		I.	Tr.	In.
	22	19		I.	Sh.	Eg.
	22	38		I.	Tr.	Eg.
	23	22		II.	Sh.	In.
4	0	5		II.	Tr.	In.
	2	14		II.	Sh.	Eg.
	2	52		II.	Tr.	Eg.
	17	21	16	I.	Ec.	Dis.
	19	55		I.	Oc.	Re.
5	14	30		I.*	Sh.	In.
	14	48		I.*	Tr.	In.
	16	48		I.*	Sh.	Eg.
	17	4		I.	Tr.	Eg.
	17	49	59	II.	Ec.	Dis.
	21	11		II.	Oc.	Re.
6	1	16	37	III.	Ec.	Dis.
	5	16		III.	Oc.	Re.
	11	49	56	I.*	Ec.	Dis.
	14	21		I.*	Oc.	Re.
7	8	59		I.*	Sh.	In.
	9	14		I.*	Tr.	In.
	11	16		I.*	Sh.	Eg.
	11	30		I.*	Tr.	Eg.
	12	42		II.*	Sh.	In.
	13	13		II.*	Tr.	In.
	15	33		II.*	Sh.	Eg.
	16	1		II.*	Tr.	Eg.
8	6	18	44	I.	Ec.	Dis.
	8	47		I.*	Oc.	Re.
	12	38	19	IV.*	Ec.	Dis.
	16	57		IV.*	Oc.	Re.
9	3	27		I.	Sh.	In.
	3	40		I.	Tr.	In.
	5	45		I.	Sh.	Eg.
	5	56		I.	Tr.	Eg.
	7	7	36	II.	Ec.	Dis.
	10	17		II.*	Oc.	Re.
	15	7		III.*	Sh.	In.
	16	1		III.*	Tr.	In.
	18	13		III.	Sh.	Eg.
	18	49		III.	Tr.	Eg.
10	0	47	26	I.	Ec.	Dis.
	3	13		I.	Oc.	Re.
	21	56		I.	Sh.	In.
	22	6		I.	Tr.	In.
11	0	13		I.	Sh.	Eg.
	0	22		I.	Tr.	Eg.
11	2	0		II.	Sh.	In.
	2	20		II.	Tr.	In.
	4	52		II.	Sh.	Eg.
	5	8		II.	Tr.	Eg.
	19	16	15	I.	Ec.	Dis.
	21	39		I.	Oc.	Re.
12	16	25		I.*	Sh.	In.
	16	32		I.*	Tr.	In.
	18	42		I.	Sh.	Eg.
	18	48		I.	Tr.	Eg.
	20	25	16	II.	Ec.	Dis.
	23	24		II.	Oc.	Re.
13	5	18	29	III.	Ec.	Dis.
	8	33		III.*	Oc.	Re.
	13	44	57	I.*	Ec.	Dis.
	16	5		I.*	Oc.	Re.
14	10	53		I.*	Sh.	In.
	10	57		I.*	Tr.	In.
	13	11		I.*	Sh.	Eg.
	13	14		I.*	Tr.	Eg.
	15	20		II.*	Sh.	In.
	15	28		II.*	Tr.	In.
	18	11		II.	Sh.	Eg.
	18	16		II.	Tr.	Eg.
15	8	13	46	I.*	Ec.	Dis.
	10	31		I.*	Oc.	Re.
16	5	22		I.	Sh.	In.
	5	23		I.	Tr.	In.
	7	39		I.*	Sh.	Eg.
	7	39		I.*	Tr.	Eg.
	9	42		II.*	Oc.	Dis.
	12	30		II.*	Oc.	Re.
	19	8		III.	Sh.	In.
	19	15		III.	Tr.	In.
	22	5		III.	Tr.,	Eg.
	22	13		III.	Sh.	Eg.
	23	11		IV.	Sh.	In.
	23	45		IV.	Tr.	In.
17	1	35		IV.	Tr.	Eg.
	2	16		IV.	Sh.	Eg.
	2	40		I.	Oc.	Dis.
	4	56		I.	Oc.	Re.
	23	49		I.	Tr.	In.
	23	50		I.	Sh.	In.
18	2	5		I.	Tr.	Eg.
	2	8		I.	Sh.	Eg.
	4	35		II.	Tr.	In.
	4	38		II.	Sh.	In.
	7	23		II.*	Tr.	Eg.
	7	29		II.*	Sh.	Eg.
	21	6		I.	Oc.	Dis.
	23	24	21	I.	Ec.	Re.
19	18	15		I.	Tr.	In.
	18	19		I.	Sh.	In.
	20	31		I.	Tr.	Eg.
	20	36		I.	Sh.	Eg.
	22	49		II.	Oc.	Dis.
20	1	45	28	II.	Ec.	Re.
	8	58		III.*	Oc.	Dis.
	12	14	11	III.*	Ec.	Re.
	15	32		I.*	Oc.	Dis.
20	17	53	2	I.	Ec.	Re.
21	12	41		I.*	Tr.	In.
	12	48		I.*	Sh.	In.
	14	57		I.*	Tr.	Eg.
	15	5		I.*	Sh.	Eg.
	17	42		II.	Tr.	In.
	17	58		II.	Sh.	In.
	20	31		II.	Tr.	Eg.
	20	48		II.	Sh.	Eg.
22	9	58		I.*	Oc.	Dis.
	12	21	51	I.*	Ec.	Re.
23	7	6		I.*	Tr.	In.
	7	16		I.*	Sh.	In.
	9	23		I.*	Tr.	Eg.
	9	34		I.*	Sh.	Eg.
	11	55		II.*	Oc.	Dis.
	15	3	15	II.*	Ec.	Re.
	22	29		III.	Tr.	In.
	23	10		III.	Sh.	In.
24	1	21		III.	Tr.	Eg.
	2	13		III.	Sh.	Eg.
	4	24		I.	Oc.	Dis.
	6	50	35	I.*	Ec.	Re.
25	1	32		I.	Tr.	In.
	1	45		I.	Sh.	In.
	3	49		I.	Tr.	Eg.
	4	2		I.	Sh.	Eg.
	5	9		IV.	Oc.	Dis.
	6	50		II.*	Tr.	In.
	7	16		II.*	Sh.	In.
	9	37	48	IV.*	Ec.	Re.
	9	38		II.*	Tr.	Eg.
	10	7		II.*	Sh.	Eg.
	22	50		I.	Oc.	Dis.
26	1	19	25	I.	Ec.	Re.
	19	58		I.	Tr.	In.
	20	14		I.	Sh.	In.
	22	15		I.	Tr.	Eg.
	22	31		I.	Sh.	Eg.
27	1	2		II.	Oc.	Dis.
	4	21	6	II.	Ec.	Re.
	12	14		III.*	Oc.	Dis.
	16	15	0	III.*	Ec.	Re.
	17	16		I.	Oc.	Dis.
	19	48	8	I.	Ec.	Re.
28	14	24		I.*	Tr.	In.
	14	43		I.*	Sh.	In.
	16	41		I.	Tr.	Eg.
	17	0		I.	Sh.	Eg.
	19	58		II.	Tr.	In.
	20	36		II.	Sh.	In.
	22	47		II.	Tr.	Eg.
	23	26		II.	Sh.	Eg.
29	11	42		I.*	Oc.	Dis.
	14	16	58	I.*	Ec.	Re.
30	8	50		I.*	Tr.	In.
	9	11		I.*	Sh.	In.
	11	7		I.*	Tr.	Eg.
	11	28		I.*	Sh.	Eg.
	14	9		II.*	Oc.	Dis.
	17	38	58	II.	Ec.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

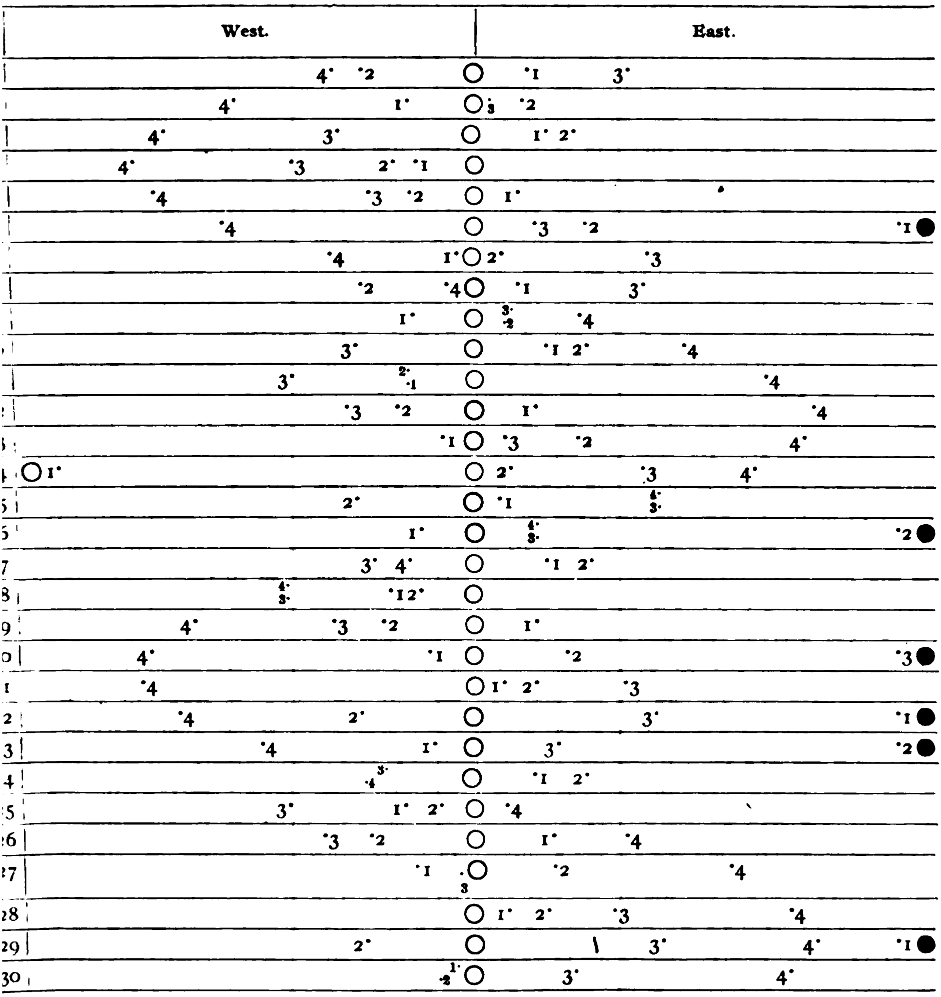
WASHINGTON MEAN TIME.

SEPTEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 12ʰ 0ᵐ for an Inverting Telescope.



WASHINGTON MEAN TIME.

OCTOBER.

d	h	m	s			
1	1	45		III.	Tr.	In.
	3	12		III.	Sh.	In.
	4	39		III.	Tr.	Eg.
	6	8		I.	Oc.	Dis.
	6	14		III.*	Sh.	Eg.
	8	45	43	I.*	Ec.	Re.
2	3	16		I.	Tr.	In.
	3	40		I.	Sh.	In.
	5	33		I.	Tr.	Eg.
	5	57		I.	Sh.	Eg.
	9	5		II.*	Tr.	In.
	9	54		II.*	Sh.	In.
	11	54		II.*	Tr.	Eg.
	12	45		II.*	Sh.	Eg.
3	0	35		I.	Oc.	Dis.
	3	14	35	I.	Ec.	Re.
	13	42		IV.*	Tr.	In.
	15	57		IV.*	Tr.	Eg.
	17	33		IV.	Sh.	In.
	20	26		IV.	Sh.	Eg.
	21	42		I.	Tr.	In.
	22	9		I.	Sh.	In.
	23	59		I.	Tr.	Eg.
4	0	26		I.	Sh.	Eg.
	3	16		II.	Oc.	Dis.
	6	56	57	II.*	Ec.	Re.
	15	31		III.*	Oc.	Dis.
	19	1		I.	Oc.	Dis.
	20	15	56	III.	Ec.	Re.
	21	43	20	I.	Ec.	Re.
5	16	8		I.	Tr.	In.
	16	38		I.	Sh.	In.
	18	25		I.	Tr.	Eg.
	18	55		I.	Sh.	Eg.
	22	14		II.	Tr.	In.
	23	14		II.	Sh.	In.
6	1	3		II.	Tr.	Eg.
	2	4		II.	Sh.	Eg.
	13	27		I.*	Oc.	Dis.
	16	12	10	I.	Ec.	Re.
7	10	35		I.*	Tr.	In.
	11	6		I.*	Sh.	In.
	12	51		I.*	Tr.	Eg.
	13	23		I.*	Sh.	Eg.
	16	24		II.	Oc.	Dis.
	20	14	56	II.	Ec.	Re.
8	5	3		III.	Tr.	In.
	7	14		III.*	Sh.	In.
	7	53		I.*	Oc.	Dis.
	7	59		III.*	Tr.	Eg.
	10	15		III.*	Sh.	Eg.
	10	40	57	I.*	Ec.	Re.
9	5	1		I.	Tr.	In.
	5	35		I.	Sh.	In.
	7	18		I.*	Tr.	Eg.
	7	52		I.*	Sh.	Eg.
	11	22		II.*	Tr.	In.
	12	32		II.*	Sh.	In.
	14	12		II.*	Tr.	Eg.
	15	22		II.*	Sh.	Eg.
10	2	20		I.	Oc.	Dis.
	5	9	50	I.	Ec.	Re.
	23	27		I.	Tr.	In.
11	0	4		I.	Sh.	In.
	1	44		I.	Tr.	Eg.
	2	21		I.	Sh.	Eg.

d	h	m	s			
11	5	32		II.	Oc.	Dis.
	9	33	4	II.*	Ec.	Re.
	18	50		III.	Oc.	Dis.
	19	20		IV.	Oc.	Dis.
	20	46		I.	Oc.	Dis.
	21	50		IV.	Oc.	Re.
	23	38	36	I.	Ec.	Re.
12	0	16	37	III.	Ec.	Re.
	1	18	28	IV.	Ec.	Dis.
	3	45	23	IV.	Ec.	Re.
	17	53		I.	Tr.	In.
	18	33		I.	Sh.	In.
	20	10		I.	Tr.	Eg.
	20	50		I.	Sh.	Eg.
13	0	31		II.	Tr.	In.
	1	52		II.	Sh.	In.
	3	21		II.	Tr.	Eg.
	4	42		II.	Sh.	Eg.
	15	12		I.*	Oc.	Dis.
	18	7	28	I.	Ec.	Re.
14	12	20		I.*	Tr.	In.
	13	1		I.*	Sh.	In.
	14	37		I.*	Tr.	Eg.
	15	18		I.	Sh.	Eg.
	18	41		II.	Oc.	Dis.
	22	51	9	II.	Ec.	Re.
15	8	24		III.*	Tr.	In.
	9	39		I.*	Oc.	Dis.
	11	17		III.*	Sh.	In.
	11	22		III.*	Tr.	Eg.
	12	36	16	I.*	Ec.	Re.
	14	16		III.*	Sh.	Eg.
16	6	46		I.*	Tr.	In.
	7	30		I.*	Sh.	In.
	9	3		I.*	Tr.	Eg.
	9	47		I.*	Sh.	Eg.
	13	41		II.*	Tr.	In.
	15	10		II.	Sh.	In.
	16	30		II.	Tr.	Eg.
	18	0		II.	Sh.	Eg.
17	4	5		I.	Oc.	Dis.
	7	5	10	I.*	Ec.	Re.
18	1	13		I.	Tr.	In.
	1	59		I.	Sh.	In.
	3	30		I.	Tr.	Eg.
	4	16		I.	Sh.	Eg.
	7	50		II.*	Oc.	Dis.
	12	9	26	II.*	Ec.	Re.
	22	12		III.	Oc.	Dis.
	22	32		I.	Oc.	Dis.
19	1	12		III.	Oc.	Re.
	1	29	31	III.	Ec.	Dis.
	1	33	58	I.	Ec.	Re.
	4	17	26	III.	Ec.	Re.
	19	39		I.	Tr.	In.
	20	28		I.	Sh.	In.
	21	56		I.	Tr.	Eg.
	22	45		I.	Sh.	Eg.
20	2	51		II.	Tr.	In.
	4	9		IV.	Tr.	In.
	4	29		II.	Sh.	In.
	5	40		II.	Tr.	Eg.
	6	49		IV.*	Tr.	Eg.
	7	19		II.*	Sh.	Eg.
	11	55		IV.*	Sh.	In.
	14	35		IV.*	Sh.	Eg.

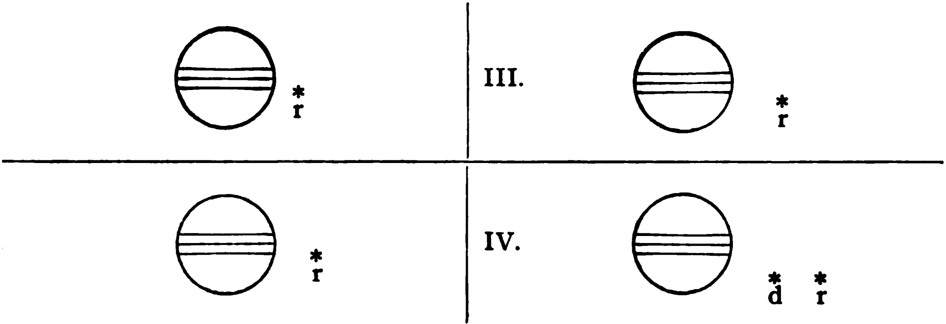
d	h	m	s			
20	16	59		I.	Oc.	Dis.
	20	2	51	I.	Ec.	Re.
21	14	6		I.*	Tr.	In.
	14	56		I.	Sh.	In.
	16	23		I.	Tr.	Eg.
	17	14		I.	Sh.	Eg.
	20	59		II.	Oc.	Dis.
22	1	27	37	II.	Ec.	Re.
	11	25		I.*	Oc.	Dis.
	11	50		III.*	Tr.	In.
	14	31	40	I.*	Ec.	Re.
	14	50		III.	Tr.	Eg.
	15	20		III.	Sh.	In.
	18	18		III.	Sh.	Eg.
23	8	33		I.*	Tr.	In.
	9	25		I.*	Sh.	In.
	10	50		I.*	Tr.	Eg.
	11	42		I.*	Sh.	Eg.
	16	1		II.	Tr.	In.
	17	48		II.	Sh.	In.
	18	51		II.	Tr.	Eg.
	20	38		II.	Sh.	Eg.
24	5	52		I.*	Oc.	Dis.
	9	0	35	I.*	Ec.	Re.
25	3	0		I.	Tr.	In.
	3	54		I.	Sh.	In.
	5	17		I.	Tr.	Eg.
	6	11		I.*	Sh.	Eg.
	10	9		II.*	Oc.	Dis.
	14	46	2	II.	Ec.	Re.
26	0	19		I.	Oc.	Dis.
	1	40		III.	Oc.	Dis.
	3	29	23	I.	Ec.	Re.
	4	40		III.	Oc.	Re.
	5	32	10	III.	Ec.	Dis.
	8	18	46	III.*	Ec.	Re.
	21	26		I.	Tr.	In.
	22	23		I.	Sh.	In.
	23	44		I.	Tr.	Eg.
27	0	40		I.	Sh.	Eg.
	5	12		II.	Tr.	In.
	7	7		II.*	Sh.	In.
	8	2		II.*	Tr.	Eg.
	9	57		II.*	Sh.	Eg.
	18	46		I.	Oc.	Dis.
	21	58	17	I.	Ec.	Re.
28	10	14		IV.*	Oc.	Dis.
	13	5		IV.*	Oc.	Re.
	15	54		I.	Tr.	In.
	16	52		I.	Sh.	In.
	18	10		I.	Tr.	Eg.
	19	9		I.	Sh.	Eg.
	19	40	51	IV.	Ec.	Dis.
	21	52	46	IV.	Ec.	Re.
	23	20		II.	Oc.	Dis.
29	4	4	19	II.	Ec.	Re.
	13	13		I.*	Oc.	Dis.
	15	19		III.	Tr.	In.
	16	27	8	I.	Ec.	Re.
	18	20		III.	Tr.	Eg.
	19	22		III.	Sh.	In.
	22	19		III.	Sh.	Eg.
30	10	21		I.*	Tr.	In.
	11	21		I.*	Sh.	In.
	12	38		I.*	Tr.	Eg.
	13	38		I.*	Sh.	Eg.
	18	24		II.	Tr.	In.
	20	26		II.	Sh.	In.
	21	14		II.	Tr.	Eg.
	23	16		II.	Sh.	Eg.
31	7	40		I.*	Oc.	Dis.
	10	56	3	I.*	Ec.	Re.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

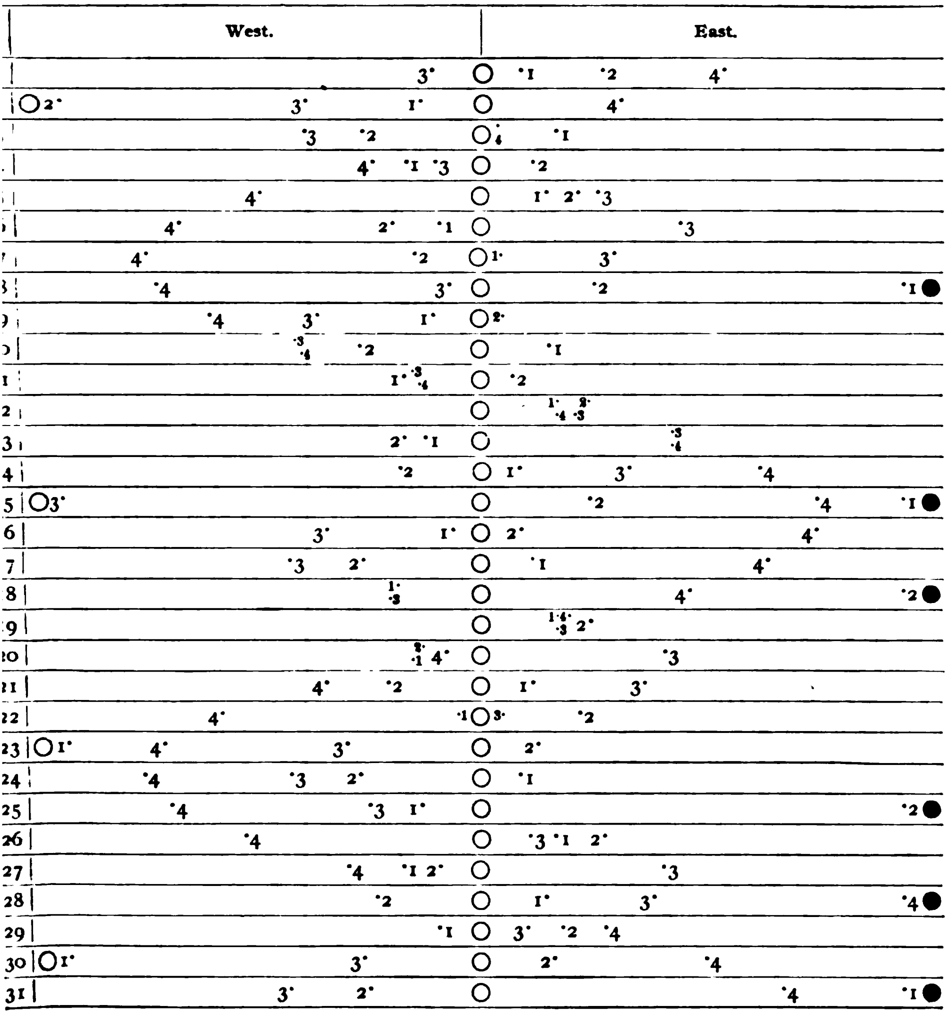
WASHINGTON MEAN TIME.

OCTOBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 10ʰ 30ᵐ for an Inverting Telescope.



WASHINGTON MEAN TIME.

NOVEMBER.

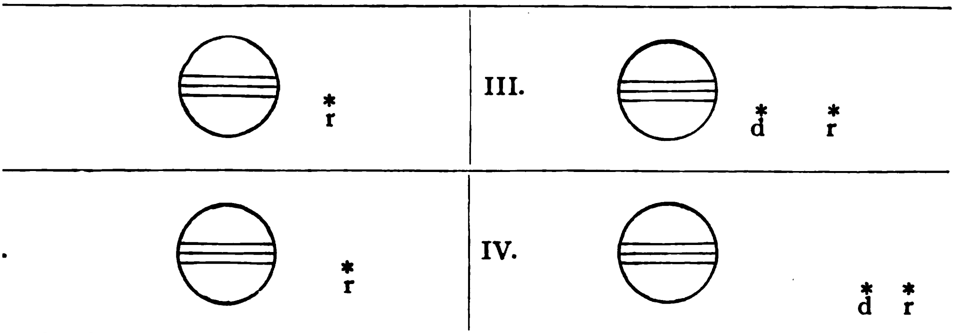
d	h	m	s			
1	4	48		I.	Tr.	In.
	5	50		I.*	Sh.	In.
	7	5		I.*	Tr.	Eg.
	8	7		I.*	Sh.	Eg.
	12	31		II.*	Oc.	Dis.
	17	22	53	II.	Ec.	Re.
2	2	7		I.	Oc.	Dis.
	5	11		III.	Oc.	Dis.
	5	24	53	I.*	Ec.	Re.
	8	14		III.*	Oc.	Re.
	9	34	50	III.*	Ec.	Dis.
	12	20	5	III.*	Ec.	Re.
	23	15		I.	Tr.	In.
3	0	19		I.	Sh.	In.
	1	32		I.	Tr.	Eg.
	2	35		I.	Sh.	Eg.
	7	36		II.*	Tr.	In.
	9	45		II.*	Sh.	In.
	10	26		II.*	Tr.	Eg.
	12	34		II.*	Sh.	Eg.
	20	35		I.	Oc.	Dis.
	23	53	48	I.	Ec.	Re.
4	17	42		I.	Tr.	In.
	18	48		I.	Sh.	In.
	19	59		I.	Tr.	Eg.
	21	4		I.	Sh.	Eg.
5	1	43		II.	Oc.	Dis.
	6	41	15	II.*	Ec.	Re.
	15	2		I.	Oc.	Dis.
	18	22	38	I.	Ec.	Re.
	18	53		III.	Tr.	In.
	19	32		IV.	Tr.	In.
	21	56		III.	Tr.	Eg.
	22	31		IV.	Tr.	Eg.
	23	24		III.	Sh.	In.
6	2	20		III.	Sh.	Eg.
	6	19		IV.*	Sh.	In.
	8	44		IV.*	Sh.	Eg.
	12	10		I.*	Tr.	In.
	13	16		I.*	Sh.	In.
	14	27		I.	Tr.	Eg.
	15	33		I.	Sh.	Eg.
	20	48		II.	Tr.	In.
	23	4		II.	Sh.	In.
	23	39		II.	Tr.	Eg.
7	1	53		II.	Sh.	Eg.
	9	29		I.*	Oc.	Dis.
	12	51	35	I.*	Ec.	Re.
8	6	37		I.*	Tr.	In.
	7	45		I.*	Sh.	In.
	8	54		I.*	Tr.	Eg.
	10	2		I.*	Sh.	Eg.
	14	56		II.	Oc.	Dis.
	19	59	57	II.	Ec.	Re.
9	3	57		I.	Oc.	Dis.
	7	20	25	I.*	Ec.	Re.
	8	49		III.*	Oc.	Dis.
	11	52		III.*	Oc.	Re.
	13	38	7	III.	Ec.	Dis.
	16	22	2	III.	Ec.	Re.
10	1	4		I.	Tr.	In.
	2	14		I.	Sh.	In.
	3	22		I.	Tr.	Eg.
	4	31		I.	Sh.	Eg.
	10	2		II.*	Tr.	In.
	12	23		II.*	Sh.	In.
10	12	52		II.*	Tr.	Eg.
	15	12		II.	Sh.	Eg.
	22	24		I.	Oc.	Dis.
11	1	49	20	I.	Ec.	Re.
	19	32		I.	Tr.	In.
	20	43		I.	Sh.	In.
	21	49		I.	Tr.	Eg.
	23	0		I.	Sh.	Eg.
12	4	8		II.	Oc.	Dis.
	9	18	24	II.*	Ec.	Re.
	16	52		I.	Oc.	Dis.
	20	18	11	I.	Ec.	Re.
	22	32		III.	Tr.	In.
13	1	36		III.	Tr.	Eg.
	3	27		III.	Sh.	In.
	6	21		III.*	Sh.	Eg.
	14	0		I.	Tr.	In.
	15	12		I.	Sh.	In.
	16	17		I.	Tr.	Eg.
	17	29		I.	Sh.	Eg.
	23	16		II.	Tr.	In.
14	1	41		II.	Sh.	In.
	2	6		II.	Tr.	Eg.
	2	9		IV.	Oc.	Dis.
	4	30		II.	Sh.	Eg.
	5	15		IV.	Oc.	Re.
	11	20		I.*	Oc.	Dis.
	14	4	44	IV.	Ec.	Dis.
	14	47	8	I.	Ec.	Re.
	15	59	27	IV.	Ec.	Re.
15	8	28		I.*	Tr.	In.
	9	41		I.*	Sh.	In.
	10	45		I.*	Tr.	Eg.
	11	58		I.*	Sh.	Eg.
	17	22		II.	Oc.	Dis.
	22	37	14	II.	Ec.	Re.
16	5	48		I.*	Oc.	Dis.
	9	15	59	I.*	Ec.	Re.
	12	31		III.*	Oc.	Dis.
	15	36		III.	Oc.	Re.
	17	40	51	III.	Ec.	Dis.
	20	23	24	III.	Ec.	Re.
17	2	55		I.	Tr.	In.
	4	10		I.	Sh.	In.
	5	13		I.	Tr.	Eg.
	6	26		I.*	Sh.	Eg.
	12	30		II.*	Tr.	In.
	15	0		II.	Sh.	In.
	15	21		II.	Tr.	Eg.
	17	49		II.	Sh.	Eg.
18	0	16		I.	Oc.	Dis.
	3	44	54	I.	Ec.	Re.
	21	23		I.	Tr.	In.
	22	39		I.	Sh.	In.
	23	41		I.	Tr.	Eg.
19	0	55		I.	Sh.	Eg.
	6	37		II.*	Oc.	Dis.
	11	55	45	II.*	Ec.	Re.
	18	44		I.	Oc.	Dis.
	22	13	45	I.	Ec.	Re.
20	2	16		III.	Tr.	In.
	5	22		III.*	Tr.	Eg.
	7	30		III.*	Sh.	In.
	10	23		III.*	Sh.	Eg.
	15	51		I.	Tr.	In.
	17	8		I.	Sh.	In.
20	18	9		I.	Tr.	Eg.
	19	24		I.	Sh.	Eg.
21	1	45		II.	Tr.	In.
	4	19		II.	Sh.	In.
	4	36		II.	Tr.	Eg.
	7	8		II.*	Sh.	Eg.
	13	12		I.	Oc.	Dis.
	16	42	42	I.	Ec.	Re.
22	10	19		I.*	Tr.	In.
	11	37		I.*	Sh.	In.
	12	0		IV.*	Tr.	In.
	12	37		I.	Tr.	Eg.
	13	53		I.	Sh.	Eg.
	15	11		IV.	Tr.	Eg.
	19	52		II.	Oc.	Dis.
23	0	45		IV.	Sh.	In.
	1	14	44	II.	Ec.	Re.
	2	53		IV.	Sh.	Eg.
	7	40		I.*	Oc.	Dis.
	11	11	33	I.*	Ec.	Re.
	16	18		III.	Oc.	Dis.
	19	24		III.	Oc.	Re.
	21	43	35	III.	Ec.	Dis.
24	0	24	46	III.	Ec.	Re.
	4	48		I.	Tr.	In.
	6	6		I.*	Sh.	In.
	7	5		I.*	Tr.	Eg.
	8	22		I.*	Sh.	Eg.
	15	1		II.	Tr.	In.
	17	36		II.	Sh.	In.
	17	52		II.	Tr.	Eg.
	20	26		II.	Sh.	Eg.
25	2	8		I.	Oc.	Dis.
	5	40	28	I.*	Ec.	Re.
	23	16		I.	Tr.	In.
26	0	35		I.	Sh.	In.
	1	33		I.	Tr.	Eg.
	2	51		I.	Sh.	Eg.
	9	8		II.*	Oc.	Dis.
	14	33	18	II.	Ec.	Re.
	20	36		I.	Oc.	Dis.
27	0	9	20	I.	Ec.	Re.
	6	6		III.*	Tr.	In.
	9	13		III.*	Tr.	Eg.
	11	33		III.*	Sh.	In.
	14	24		III.	Sh.	Eg.
	17	44		I.	Tr.	In.
	19	4		I.	Sh.	In.
	20	2		I.	Tr.	Eg.
	21	20		I.	Sh.	Eg.
28	4	17		II.	Tr.	In.
	6	56		II.*	Sh.	In.
	7	8		II.*	Tr.	Eg.
	9	45		II.*	Sh.	Eg.
	15	5		I.	Oc.	Dis.
	18	38	17	I.	Ec.	Re.
29	12	12		I.	Tr.	In.
	13	32		I.	Sh.	In.
	14	30		I.	Tr.	Eg.
	15	49		I.	Sh.	Eg.
	22	24		II.	Oc.	Dis.
30	3	52	25	II.	Ec.	Re.
	9	33		I.*	Oc.	Dis.
	13	7	8	I.	Ec.	Re.
	19	12		IV.	Oc.	Dis.
	20	10		III.	Oc.	Dis.
	22	25		IV.	Oc.	Re.
	23	16		III.	Oc.	Re.

Note.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

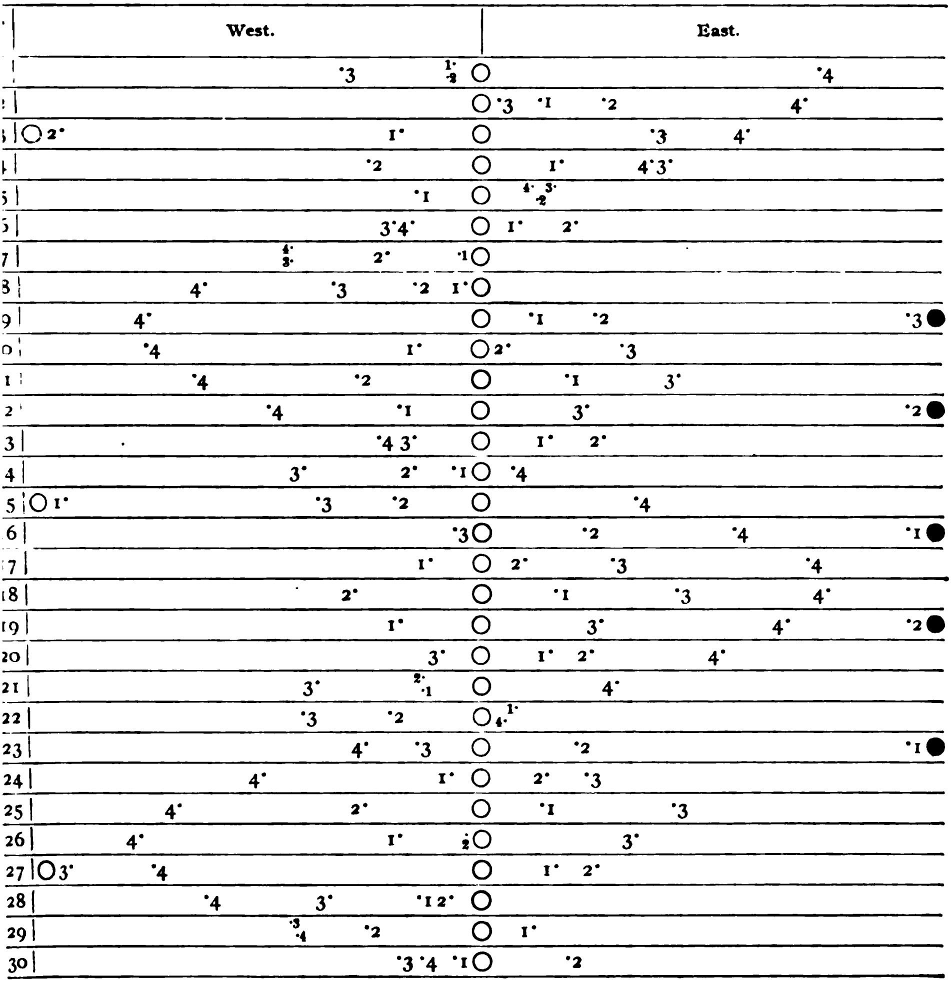
WASHINGTON MEAN TIME.

NOVEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 9ʰ 0ᵐ for an Inverting Telescope.



WASHINGTON MEAN TIME.

DECEMBER.

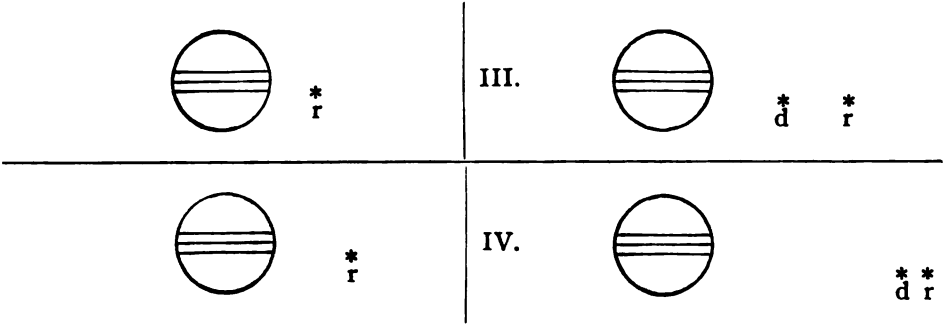
d	h	m	s			
1	1	46	3	III.	Ec.	Dis.
	4	25	51	III.	Ec.	Re.
	6	41		I.*	Tr.	In.
	8	1		I.*	Sh.	In.
	8	30	56	IV.*	Ec.	Dis.
	8	58		I.*	Tr.	Eg.
	10	5	12	IV.*	Ec.	Re.
	10	18		I.*	Sh.	Eg.
	17	34		II.	Tr.	In.
	20	15		II.	Sh.	In.
	20	25		II.	Tr.	Eg.
	23	4		II.	Sh.	Eg.
2	4	2		I.	Oc.	Dis.
	7	36	3	I.*	Ec.	Re.
3	1	10		I.	Tr.	In.
	2	30		I.	Sh.	In.
	3	27		I.	Tr.	Eg.
	4	47		I.	Sh.	Eg.
	11	41		II.*	Oc.	Dis.
	17	11	2	II.	Ec.	Re.
	22	30		I.	Oc.	Dis.
4	2	4	55	I.	Ec.	Re.
	10	2		III.*	Tr.	In.
	13	9		III.	Tr.	Eg.
	15	36		III.	Sh.	In.
	18	26		III.	Sh.	Eg.
	19	38		I.	Tr.	In.
	20	59		I.	Sh.	In.
	21	56		I.	Tr.	Eg.
	23	16		I.	Sh.	Eg.
5	6	51		II.*	Tr.	In.
	9	34		II.*	Sh.	In.
	9	43		II.*	Tr.	Eg.
	12	22		II.	Sh.	Eg.
	16	59		I.	Oc.	Dis.
	20	33	51	I.	Ec.	Re.
6	14	7		I.	Tr.	In.
	15	28		I.	Sh.	In.
	16	24		I.	Tr.	Eg.
	17	44		I.	Sh.	Eg.
7	0	59		II.	Oc.	Dis.
	6	30	16	II.*	Ec.	Re.
	11	27		I.*	Oc.	Dis.
	15	2	43	I.	Ec.	Re.
8	0	6		III.	Oc.	Dis.
	3	14		III.	Oc.	Re.
	5	48	34	III.*	Ec.	Dis.
	8	26	59	III.*	Ec.	Re.
	8	36		I.*	Tr.	In.
	9	57		I.*	Sh.	In.
	10	53		I.*	Tr.	Eg.
	12	14		I.	Sh.	Eg.
	20	9		II.	Tr.	In.
	22	52		II.	Sh.	In.
	23	1		II.	Tr.	Eg.
9	1	40		II.	Sh.	Eg.
	5	36		IV.*	Tr.	In.
	5	56		I.*	Oc.	Dis.
	8	52		IV.*	Tr.	Eg.
	9	31	37	I.*	Ec.	Re.
	19	11		IV.	Sh.	In.
	21	1		IV.	Sh.	Eg.
10	3	5		I.	Tr.	In.
	4	26		I.	Sh.	In.
	5	22		I.*	Tr.	Eg.
	6	42		I.*	Sh.	Eg.
10	14	17		II.	Oc.	Dis.
	19	48	56	II.	Ec.	Re.
11	0	25		I.	Oc.	Dis.
	4	0	28	I.	Ec.	Re.
	14	2		III.	Tr.	In.
	17	9		III.	Tr.	Eg.
	19	39		III.	Sh.	In.
	21	34		I.	Tr.	In.
	22	28		III.	Sh.	Eg.
	22	55		I.	Sh.	In.
	23	51		I.	Tr.	Eg.
12	1	11		I.	Sh.	Eg.
	9	28		II.*	Tr.	In.
	12	11		II.	Sh.	In.
	12	19		II.	Tr.	Eg.
	14	59		II.	Sh.	Eg.
	18	54		I.	Oc.	Dis.
	22	29	24	I.	Ec.	Re.
13	16	3		I.	Tr.	In.
	17	24		I.	Sh.	In.
	18	20		I.	Tr.	Eg.
	19	40		I.	Sh.	Eg.
14	3	37		II.	Oc.	Dis.
	9	8	16	II.*	Ec.	Re.
	13	23		I.	Oc.	Dis.
	16	58	16	I.	Ec.	Re.
15	4	9		III.	Oc.	Dis.
	7	16		III.*	Oc.	Re.
	9	51	32	III.*	Ec.	Dis.
	10	32		I.*	Tr.	In.
	11	53		I.	Sh.	In.
	12	28	34	III.	Ec.	Re.
	12	49		I.	Tr.	Eg.
	14	9		I.	Sh.	Eg.
	22	47		II.	Tr.	In.
16	1	29		II.	Sh.	In.
	1	38		II.	Tr.	Eg.
	4	17		II.	Sh.	Eg.
	7	52		I.*	Oc.	Dis.
	11	27	10	I.	Ec.	Re.
17	5	1		I.	Tr.	In.
	6	22		I.*	Sh.	In.
	7	18		I.*	Tr.	Eg.
	8	38		I.*	Sh.	Eg.
	13	16		IV.	Oc.	Dis.
	16	32		IV.	Oc.	Re.
	16	56		II.	Oc.	Dis.
	22	26	59	II.	Ec.	Re.
18	2	21		I.	Oc.	Dis.
	3	0	13	IV.	Ec.	Dis.
	4	7	52	IV.	Ec.	Re.
	5	56	1	I.*	Ec.	Re.
	18	6		III.	Tr.	In.
	21	13		III.	Tr.	Eg.
	23	30		I.	Tr.	In.
	23	42		III.	Sh.	In.
19	0	51		I.	Sh.	In.
	1	47		I.	Tr.	Eg.
	2	30		III.	Sh.	Eg.
	3	7		I.	Sh.	Eg.
	12	6		II.	Tr.	In.
	14	48		II.	Sh.	In.
	14	57		II.	Tr.	Eg.
	17	36		II.	Sh.	Eg.
	20	50		I.	Oc.	Dis.
20	0	24	56	I.	Ec.	Re.
20	17	59		I.	Tr.	In.
	19	20		I.	Sh.	In.
	20	17		I.	Tr.	Eg.
	21	36		I.	Sh.	Eg.
21	6	16		II.*	Oc.	Dis.
	11	46	25	II.	Ec.	Re.
	15	19		I.	Oc.	Dis.
	18	53	47	I.	Ec.	Re.
22	8	15		III.*	Oc.	Dis.
	11	22		III.	Oc.	Re.
	12	29		I.	Tr.	In.
	13	49		I.	Sh.	In.
	13	54	24	III.	Ec.	Dis.
	14	46		I.	Tr.	Eg.
	16	5		I.	Sh.	Eg.
	16	30	0	III.	Ec.	Re.
23	1	26		II.	Tr.	In.
	4	6		II.	Sh.	In.
	4	17		II.	Tr.	Eg.
	6	54		II.*	Sh.	Eg.
	9	49		I.*	Oc.	Dis.
	13	22	40	I.	Ec.	Re.
24	6	58		I.*	Tr.	In.
	8	18		I.*	Sh.	In.
	9	15		I.*	Tr.	Eg.
	10	34		I.*	Sh.	Eg.
	19	37		II.	Oc.	Dis.
25	1	5	10	II.	Ec.	Re.
	4	18		I.	Oc.	Dis.
	7	51	31	I.*	Ec.	Re.
	22	14		III.	Tr.	In.
26	0	13		IV.	Tr.	In.
	1	21		III.	Tr.	Eg.
	1	27		I.	Tr.	In.
	2	47		I.	Sh.	In.
	3	28		IV.	Tr.	Eg.
	3	45		I.	Tr.	Eg.
	3	45		III.	Sh.	In.
	5	3		I.	Sh.	Eg.
	6	31		III.*	Sh.	Eg.
	13	41		IV.	Sh.	In.
	14	46		II.	Tr.	In.
	15	6		IV.	Sh.	Eg.
	17	24		II.	Sh.	In.
	17	37		II.	Tr.	Eg.
	20	12		II.	Sh.	Eg.
	22	47		I.	Oc.	Dis.
27	2	20	26	I.	Ec.	Re.
	19	57		I.	Tr.	In.
	21	16		I.	Sh.	In.
	22	14		I.	Tr.	Eg.
	23	32		I.	Sh.	Eg.
28	8	58		II.*	Oc.	Dis.
	14	24	41	II.	Ec.	Re.
	17	17		I.	Oc.	Dis.
	20	49	16	I.	Ec.	Re.
29	12	26		III.	Oc.	Dis.
	14	26		I.	Tr.	In.
	15	32		III.	Oc.	Re.
	15	45		I.	Sh.	In.
	16	44		I.	Tr.	Eg.
	17	57	47	III.	Ec.	Dis.
	18	1		I.	Sh.	Eg.
	20	31	58	III.	Ec.	Re.
30	4	7		II.	Tr.	In.
	6	43		II.*	Sh.	In.
	6	58		II.*	Tr.	Eg.
	9	30		II.*	Sh.	Eg.
	11	46		I.	Oc.	Dis.
	15	18	8	I.	Ec.	Re.
31	8	56		I.*	Tr.	In.
	10	14		I.	Sh.	In.
	11	13		I.	Tr.	Eg.
	12	30		I.	Sh.	Eg.
	22	20		II.	Oc.	Dis.

NOTE.—In. denotes ingress; Eg., egress; Dis., disappearance; Re., reappearance; Ec., eclipse.
Oc. denotes occultation; Tr., transit of the satellite; Sh., transit of the shadow; * Visible at Washington.

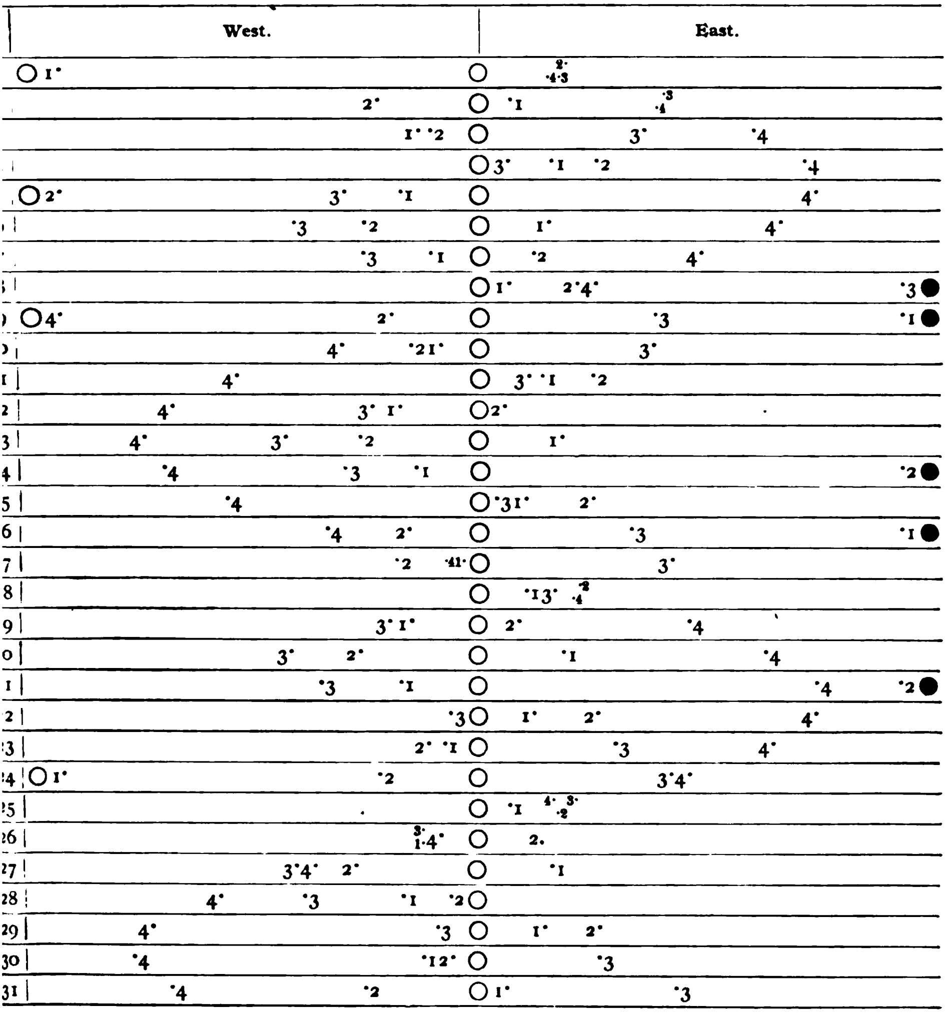
WASHINGTON MEAN TIME.

DECEMBER.

Phases of the Eclipses of the Satellites for an Inverting Telescope.



Configurations at 8ʰ 0ᵐ for an Inverting Telescope.



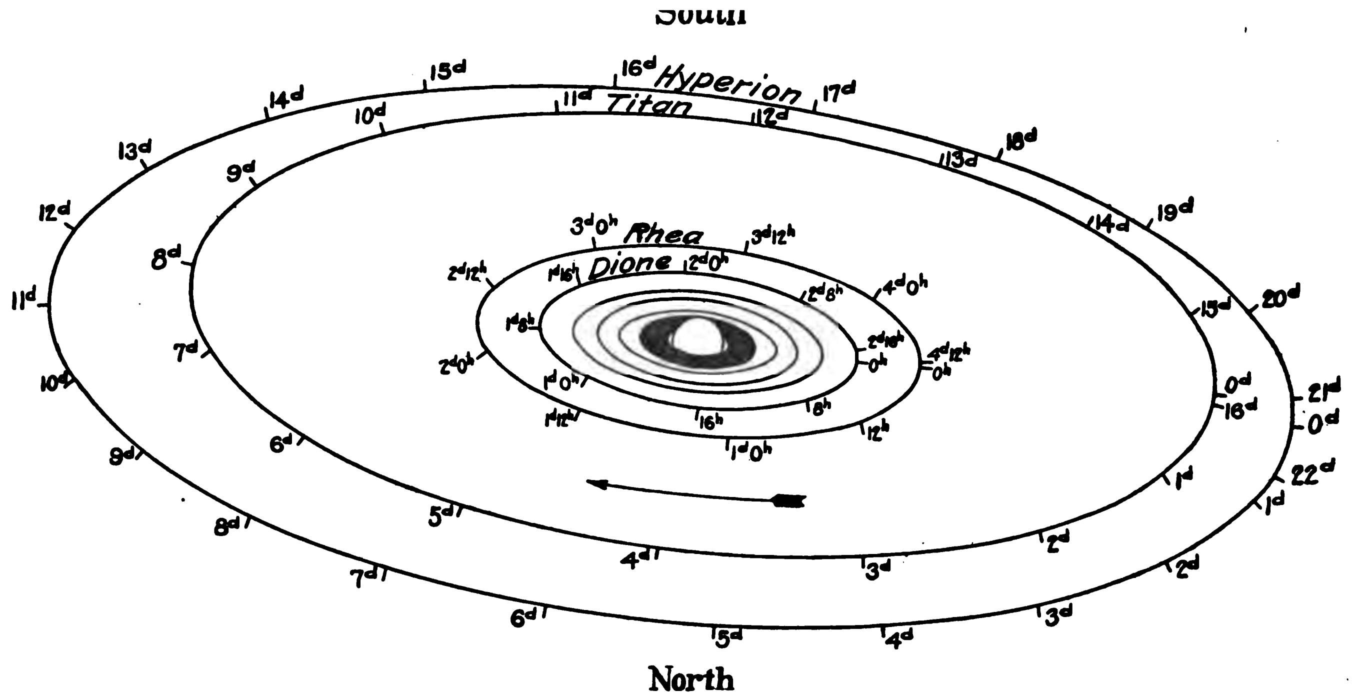
ELEMENTS FOR DETERMINING THE GEOCENTRIC POSITION, APPEARANCE, AND MAGNITUDE OF SATURN'S RINGS.

Washington Mean Noon.		*a*	*b*	*p*	*l*	*l′*	*u*	*u′*	Stellar Mag.
		Outer Major Axis.	Outer Minor Axis.	Inclination of Northern Semi-minor Axis to Circle of Declination from North to East.	The elevation of the Earth above the Plane of the Rings.	The Elevation of the Sun above the Plane of the Rings.	Earth's Longitude from Saturn counted on Plane of Rings from the Rings' Ascending Node on—		
							Equator.	Ecliptic.	
		″	″	° ′	° ′	° ′	° ′	° ′	
Jan.	0	46.61	−20.82	−5 56.6	−26 32.1	−26 32.4	143 18.5	100 51.1	−0.2
	10	46.34	20.76	5 52.6	26 37.4	26 31.0	142 27.0	99 59.7	0.2
	20	45.90	20.62	5 49.0	26 42.2	26 29.6	141 41.6	99 14.4	−0.1
	30	45.33	20.41	5 46.0	26 46.4	26 28.0	141 4.9	98 37.7	0.0
Feb.	9	44.65	20.15	5 43.9	26 49.9	26 26.4	140 38.8	98 11.6	0.0
	19	43.90	−19.85	−5 42.8	−26 52.8	−26 24.8	140 24.5	97 57.4	+0.1
Mar.	1	43.11	19.52	5 42.7	26 54.9	26 23.0	140 22.7	97 55.6	0.1
	11	42.31	19.17	5 43.7	26 56.2	26 21.2	140 33.5	98 6.5	0.2
	21	41.54	18.82	5 45.7	26 56.7	26 19.3	140 56.6	98 29.7	0.2
	31	40.80	18.48	5 48.6	26 56.3	26 17.4	141 31.2	99 4.4	0.3
Apr.	10	40.11	−18.16	−5 52.4	−26 55.0	−26 15.3	142 16.5	99 49.7	+0.3
	20	39.48	17.85	5 56.8	26 52.4	26 13.2	143 11.2	100 44.5	0.3
	30	38.93	17.56	6 1.8	26 48.8	26 11.0	144 14.2	101 47.5	0.3
May	10	38.46	17.30	6 7.0	26 43.8	26 8.8	145 24.2	102 57.5	0.3
	20	38.07	17.06	6 12.6	26 37.6	26 6.5	146 39.8	104 13.2	0.3
	30	37.77	−16.85	−6 18.2	−26 30.1	−26 4.1	147 59.9	105 33.3	+0.3
June	9	37.56	16.67	6 23.8	26 21.2	26 1.6	149 23.1	106 56.6	0.3
	19	37.43	16.52	6 29.3	26 11.2	25 59.1	150 48.3	108 21.9	0.2
	29	37.39	16.39	6 34.5	26 0.0	25 56.5	152 14.2	109 47.9	0.2
July	9	37.44	16.29	6 39.4	25 48.0	25 53.8	153 39.7	111 13.4	0.2
	19	37.58	−16.23	−6 43.9	−25 35.1	−25 51.1	155 3.6	112 37.4	+0.3
	29	37.81	16.20	6 48.1	25 21.9	25 48.3	156 24.9	113 58.7	0.3
Aug.	8	38.12	16.20	6 51.7	25 8.5	25 45.4	157 42.3	115 16.2	0.3
	18	38.52	16.23	6 54.9	24 55.2	25 42.5	158 54.7	116 28.7	0.4
	28	39.00	16.30	6 57.7	24 42.4	25 39.5	160 1.1	117 35.0	0.4
Sept.	7	39.56	−16.41	−7 0.0	−24 30.6	−25 36.4	161 0.2	118 34.2	+0.4
	17	40.19	16.56	7 1.8	24 20.1	25 33.2	161 51.1	119 25.2	0.4
	27	40.88	16.75	7 3.3	24 11.2	25 29.9	162 32.7	120 6.8	0.3
Oct.	7	41.63	16.98	7 4.3	24 4.6	25 26.6	163 4.0	120 38.2	0.3
	17	42.41	17.25	7 5.0	24 0.3	25 23.3	163 24.2	120 58.5	0.3
	27	43.20	−17.55	−7 5.2	−23 58.7	−25 19.9	163 32.9	121 7.2	+0.2
Nov.	6	43.98	17.88	7 5.2	23 59.9	25 16.4	163 29.5	121 3.9	0.2
	16	44.71	18.23	7 4.7	24 3.7	25 12.8	163 14.4	120 48.9	+0.1
	26	45.37	18.58	7 3.9	24 10.2	25 9.2	162 48.3	120 22.7	0.0
Dec.	6	45.92	18.91	7 2.7	24 18.9	25 5.5	162 12.2	119 46.7	−0.1
	16	46.33	−19.20	−7 1.1	−24 29.2	−25 1.7	161 28.0	119 2.6	−0.1
	26	46.58	19.45	6 59.3	24 40.6	24 57.9	160 38.1	118 12.7	0.2
	31	46.64	−19.55	−6 58.3	−24 46.5	−24 56.0	160 11.9	117 46.6	−0.2

The factor to be multiplied by *a* and *b* to obtain the axes of—

The inner ellipse of the outer ring=0.8801, log factor=9.9445
The outer ellipse of the inner ring=0.8599, log factor=9.9344
The inner ellipse of the inner ring=0.6650, log factor=9.8228
The inner ellipse of the dusky ring=0.5486, log factor=9.7392

NOTE.—The negative sign of *l* indicates that the visible surface of the rings is the southern one.



APPARENT ORBITS OF THE SEVEN INNER SATELLITES OF SATURN,

AT DATE OF OPPOSITION, JANUARY 4, 1916,

AS SEEN IN AN INVERTING TELESCOPE.

Names of the Satellites.	
I.	Mimas.
II.	Enceladus.
III.	Tethys.
IV.	Dione.
V.	Rhea.
VI.	Titan.
VII.	Hyperion.
VIII.	Iapetus.
IX.	Phœbe.

Mean Synodic Periods.		
	d	h
I.	0	22.6
II.	1	8.9
III.	1	21.3
IV.	2	17.7
V.	4	12.5
VI.	15	23.3
VII.	21	7.6
VIII.	79	22.1
IX.	523	15.6

WASHINGTON MEAN TIME OF GREATEST ELONGATION, ETC.

In the diagram on the preceding page, the points of the orbits marked "*o*" are those of the eastern elongation, as seen in an inverting telescope. The times of these elongations may be found from the following tables, and the apparent position of a satellite at any other time may be marked on the diagram by setting off on the proper orbit the elapsed interval in days and hours since the last eastern elongation. The orbits of the five inner satellites are regarded as circular and the time of any elongation not given in the tables may be readily found from those given by adding or subtracting the proper multiple of the mean synodic period. Mimas can be seen only within a few hours of each elongation, and the time of every elongation visible at Washington is given. For Titan, Hyperion and Iapetus the eccentricity is taken into account, and the times both of the elongations and of the conjunctions are given. The following abbreviations are used in the tables:

E., East Elongation.	I., Inferior Conjunction (north of planet).
W., West Elongation.	S., Superior Conjunction (south of planet).

MIMAS.

Greatest Elongations Visible at Washington.

	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	1	15.6 W.	Jan.	22	9.0 W.	Feb.	16	8.4 E.	Oct.	18	11.9 E.	Nov.	18	14.2 E.	Dec.	12	14.9 W.
	2	14.2 W.		23	7.6 W.		17	7.0 E.		22	17.8 W.		19	12.8 E.		13	13.5 W.
	3	12.8 W.		24	6.3 W.		20	14.1 W.		23	16.4 W.		20	11.4 E.		14	12.1 W.
	4	11.4 W.		25	16.2 E.		21	12.7 W.		24	15.0 W.		21	10.0 E.		15	10.8 W.
	5	10.0 W.		26	14.8 E.		22	11.3 W.		25	13.6 W.		22	8.6 E.		16	9.4 W.
	6	8.6 W.		27	13.4 E.		23	10.0 W.		26	12.2 W.		24	17.3 W.		17	8.0 W.
	7	7.2 W.		28	12.0 E.		24	8.6 W.		27	10.8 W.		25	15.9 W.		18	6.6 W.
	8	5.8 W.		29	10.6 E.		25	7.2 W.		30	17.9 E.		26	14.5 W.		18	17.8 E.
	8	17.1 E.		30	9.2 E.	Mar.	1	13.0 E.		31	16.5 E.		27	13.1 W.		19	16.4 E.
	9	15.7 E.		31	7.8 E.		2	11.7 E.	Nov.	1	15.1 E.		28	11.7 W.		20	15.0 E.
	10	14.3 E.	Feb.	1	6.5 E.		3	10.3 E.		2	13.7 E.		29	10.4 W.		21	13.6 E.
	11	12.9 E.		3	15.0 W.		4	8.9 E.		3	12.3 E.		30	9.0 W.		22	12.2 E.
	12	11.6 E.		4	13.6 W.		5	7.5 E.		4	11.0 E.	Dec.	2	17.4 E.		23	10.8 E.
	13	10.2 E.		5	12.2 W.		9	13.2 W.		5	9.6 E.		3	16.0 E.		24	9.4 E.
	14	8.8 E.		6	10.8 W.		10	11.9 W.		8	16.8 W.		4	14.6 E.		25	8.1 E.
	15	7.4 E.		7	9.5 W.		11	10.5 W.		9	15.4 W.		5	13.2 E.		26	6.7 E.
	16	6.0 E.		8	8.1 W.		12	9.1 W.		10	14.1 W.		6	11.8 E.		26	18.1 W.
	17	16.0 W.		9	6.7 W.		13	7.7 W.		11	12.7 W.		7	10.4 E.		27	16.7 W.
	18	14.6 W.		12	13.9 E.		. .	. .		12	11.3 W.		8	9.0 E.		28	15.3 W.
	19	13.2 W.		13	12.5 E.	Oct.	15	16.0 E.		13	9.9 W.		9	7.7 E.		29	13.9 W.
	20	11.8 W.		14	11.1 E.		16	14.6 E.		16	16.9 E.		10	17.7 W.		30	12.5 W.
	21	10.4 W.		15	9.8 E.		17	13.3 E.		17	15.5 E.		11	16.3 W.		31	11.1 W.

ENCELADUS.

	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	1	7.1 E.	Jan.	14	23.9 E.	Jan.	28	16.7 E.	Feb.	11	9.5 E.	Feb.	25	2.4 E.	Mar.	10	19.3 E
	2	16.0 E.		16	8.8 E.		30	1.6 E.		12	18.4 E.		26	11.3 E.		12	4.2 E
	4	0.9 E.		17	17.6 E.		31	10.4 E.		14	3.3 E.		27	20.2 E.		13	13.1 E.
	5	9.8 E.		19	2.5 E.	Feb.	1	19.3 E.		15	12.2 E.	Mar.	1	5.0 E.		14	22.0 E
	6	18.6 E.		20	11.4 E.		3	4.2 E.		16	21.0 E.		2	13.9 E.		16	6.8 E.
	8	3.5 E.		21	20.3 E.		4	13.1 E.		18	5.9 E.		3	22.8 E.		17	15.7 E.
	9	12.4 E.		23	5.2 E.		5	22.0 E.		19	14.8 E.		5	7.7 E.		19	0.6 E
	10	21.3 E.		24	14.0 E.		7	6.9 E.		20	23.7 E.		6	16.6 E.		20	9.5 E.
	12	6.1 E.		25	22.9 E.		8	15.7 E.		22	8.6 E.		8	1.5 E.		21	18.4 E.
	13	15.0 E.		27	7.8 E.		10	0.6 E.		23	17.5 E.		9	10.4 E.		23	3.3 E.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

ENCELADUS—(*Concluded*).

	d	h		d	h		d	h		d	h		d	h		d	h
.	24	12.2 E.	Sept.	21	11.0 E.	Oct.	12	0.3 E.	Nov.	1	13.6 E.	Nov.	22	2.8 E.	Dec.	12	15.9 E.
	25	21.1 E.		22	19.9 E.		13	9.2 E.		2	22.5 E.		23	11.7 E.		14	0.8 E.
	27	6.0 E.		24	4.8 E.		14	18.1 E.		4	7.4 E.		24	20.5 E.		15	9.7 E.
	28	14.9 E.		25	13.7 E.		16	3.0 E.		5	16.2 E.		26	5.4 E.		16	18.5 E.
	29	23.8 E.		26	22.6 E.		17	11.9 E.		7	1.1 E.		27	14.3 E.		18	3.4 E.
	31	8.7 E.		28	7.4 E.		18	20.8 E.		8	10.0 E.		28	23.2 E.		19	12.3 E.
r.	1	17.6 E.		29	16.3 E.		20	5.6 E.		9	18.9 E.		30	8.0 E.		20	21.2 E.
	3	2.5 E.	Oct.	1	1.2 E.		21	14.5 E.		11	3.8 E.	Dec.	1	16.9 E.		22	6.0 E.
	4	11.4 E.		2	10.1 E.		22	23.4 E.		12	12.6 E.		3	1.8 E.		23	14.9 E.
	5	20.3 E.		3	19.0 E.		24	8.3 E.		13	21.5 E.		4	10.7 E.		24	23.8 E.
	7	5.2 E.		5	3.9 E.		25	17.2 E.		15	6.4 E.		5	19.5 E.		26	8.7 E.
	8	14.0 E.		6	12.8 E.		27	2.1 E.		16	15.3 E.		7	4.4 E.		27	17.5 E.
	. .	. .		7	21.7 E.		28	11.0 E.		18	0.1 E.		8	13.3 E.		29	2.4 E.
pt.	18	17.2 E.		9	6.6 E.		29	19.8 E.		19	9.0 E.		9	22.2 E.		30	11.3 E.
	20	2.1 E.		10	15.4 E.		31	4.7 E.		20	17.9 E.		11	7.0 E.		31	20.2 E.

TETHYS.

	d	h		d	h		d	h		d	h		d	h		d	h
n.	1	5.0 E.	Feb.	6	1.6 E.	Mar.	13	22.5 E.	Sept.	16	22.6 E.	Oct.	22	19.5 E.	Nov.	27	16.2 E.
	3	2.3 E.		7	22.9 E.		15	19.8 E.		18	19.9 E.		24	16.8 E.		29	13.5 E.
	4	23.6 E.		9	20.2 E.		17	17.1 E.		20	17.2 E.		26	14.1 E.	Dec.	1	10.8 E.
	6	20.9 E.		11	17.5 E.		19	14.4 E.		22	14.5 E.		28	11.4 E.		3	8.1 E.
	8	18.2 E.		13	14.8 E.		21	11.8 E.		24	11.8 E.		30	8.7 E.		5	5.4 E.
	10	15.4 E.		15	12.1 E.		23	9.1 E.		26	9.2 E.	Nov.	1	6.0 E.		7	2.6 E.
	12	12.7 E.		17	9.4 E.		25	6.4 E.		28	6.5 E.		3	3.3 E.		8	23.9 E.
	14	10.0 E.		19	6.7 E.		27	3.7 E.		30	3.8 E.		5	0.6 E.		10	21.2 E.
	16	7.3 E.		21	4.0 E.		29	1.1 E.	Oct.	2	1.1 E.		6	21.9 E.		12	18.5 E.
	18	4.6 E.		23	1.3 E.		30	22.4 E.		3	22.4 E.		8	19.2 E.		14	15.8 E.
	20	1.9 E.		24	22.6 E.	Apr.	1	19.7 E.		5	19.7 E.		10	16.5 E.		16	13.1 E.
	21	23.2 E.		26	20.0 E.		3	17.0 E.		7	17.0 E.		12	13.8 E.		18	10.4 E.
	23	20.5 E.		28	17.3 E.		5	14.4 E.		9	14.4 E.		14	11.1 E.		20	7.6 E.
	25	17.8 E.	Mar.	2	14.6 E.		7	11.7 E.		11	11.7 E.		16	8.4 E.		22	4.9 E.
	27	15.1 E.		4	11.9 E.		9	9.0 E.		13	9.0 E.		18	5.7 E.		24	2.2 E.
	29	12.4 E.		6	9.2 E.		11	6.4 E.		15	6.3 E.		20	3.0 E.		25	23.5 E.
	31	9.7 E.		8	6.5 E.		13	3.7 E.		17	3.6 E.		22	0.3 E.		27	20.8 E.
eb.	2	7.0 E.		10	3.8 E.		15	1.0 E.		19	0.9 E.		23	21.6 E.		29	18.1 E.
	4	4.3 E.		12	1.2 E.		. .	. .		20	22.2 E.		25	18.9 E.		31	15.4 E.

DIONE.

	d	h		d	h		d	h		d	h		d	h		d	h
an.	1	1.0 E.	Feb.	5	14.5 E.	Mar.	13	4.5 E.	Sept.	18	4.8 E.	Oct.	23	18.9 E.	Nov.	28	8.6 E.
	3	18.6 E.		8	8.2 E.		15	22.2 E.		20	22.5 E.		26	12.6 E.	Dec.	1	2.2 E.
	6	12.3 E.		11	1.8 E.		18	15.9 E.		23	16.2 E.		29	6.2 E.		3	19.9 E.
	9	5.9 E.		13	19.5 E.		21	9.6 E.		26	9.9 E.		31	23.9 E.		6	13.5 E.
	11	23.6 E.		16	13.2 E.		24	3.3 E.		29	3.6 E.	Nov.	3	17.6 E.		9	7.2 E.
	14	17.2 E.		19	6.9 E.		26	21.0 E.	Oct.	1	21.3 E.		6	11.3 E.		12	0.8 E.
	17	10.9 E.		22	0.6 E.		29	14.8 E.		4	15.0 E.		9	4.9 E.		14	18.5 E.
	20	4.5 E.		24	18.2 E.	Apr.	1	8.5 E.		7	8.8 E.		11	22.6 E.		17	12.1 E.
	22	22.2 E.		27	12.0 E.		4	2.2 E.		10	2.4 E.		14	16.3 E.		20	5.8 E.
	25	15.8 E.	Mar.	2	5.6 E.		6	19.9 E.		12	20.1 E.		17	9.9 E.		22	23.4 E.
	28	9.5 E.		4	23.3 E.		9	13.7 E.		15	13.8 E.		20	3.6 E.		25	17.0 E.
	31	3.2 E.		7	17.0 E.		12	7.4 E.		18	7.5 E.		22	21.3 E.		28	10.7 E.
eb.	2	20.8 E.		10	10.8 E.		. .	. .		21	1.2 E.		25	14.9 E.		31	4.3 E.

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

RHEA.				TITAN.				HYPERION.			
	d h		d h		d h		d h		d		d
Jan.	2 12.8 E.	Sept.	26 7.6 E.	Jan.	2 23.9 E.	Oct.	5 21.5 I.	Jan.	1.3 W.	Sept.	7.9 I.
	7 1.1 E.		30 20.1 E.		6 23.2 I.		9 19.9 W.		7.0 S.		13.8 W.
	11 13.4 E.	Oct.	5 8.5 E.		10 20.1 W.		13 21.1 S.		11.7 E.		19.3 S.
	16 1.7 E.		9 21.0 E.		14 19.4 S.		17 22.3 E.		16.5 I.		24.1 E.
	20 14.0 E.		14 9.4 E.		18 21.3 E.		21 20.7 I.		22.4 W.		29.3 I.
	25 2.4 E.		18 21.9 E.		22 20.7 I.		25 18.9 W.		28.2 S.	Oct.	5.1 W.
	29 14.7 E.		23 10.3 E.		26 17.6 W.		29 20.0 S.	Feb.	1.8 E.		10.6 S.
Feb.	3 3.1 E.		27 22.8 E.		30 16.9 S.	Nov.	2 21.1 E.		6.7 I.		15.4 E.
	7 15.4 E.	Nov.	1 11.2 E.	Feb.	3 19.0 E.		6 19.3 I.		12.6 W.		20.6 I.
	12 3.8 E.		5 23.6 E.		7 18.6 I.		10 17.4 W.		18.3 S.		26.4 W.
	16 16.2 E.		10 11.9 E.		11 15.6 W.		14 18.3 S.		23.0 E.		31.9 S.
	21 4.6 E.		15 0.3 E.		15 15.0 S.		18 19.3 E.		27.8 I.	Nov.	5.7 E.
	25 17.1 E.		19 12.7 E.		19 17.2 E.		22 17.4 I.	Mar.	5.7 W.		10.9 I.
Mar.	2 5.5 E.		24 1.0 E.		23 17.0 I.		26 15.4 W.		11.5 S.		16.8 W.
	6 18.0 E.		28 13.4 E.		27 14.1 W.		30 16.2 S.		16.2 E.		22.2 S.
	11 6.4 E.	Dec.	3 1.7 E.	Mar.	3 13.7 S.	Dec.	4 17.0 E.		21.1 I.		27.0 E.
	15 18.9 E.		7 14.0 E.		7 16.0 E.		8 15.1 I.		27.0 W.	Dec.	2.2 I.
	20 7.4 E.		12 2.4 E.		11 16.0 I.		12 13.0 W.	Apr.	1.7 S.		8.0 W.
	24 19.9 E.		16 14.7 E.		15 13.2 W.		16 13.6 S.		6.4 E.		13.4 S.
	29 8.4 E.		21 3.0 E.		19 12.9 S.		20 14.4 E.		11.3 I.		18.2 E.
Apr.	2 20.9 E.		25 15.3 E.		23 15.4 E.		24 12.6 I.		17.2 W.		23.4 I.
	. . . .		30 3.6 E.		. . . .		28 10.3 W.		. . .		29.2 W.

IAPETUS.

	d		d		d		d		d		d
Jan.	20.0 E.	Feb.	28.4 W.	Apr.	9.4 E.	Sept.	19.1 E.	Oct.	28.9 W.	Dec.	7.5 E.
Feb.	9.3 I.	Mar.	19.6 S.		. .	Oct.	9.8 I.	Nov.	17.1 S.		27.6 I.

NINTH SATELLITE OF SATURN.

DIFFERENTIAL COORDINATES OF PHŒBE FOR 1915.

Washington Mean Noon.	$\alpha_{Ph.}-\alpha_{Sat.}$	$\delta_{Ph.}-\delta_{Sat.}$	Washington Mean Noon.	$\alpha_{Ph.}-\alpha_{Sat.}$	$\delta_{Ph.}-\delta_{Sat.}$	Washington Mean Noon.	$\alpha_{Ph.}-\alpha_{Sat.}$	$\delta_{Ph.}-\delta_{Sat.}$
	m s	′ ″		m s	′ ″		m s	′ ″
Jan. 1	−2 25.4	−2 11	Apr. 7	−1 4.1	−3 2	Sept. 30	+2 9.7	−0 36
5	2 26.1	2 25	11	0 56.8	2 54	Oct. 4	2 8.0	0 30
9	2 26.5	2 38	15	0 49.4	2 45	8	2 6.0	0 23
13	2 26.5	2 50	19	0 41.8	2 36	12	2 3.8	0 15
17	2 26.2	3 2	23	0 34.1	2 27	16	2 1.4	−0 6
21	2 25.4	3 12	27	0 26.3	2 19	20	1 58.9	+0 2
25	2 24.4	3 22	May 1	0 18.4	2 10	24	1 56.1	0 12
29	2 22.9	3 30	5	0 10.5	2 2	28	1 53.2	0 21
Feb. 2	2 21.1	3 38	9	−0 2.6	1 54	Nov. 1	1 50.1	0 31
6	2 18.9	3 44	13	+0 5.4	1 47	5	1 46.8	0 41
10	2 16.4	3 49	17	+0 13.2	−1 40	9	1 43.3	0 52
14	2 13.4	3 52		. . .	. . .	13	1 39.7	1 2
18	2 10.1	3 54	Aug. 13	+2 9.2	−1 10	17	1 36.0	1 13
22	2 6.4	3 55	17	2 10.9	1 10	21	1 32.1	1 24
26	2 2.4	3 55	21	2 12.2	1 9	25	1 28.1	1 34
Mar. 2	1 58.0	3 54	25	2 13.3	1 8	29	1 24.0	1 44
6	1 53.3	3 52	29	2 14.0	1 7	Dec. 3	1 19.7	1 54
10	1 48.2	3 49	Sept. 2	2 14.5	1 5	7	1 15.4	2 4
14	1 42.8	3 44	6	2 14.6	1 3	11	1 10.9	2 13
18	1 37.0	3 39	10	2 14.5	1 0	15	1 6.3	2 22
22	1 31.0	3 33	14	2 14.1	0 57	19	1 1.7	2 30
26	1 24.6	3 26	18	2 13.4	0 53	23	0 56.9	2 38
30	1 18.0	3 19	22	2 12.4	0 48	27	0 52.1	2 45
Apr. 3	−1 11.2	−3 11	26	+2 11.2	−0 42	31	+0 47.1	+2 51

FRACTIONS OF THE PERIODS OF REVOLUTION.

tion of a olution.	Mimas.	Enceladus.		Tethys.		Dione.		Rhea.		Titan.		Fraction of a Revolution.
	h	d	h	d	h	d	h	d	h	d	h	
0.00	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.00
0.02	0.5	0	0.7	0	0.9	0	1.3	0	2.2	0	7.7	0.02
0.04	0.9	0	1.3	0	1.8	0	2.6	0	4.3	0	15.3	0.04
0.06	1.4	0	2.0	0	2.7	0	3.9	0	6.5	0	23.0	0.06
0.08	1.8	0	2.6	0	3.6	0	5.3	0	8.7	1	6.6	0.08
0.10	2.3	0	3.3	0	4.5	0	6.6	0	10.8	1	14.3	0.10
0.12	2.7	0	4.0	0	5.4	0	7.9	0	13.0	1	21.9	0.12
0.14	3.2	0	4.6	0	6.3	0	9.2	0	15.2	2	5.6	0.14
0.16	3.6	0	5.3	0	7.2	0	10.5	0	17.3	2	13.2	0.16
0.18	4.1	0	5.9	0	8.2	0	11.8	0	19.5	2	20.9	0.18
0.20	4.5	0	6.6	0	9.1	0	13.1	0	21.7	3	4.5	0.20
0.22	5.0	0	7.2	0	10.0	0	14.5	0	23.9	3	12.2	0.22
0.24	5.4	0	7.9	0	10.9	0	15.8	1	2.0	3	19.8	0.24
0.26	5.9	0	8.6	0	11.8	0	17.1	1	4.2	4	3.5	0.26
0.28	6.3	0	9.2	0	12.7	0	18.4	1	6.4	4	11.2	0.28
0.30	6.8	0	9.9	0	13.6	0	19.7	1	8.5	4	18.8	0.30
0.32	7.2	0	10.5	0	14.5	0	21.0	1	10.7	5	2.5	0.32
0.34	7.7	0	11.2	0	15.4	0	22.3	1	12.9	5	10.1	0.34
0.36	8.1	0	11.8	0	16.3	0	23.6	1	15.0	5	17.8	0.36
0.38	8.6	0	12.5	0	17.2	1	1.0	1	17.2	6	1.4	0.38
0.40	9.0	0	13.2	0	18.1	1	2.3	1	19.4	6	9.1	0.40
0.42	9.5	0	13.8	0	19.0	1	3.6	1	21.5	6	16.7	0.42
0.44	10.0	0	14.5	0	19.9	1	4.9	1	23.7	7	0.4	0.44
0.46	10.4	0	15.1	0	20.8	1	6.2	2	1.9	7	8.0	0.46
0.48	10.9	0	15.8	0	21.7	1	7.5	2	4.0	7	15.7	0.48
0.50	11.3	0	16.4	0	22.7	1	8.8	2	6.2	7	23.3	0.50
0.52	11.8	0	17.1	0	23.6	1	10.2	2	8.4	8	7.0	0.52
0.54	12.2	0	17.8	1	0.5	1	11.5	2	10.5	8	14.7	0.54
0.56	12.7	0	18.4	1	1.4	1	12.8	2	12.7	8	22.3	0.56
0.58	13.1	0	19.1	1	2.3	1	14.1	2	14.9	9	6.0	0.58
0.60	13.6	0	19.7	1	3.2	1	15.4	2	17.1	9	13.6	0.60
0.62	14.0	0	20.4	1	4.1	1	16.7	2	19.2	9	21.3	0.62
0.64	14.5	0	21.0	1	5.0	1	18.0	2	21.4	10	4.9	0.64
0.66	14.9	0	21.7	1	5.9	1	19.4	2	23.6	10	12.6	0.66
0.68	15.4	0	22.4	1	6.8	1	20.7	3	1.7	10	20.2	0.68
0.70	15.8	0	23.0	1	7.7	1	22.0	3	3.9	11	3.9	0.70
0.72	16.3	0	23.7	1	8.6	1	23.3	3	6.1	11	11.5	0.72
0.74	16.7	1	0.3	1	9.5	2	0.6	3	8.2	11	19.2	0.74
0.76	17.2	1	1.0	1	10.4	2	1.9	3	10.4	12	2.8	0.76
0.78	17.6	1	1.7	1	11.3	2	3.2	3	12.6	12	10.5	0.78
0.80	18.1	1	2.3	1	12.2	2	4.5	3	14.7	12	18.2	0.80
0.82	18.5	1	3.0	1	13.2	2	5.9	3	16.9	13	1.8	0.82
0.84	19.0	1	3.6	1	14.1	2	7.2	3	19.1	13	9.5	0.84
0.86	19.5	1	4.3	1	15.0	2	8.5	3	21.2	13	17.1	0.86
0.88	19.9	1	4.9	1	15.9	2	9.8	3	23.4	14	0.8	0.88
0.90	20.4	1	5.6	1	16.8	2	11.1	4	1.6	14	8.4	0.90
0.92	20.8	1	6.3	1	17.7	2	12.4	4	3.7	14	16.1	0.92
0.94	21.3	1	6.9	1	18.6	2	13.7	4	5.9	14	23.7	0.94
0.96	21.7	1	7.6	1	19.5	2	15.1	4	8.1	15	7.4	0.96
0.98	22.2	1	8.2	1	20.4	2	16.4	4	10.3	15	15.0	0.98
1.00	22.6	1	8.9	1	21.3	2	17.7	4	12.4	15	22.7	1.00

Six Inner Satellites of Saturn.			Hyperion.			Iapetus.		
Fraction of a Revolution.	p^1	F	Time from Eastern Elongation.	p^1	F	Time from Eastern Elongation.	p^1	F
	°		d	°		d	°	
0.00	83.3	1.000	0.0	81.6	0.953	0	81.2	1.028
0.02	80.3	0.993	0.5	77.7	0.944	2	79.6	1.016
0.04	77.3	0.974	1.0	73.6	0.916	4	77.9	0.982
0.06	74.0	0.942	1.5	69.3	0.873	6	76.1	0.926
0.08	70.5	0.899	2.0	64.3	0.816	8	73.9	0.848
0.10	66.6	0.845	2.5	58.5	0.750	10	71.3	0.753
0.12	62.1	0.782	3.0	51.6	0.677	12	67.8	0.641
0.14	56.7	0.713	3.5	42.9	0.603	14	62.8	0.517
0.16	50.2	0.640	4.0	31.9	0.535	16	54.4	0.388
0.18	42.0	0.567	4.5	18.1	0.482	18	37.8	0.264
0.20	31.5	0.501	5.0	1.8	0.454	20	1.6	0.187
0.22	18.1	0.448	5.5	344.6	0.458	22	316.5	0.221
0.24	2.0	0.418	6.0	328.8	0.494	24	293.0	0.331
0.26	344.7	0.418	6.5	315.7	0.552	26	281.9	0.460
0.28	328.6	0.448	7.0	305.4	0.624	28	275.7	0.586
0.30	315.2	0.501	7.5	297.3	0.701	30	271.6	0.701
0.32	304.7	0.567	8.0	290.8	0.777	32	268.6	0.800
0.34	296.5	0.640	8.5	285.5	0.849	34	266.2	0.878
0.36	289.9	0.713	9.0	280.9	0.912	36	264.2	0.934
0.38	284.6	0.782	9.5	276.9	0.965	38	262.4	0.966
0.40	280.1	0.845	10.0	273.3	1.006	40	260.6	0.972
0.42	276.2	0.899	10.5	269.8	1.031	42	258.8	0.952
0.44	272.7	0.942	11.0	266.5	1.042	44	256.8	0.908
0.46	269.4	0.974	11.5	263.3	1.036	46	254.6	0.841
0.48	266.3	0.993	12.0	260.0	1.014	48	252.0	0.753
0.50	263.3	1.000	12.5	256.4	0.976	50	248.5	0.647
0.52	260.3	0.993	13.0	252.4	0.921	52	243.6	0.527
0.54	257.3	0.974	13.5	247.9	0.851	54	235.6	0.400
0.56	254.0	0.942	14.0	242.5	0.768	56	220.5	0.279
0.58	250.5	0.899	14.5	235.7	0.676	58	187.7	0.194
0.60	246.6	0.845	15.0	226.7	0.580	60	142.6	0.212
0.62	242.1	0.782	15.5	214.1	0.489	62	116.6	0.314
0.64	236.7	0.713	16.0	196.7	0.419	64	104.3	0.440
0.66	230.2	0.640	16.5	174.6	0.390	66	97.6	0.566
0.68	222.0	0.567	17.0	152.0	0.411	68	93.2	0.684
0.70	211.5	0.501	17.5	133.7	0.475	70	90.1	0.789
0.72	198.1	0.448	18.0	120.4	0.562	72	87.7	0.878
0.74	182.0	0.418	18.5	110.8	0.655	74	85.7	0.947
0.76	164.7	0.418	19.0	103.5	0.743	76	83.9	0.996
0.78	148.6	0.448	19.5	97.7	0.820	78	82.3	1.022
0.80	135.2	0.501	20.0	92.8	0.881	80	80.7	1.026
0.82	124.7	0.567	20.5	88.5	0.924			
0.84	116.5	0.640	21.0	84.5	0.948			
0.86	100.9	0.713	21.5	80.6	0.953			
0.88	104.6	0.782						
0.90	100.1	0.845						
0.92	96.2	0.899						
0.94	92.7	0.942						
0.96	89.4	0.974						
0.98	86.3	0.993						
1.00	83.3	1.000						

The fraction of a revolution is reckoned from the Eastern Elongation.
Position angle of satellite $p = p^1 + (P - P_0)$.
Apparent distance of satellite $s = F \frac{a(\rho)}{\rho}$.

Date.	Mimas.		Enceladus.		Tethys.		Dione.	
	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$
	°	″	°	″	°	″	°	″
Jan. 0	+0.3	31.8	+0.7	40.8	−0.1	50.5	+0.7	64.7
10	0.7	31.6	0.8	40.6	0.0	50.2	0.8	64.3
20	1.0	31.3	0.8	40.2	0.0	49.7	0.9	63.7
30	1.4	30.9	0.9	39.7	+0.1	49.1	0.9	62.9
Feb. 9	1.7	30.4	0.9	39.1	0.2	48.3	1.0	62.0
19	+2.0	29.9	+1.0	38.4	+0.2	47.5	+1.0	60.9
Mar. 1	2.2	29.4	0.9	37.7	0.2	46.7	1.0	59.8
11	2.4	28.8	0.9	37.0	0.3	45.8	0.9	58.7
21	2.5	28.3	0.9	36.4	0.3	45.0	0.9	57.6
31	2.6	27.8	0.8	35.7	0.3	44.2	0.9	56.6
Apr. 10	+2.6	27.3	+0.8	35.1	+0.3	43.4	+0.8	55.7
Sept. 17	−2.1	27.4	−0.3	35.2	+0.1	43.5	−0.4	55.8
27	−2.2	27.9	−0.4	35.8	+0.1	44.3	−0.4	56.7
Oct. 7	2.1	28.4	0.4	36.4	0.2	45.1	0.4	57.8
17	2.0	28.9	0.4	37.1	0.2	45.9	0.5	58.9
27	1.8	29.4	0.4	37.8	0.2	46.8	0.5	59.9
Nov. 6	1.6	30.0	0.4	38.5	0.3	47.6	0.5	61.0
16	−1.3	30.5	−0.4	39.1	+0.3	48.4	−0.5	62.0
26	1.1	30.9	0.4	39.7	0.3	49.1	0.4	63.0
Dec. 6	0.8	31.3	0.4	40.2	0.4	49.7	0.4	63.7
16	0.5	31.6	0.4	40.6	0.4	50.2	0.4	64.3
26	−0.2	31.7	−0.3	40.8	+0.5	50.4	−0.4	64.6

Date.	Rhea.		Titan.		Hyperion.		Iapetus.	
	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$	$P-P_0$	$\frac{a(\rho)}{\rho}$
	°	″	°	″	°	″	°	″
Jan. 0	+1.1	90.4	+0.9	209	+1.0	253	−3.0	610
10	1.1	89.8	1.0	208	1.1	252	3.2	606
20	1.2	89.0	1.0	206	1.2	250	3.3	601
30	1.3	87.9	1.1	204	1.2	247	3.4	593
Feb. 9	1.3	86.5	1.1	201	1.2	243	3.4	584
19	+1.3	85.1	+1.1	197	+1.3	239	−3.5	574
Mar. 1	1.3	83.6	1.1	194	1.3	235	3.5	564
11	1.3	82.0	1.1	190	1.2	230	3.4	554
21	1.3	80.5	1.1	187	1.2	226	3.4	544
31	1.2	79.1	1.0	183	1.2	222	3.3	534
Apr. 10	+1.2	77.7	+1.0	180	+1.1	218	−3.2	525
Sept. 17	−0.1	77.9	−0.1	181	−0.1	219	+0.4	526
27	−0.1	79.3	−0.1	184	−0.1	222	+0.6	535
Oct. 7	0.1	80.7	0.1	187	0.1	226	0.7	545
17	0.1	82.2	0.1	190	0.1	231	0.8	555
27	0.1	83.7	0.1	194	0.1	235	0.8	565
Nov. 6	0.1	85.2	0.1	198	0.1	239	0.8	575
16	−0.1	86.7	−0.1	201	−0.1	243	+0.7	585
26	0.1	87.9	0.1	204	0.1	247	0.6	594
Dec. 6	0.1	89.0	0.1	206	0.1	250	0.5	601
16	−0.1	89.8	−0.1	208	−0.1	252	0.4	606
26	0.0	90.3	0.0	209	0.0	253	+0.2	610

Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$				Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$			
		Ariel.	Umbriel.	Titania.	Oberon.			Ariel.	Umbriel.	Titania.	Oberon.
	°	″	″	″	″		°	″	″	″	″
Apr. 9	−0.5	13.0	18.2	29.7	39.7	Aug. 7	0.0	13.9	19.6	31.9	42.7
14	0.6	13.0	18.3	29.8	39.9	12	+0.1	13.9	19.6	31.9	42.7
19	0.6	13.1	18.4	29.9	40.0	17	0.2	13.9	19.6	31.9	42.7
24	0.7	13.1	18.5	30.1	40.2	22	0.2	13.9	19.6	31.9	42.6
29	0.7	13.2	18.5	30.2	40.4	27	0.3	13.9	19.5	31.8	42.6
May 4	−0.8	13.2	18.6	30.3	40.5	Sept. 1	+0.4	13.9	19.5	31.8	42.5
9	0.8	13.3	18.7	30.4	40.7	6	0.4	13.8	19.5	31.7	42.4
14	0.8	13.3	18.8	30.6	40.9	11	0.5	13.8	19.4	31.6	42.3
19	0.8	13.4	18.8	30.7	41.0	16	0.6	13.8	19.4	31.5	42.2
24	0.8	13.4	18.9	30.8	41.2	21	0.6	13.7	19.3	31.5	42.0
29	−0.8	13.5	19.0	31.0	41.4	26	+0.7	13.7	19.2	31.4	41.9
June 3	0.8	13.6	19.1	31.1	41.5	Oct. 1	0.7	13.6	19.2	31.2	41.8
8	0.7	13.6	19.1	31.2	41.7	6	0.7	13.6	19.1	31.1	41.6
13	0.7	13.6	19.2	31.3	41.9	11	0.8	13.5	19.0	31.0	41.4
18	0.7	13.7	19.3	31.4	42.0	16	0.8	13.5	18.9	30.9	41.3
23	−0.6	13.7	19.3	31.5	42.1	21	+0.8	13.4	18.9	30.7	41.1
28	0.6	13.8	19.4	31.6	42.2	26	0.8	13.3	18.8	30.6	40.9
July 3	0.5	13.8	19.4	31.7	42.4	31	0.8	13.3	18.7	30.5	40.7
8	0.4	13.8	19.5	31.7	42.5	Nov. 5	0.8	13.2	18.6	30.3	40.6
13	0.4	13.9	19.5	31.8	42.5	10	0.7	13.2	18.5	30.2	40.4
18	−0.3	13.9	19.6	31.9	42.6	15	+0.7	13.1	18.5	30.1	40.2
23	0.2	13.9	19.6	31.9	42.7	20	0.6	13.1	18.4	30.0	40.1
28	0.2	13.9	19.6	31.9	42.7	25	0.6	13.0	18.3	29.8	39.9
Aug. 2	−0.1	13.9	19.6	32.0	42.7	30	+0.5	13.0	18.2	29.7	39.7

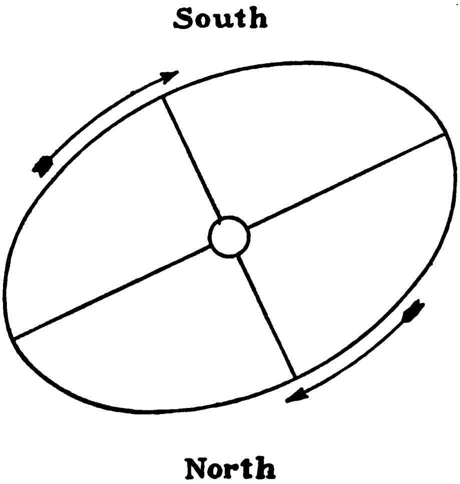
SATELLITE OF NEPTUNE, 1915.

Time from Eastern Elongation.	p^1	F	Time from Eastern Elongation.	p^1	F	Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$	Date.	$P-P_0$	$\frac{a(\rho)}{\rho}$
d h	°		d h	°			°	″		°	″
0 0	115.2	1.000	3 0	292.7	0.999	Jan. 0	+0.6	16.8	Apr. 30	−1.6	16.2
0 3	110.2	0.995	3 3	287.8	0.988	5	0.5	16.8	May 5	1.5	16.2
0 6	105.2	0.979	3 6	282.6	0.968	10	0.3	16.9	10	1.4	16.1
0 9	99.9	0.954	3 9	277.2	0.939	15	+0.2	16.9	15	−1.3	16.1
0 12	94.3	0.921	3 12	271.4	0.902	20	0.0	16.9	Sept. 27	+3.6	16.1
0 15	88.2	0.881	3 15	265.0	0.859	25	−0.2	16.9	Oct. 2	+3.7	16.1
0 18	81.5	0.836	3 18	257.9	0.812	30	0.4	16.8	7	3.8	16.1
0 21	74.0	0.788	3 21	250.0	0.765	Feb. 4	0.5	16.8	12	3.9	16.2
1 0	65.5	0.742	4 0	241.0	0.721	9	0.7	16.8	17	4.0	16.2
1 3	56.0	0.701	4 3	231.0	0.684	14	0.8	16.8	22	4.0	16.3
1 6	45.5	0.669	4 6	220.0	0.658	19	−1.0	16.8	27	+4.1	16.3
1 9	34.1	0.649	4 9	208.3	0.645	24	1.1	16.7	Nov. 1	4.1	16.4
1 12	22.2	0.645	4 12	196.4	0.649	Mar. 1	1.2	16.7	6	4.1	16.4
1 15	10.6	0.657	4 15	185.0	0.669	6	1.3	16.7	11	4.1	16.5
1 18	359.5	0.683	4 18	174.4	0.701	11	1.4	16.6	16	4.1	16.5
1 21	349.5	0.721	4 21	164.9	0.742	16	−1.5	16.6	21	+4.0	16.5
2 0	340.5	0.765	5 0	156.5	0.788	21	1.6	16.6	26	4.0	16.6
2 3	332.6	0.812	5 3	149.0	0.835	26	1.6	16.5	Dec. 1	3.9	16.6
2 6	325.5	0.858	5 6	142.3	0.880	31	1.7	16.5	6	3.8	16.7
2 9	319.1	0.901	5 9	136.2	0.921	Apr. 5	1.7	16.4	11	3.7	16.7
2 12	313.3	0.939	5 12	130.5	0.954	10	−1.7	16.4	16	+3.6	16.7
2 15	307.8	0.968	5 15	125.3	0.979	15	1.7	16.3	21	3.5	16.8
2 18	302.7	0.988	5 18	120.2	0.995	20	1.7	16.3	26	3.3	16.8
2 21	297.7	0.999	5 21	115.3	1.000	25	−1.6	16.2	31	+3.2	16.8

Position angle of satellite $p = p^1 + (P - P_0)$.

Apparent distance of satellite $s = F\frac{a(\rho)}{\rho}$.

APPARENT ORBIT OF THE SATELLITE OF NEPTUNE AT DATE OF OPPOSITION, JANUARY 19, 1915, AS SEEN IN AN INVERTING TELESCOPE.



Date.	Position Angle of Apsis.	Apparent Distance at Apsis.
	°	″
Jan. 20	115.2	16.8
Apr. 10	113.5	16.3
Oct. 7	119.0	16.1
Dec. 26	118.5	16.7

WASHINGTON MEAN TIME OF GREATEST ELONGATION.

East.			West.			East.			West.			East.			West.		
	d	h		d	h		d	h		d	h		d	h		d	h
Jan.	4	3.8	Jan.	7	2.3	Mar.	27	11.4	Mar.	30	9.9	Oct.	13	4.6	Oct.	16	3.1
	10	0.9		12	23.5	Apr.	2	8.5	Apr.	5	7.0		19	1.6		22	0.1
	15	22.0		18	20.6		8	5.5		11	4.0		24	22.6		27	21.1
	21	19.2		24	17.7		14	2.6		17	1.1		30	19.6	Nov.	2	18.1
	27	16.3		30	14.8		19	23.6		22	22.1	Nov.	5	16.6		8	15.1
Feb.	2	13.4	Feb.	5	12.0		25	20.6		28	19.2		11	13.7		14	12.2
	8	10.5		11	9.1	May	1	17.7	May	4	16.2		17	10.7		20	9.2
	14	7.6		17	6.2		7	14.7		10	13.2		23	7.8		26	6.3
	20	4.8		23	3.3		13	11.7		16	10.2		29	4.8	Dec.	2	3.4
	26	1.9	Mar.	1	0.4		19	8.7		22	7.2	Dec.	5	1.9		8	0.4
Mar.	3	23.0		6	21.6		. . . . .			. . . . .			10	23.0		13	21.5
	9	20.1		12	18.7	Sept.	25	13.6	Sept.	28	12.1		16	20.1		19	18.6
	15	17.2		18	15.8	Oct.	1	10.6	Oct.	4	9.1		22	17.2		25	15.7
	21	14.3		24	12.8		7	7.6		10	6.1		28	14.3		31	12.8

The above times are the instants of each passage of the satellite through the apsis of its apparent orbit. The position of the satellite at any other time may be found by measuring around the orbit from the apsis last passed through, bearing in mind that the radius vector of the satellite describes equal areas in equal times.

The sidereal period of the satellite of Neptune is $5^{d}\ 21^{h}.044$.

NOTE.—In the preceding diagrams the central circle represents the planet and is on the same scale as the orbits.

WASHINGTON MEAN TIME.

PLANETARY CONFIGURATIONS.

	d	h	m				°	′
Jan.	1	2	–	☌ ☿ ♂		☿ −	0	48
	1	19	–	♀	Greatest brilliancy.			
	2	1	–	⊕	in Perihelion.			
	2	7	5	☌ ♆ ☾		♆ −	2	53
	4	23	–	☌ ☿ ☉	Superior.			
	6	14	–	♀	in Perihelion.			
	11	18	13	☌ ♀ ☾		♀ +	9	42
	14	10	44	☌ ♂ ☾		♂ +	2	23
	15	6	–	☿	Greatest Hel. Lat. S.			
	15	9	49	☌ ☿ ☾		☿ +	0	7
	16	1	18	☌ ♅ ☾		♅ +	0	52
	17	5	29	☌ ♃ ☾		♃ −	0	54
	19	12	–	☍ ♆ ☉				
	20	17	–	☌ ☿ ♅		☿ −	1	20
	27	0	51	☌ ♄ ☾		♄ −	5	37
	28	12	–	♀	Greatest Hel. Lat. N.			
	29	13	26	☌ ♆ ☾		♆ −	2	56
	31	21	–	☌ ♅ ☉				
Feb.	1	14	–	☌ ☿ ♃		☿ +	0	33
	3	6	–	☿	in ☊			
	5	13	–	☿	Great. elong. E.		18	14
	6	1	–	♀	Great. elong. W.		46	54
	7	21	–	☿	in Perihelion.			
	9	18	34	☌ ♀ ☾		♀ +	7	30
	11	11	–	☿	Stationary.			
	12	10	57	☌ ♂ ☾		♂ +	0	24
	12	13	21	☌ ♅ ☾		♅ +	0	43
	13	–	–	☉	Ann. ecl. invis. at W.			
	14	3	19	☌ ♃ ☾		♃ −	1	37
	14	7	–	☌ ♂ ♅		♂ −	0	27
	14	10	7	☌ ☿ ☾		☿ +	2	4
	17	23	–	☌ ☿ ♃		☿ +	4	44
	18	4	–	☿	Greatest Hel. Lat. N.			
	20	19	–	♄	in Perihelion.			
	21	1	–	☌ ☿ ☉	Inferior.			
	23	8	6	☌ ♄ ☾		♄ −	5	35
	23	22	–	☌ ♃ ☉				
	25	12	–	♄	Stationary.			
	25	21	25	☌ ♆ ☾		♆ −	3	0
	28	14	–	☌ ☿ ♂		☿ +	4	14
Mar.	5	7	–	☿	Stationary.			
	11	8	24	☌ ♀ ☾		♀ +	3	0
	11	9	–	♂	Greatest Hel. Lat. S.			
	11	23	7	☌ ♅ ☾		♅ +	0	33
	12	20	36	☌ ☿ ☾		☿ +	0	16
	13	13	24	☌ ♂ ☾		♂ −	1	59
	13	15	–	☿	in ☋			
	14	0	5	☌ ♃ ☾		♃ −	2	20
	16	16	–	□ ♄ ☉				
	18	13	–	☌ ♀ ♅		♀ +	1	10
	19	22	–	☿	Great. elong. W.		27	44

	d	h	m				°	′
Mar.	20	23	43	☉	enters ♈, Spring com.			
	22	17	30	☌ ♄ ☾		♄ −	5	22
	23	8	–	☌ ♂ ♃		♂ −	0	12
	23	20	–	☿	in Aphelion.			
	25	6	4	☌ ♆ ☾		♆ −	2	55
	25	14	–	♀	in ☋			
	29	8	–	☌ ☿ ♃		☿ −	1	18
Apr.	3	9	–	☌ ☿ ♂		☿ −	1	25
	4	23	–	♂	in Perihelion.			
	8	6	52	☌ ♅ ☾		♅ +	0	18
	8	7	–	♆	Stationary.			
	10	9	58	☌ ♀ ☾		♀ −	2	36
	10	19	1	☌ ♃ ☾		♃ −	3	6
	11	16	56	☌ ♂ ☾		♂ −	4	12
	12	8	40	☌ ☿ ☾		☿ −	6	14
	13	5	–	☿	Greatest Hel. Lat. S.			
	14	23	–	☌ ♀ ♃		♀ −	0	9
	18	3	–	□ ♆ ☉				
	19	4	15	☌ ♄ ☾		♄ −	5	0
	21	14	17	☌ ♆ ☾		♆ −	2	41
	28	20	–	♀	in Aphelion.			
May	1	1	–	☌ ☿ ☉	Superior.			
	2	5	–	☿	in ☊			
	5	14	0	☌ ♅ ☾		♅ −	0	2
	6	12	–	□ ♅ ☉				
	6	20	–	☿	in Perihelion.			
	8	12	1	☌ ♃ ☾		♃ −	3	54
	10	16	49	☌ ♀ ☾		♀ −	6	28
	10	19	46	☌ ♂ ☾		♂ −	5	38
	13	20	–	☌ ♀ ♂		♀ −	0	56
	14	21	18	☌ ☿ ☾		☿ −	2	51
	16	15	52	☌ ♄ ☾		♄ −	4	36
	17	3	–	☿	Greatest Hel. Lat. N.			
	18	21	43	☌ ♆ ☾		♆ −	2	23
	21	0	–	♅	Stationary.			
	21	10	–	♀	Greatest Hel. Lat. S.			
	30	21	–	☌ ☿ ♄		☿ +	2	29
	31	4	–	☿	Great. elong. E.		23	18
June	1	21	47	☌ ♅ ☾		♅ −	0	20
	5	3	0	☌ ♃ ☾		♃ −	4	38
	8	20	47	☌ ♂ ☾		♂ −	6	1
	9	14	–	☿	in ☋			
	9	22	9	☌ ♀ ☾		♀ −	6	38
	13	4	14	☌ ♄ ☾		♄ −	4	16
	13	11	–	☿	Stationary.			
	13	14	34	☌ ☿ ☾		☿ −	4	18
	15	4	54	☌ ♆ ☾		♆ −	2	8
	18	18	–	□ ♃ ☉				
	19	20	–	☿	in Aphelion.			
	21	19	21	☉	enters ♋, Summer com.			
	24	14	–	☌ ☿ ♄		☿ −	3	14

WASHINGTON MEAN TIME.

PLANETARY CONFIGURATIONS.

	d	h	m					°	′
June	26	12	–	☌ ☿ ☉	Inferior.				
	28	0	–	☌ ♄ ☉					
	29	6	22	☌ ♅ ☾		♅	—	0	28
July	2	15	34	☌ ♃ ☾		♃	—	5	12
	5	4	–	⊕	in Aphelion.				
	7	19	52	☌ ♂ ☾		♂	—	5	30
	7	20	–	☿	Stationary.				
	10	3	5	☌ ♀ ☾		♀	—	4	7
	10	3	42	☌ ☿ ☾		☿	—	7	57
	10	4	–	☿	Greatest Hel. Lat. S.				
	10	11	–	☌ ☿ ♀		☿	—	3	50
	10	17	25	☌ ♄ ☾		♄	—	4	0
	12	12	43	☌ ♆ ☾		♆	—	1	59
	16	17	–	♀	in ☊				
	16	20	–	☌ ♀ ♄		♀	+	0	38
	18	10	–	☿	Great. elong. W.			20	23
	19	9	–	♃	Stationary.				
	22	2	–	☌ ☿ ♄		☿	—	1	0
	23	11	–	☌ ♆ ☉					
	26	14	53	☌ ♅ ☾		♅	—	0	27
	29	5	–	☿	in ☊				
	30	0	52	☌ ♃ ☾		♃	—	5	29
Aug.	2	19	–	☿	in Perihelion.				
	3	19	–	☌ ☿ ♀		☿	+	0	18
	3	19	–	☌ ☿ ♆		☿	+	1	21
	3	20	–	☌ ♀ ♆		♀	+	1	3
	5	17	–	♂	in ☊				
	5	17	30	☌ ♂ ☾		♂	—	4	22
	6	14	–	☍ ♅ ☉					
	7	7	15	☌ ♄ ☾		♄	—	3	47
	8	21	41	☌ ♆ ☾		♆	—	1	54
	9	10	58	☌ ♀ ☾		♀	—	0	2
	9	22	6	☌ ☿ ☾		☿	+	1	18
	10	–	–	☉	Ann. Ecl. invis. at W.				
	13	2	–	☿	Greatest Hel. Lat. N.				
	13	17	–	☌ ☿ ☉	Superior.				
	19	6	–	♀	in Perihelion.				
	22	22	18	☌ ♅ ☾		♅	—	0	20
	26	6	14	☌ ♃ ☾		♃	—	5	27
Sept.	3	13	55	☌ ♂ ☾		♂	—	2	45
	3	20	58	☌ ♄ ☾		♄	—	3	31
	5	7	46	☌ ♆ ☾		♆	—	1	48
	5	13	–	☿	in ☋				
	8	19	15	☌ ♀ ☾		♀	+	4	19
	10	5	–	♀	Greatest Hel. Lat. N.				
	10	6	–	☌ ♂ ♄		♂	+	1	8
	10	12	43	☌ ☿ ☾		☿	+	3	50
	12	1	–	☌ ♀ ☉	Superior.				
	15	19	–	☿	in Aphelion.				
	16	19	–	☍ ♃ ☉					
	19	4	3	☌ ♅ ☾		♅	—	0	18
	22	8	15	☌ ♃ ☾		♃	—	5	11

	d	h	m					°	′
Sept.	23	10	16	☉	enters ♎, Autumn com.				
	27	12	–	☿	Great. elong. E.			26	2
Oct.	1	9	15	☌ ♄ ☾		♄	—	3	13
	2	8	32	☌ ♂ ☾		♂	—	0	43
	2	17	59	☌ ♆ ☾		♆	—	1	36
	6	4	–	☿	Greatest Hel. Lat. S.				
	8	21	22	☌ ♀ ☾		♀	+	6	10
	9	18	32	☌ ☿ ☾		☿	+	1	41
	9	20	–	□ ♄ ☉					
	10	3	–	☿	Stationary.				
	11	2	–	☌ ♂ ♆		♂	+	1	28
	16	9	0	☌ ♅ ☾		♅	—	0	26
	17	0	–	☌ ☿ ♀		☿	—	3	30
	19	9	16	☌ ♃ ☾		♃	—	4	57
	21	21	–	☌ ☿ ☉	Inferior.				
	22	4	–	♅	Stationary.				
	25	4	–	☿	in ☊				
	26	10	–	□ ♆ ☉					
	28	18	32	☌ ♄ ☾		♄	—	2	53
	29	7	–	♄	Stationary.				
	29	19	–	☿	in Perihelion.				
	30	3	1	☌ ♆ ☾		♆	—	1	18
	30	9	–	☿	Stationary.				
	30	23	29	☌ ♂ ☾		♂	+	1	34
Nov.	4	15	–	□ ♅ ☉					
	5	6	–	♀	in ☋				
	5	7	–	♆	Stationary.				
	5	11	6	☌ ☿ ☾		☿	+	7	31
	6	17	–	☿	Great. elong. W.			18	57
	7	17	28	☌ ♀ ☾		♀	+	4	46
	9	1	–	☿	Great. Hel. Lat. N.				
	9	10	–	□ ♂ ☉					
	12	15	12	☌ ♅ ☾		♅	—	0	43
	14	15	–	♃	Stationary.				
	15	12	46	☌ ♃ ☾		♃	—	4	59
	25	0	0	☌ ♄ ☾		♄	—	2	41
	26	9	54	☌ ♆ ☾		♆	—	1	3
	28	7	9	☌ ♂ ☾		♂	+	3	52
Dec.	2	12	–	☿	in ☋				
	5	17	8	☌ ☿ ☾		☿	+	4	9
	7	13	28	☌ ♀ ☾		♀	+	1	31
	9	12	–	♀	in Aphelion.				
	10	0	34	☌ ♅ ☾		♅	—	1	2
	12	8	–	□ ♃ ☉					
	12	18	–	☿	in Aphelion.				
	12	21	35	☌ ♃ ☾		♃	—	5	14
	15	7	–	☌ ☿ ☉	Superior.				
	22	2	34	☌ ♄ ☾		♄	—	2	41
	22	5	8	☉	enters ♑, Winter com.				
	23	14	58	☌ ♆ ☾		♆	—	0	56
	26	2	1	☌ ♂ ☾		♂	+	5	45

No.	Place.	Geographic Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Washington.
		° ′ ″	′ ″			h m s
1	Abbadia, France .	+43 22 52.2	−11 34.4	69	9.999 317	− 5 1 15.7
2	Adelaide	−34 55 38	+10 52.4	43	9.999 526	+ 9 37 23.92
3	Albany, N. Y . .	+42 39 12.7	−11 33.1	67	9.999 336	− 0 13 9.0
4	Algiers	+36 47 50	−11 6.7	342	9.999 501	− 5 20 24.33
5	Allegheny, Pa . .	+40 28 58.0	−11 26.7	384	9.999 412	+ 0 11 49.61
6	Amherst, Mass. .	+42 21 56.5	−11 32.5	110	9.999 346	− 0 18 9.85
7	Ann Arbor, Mich. .	+42 16 48.0	−11 32.3	285	9.999 360	+ 0 26 39.41
8	Appleton, Wis. .	+44 15 39	−11 35.4	238	9.999 306	+ 0 45 20.11
9	Arcetri, Italy . .	+43 45 14.6	−11 34.9	184	9.999 316	− 5 53 17.12
10	Arequipa, Peru .	−16 22 28.0	+ 6 15.2	2452	0.000 052	− 0 22 4.05
11	Armagh, Ireland .	+54 21 12.7	−10 59.6	61	9.999 040	− 4 41 40.4
12	Athens	+37 58 19.7	−11 14.3	107	9.999 456	− 6 43 8.70
13	Baltimore, Md. .	+39 17 48	−11 21.5	75	9.999 421	− 0 1 49.8
14	Bamberg, Bavaria	+49 53 6.0	−11 26.0	300	9.999 167	− 5 51 49.43
15	Barcelona, Spain .	+41 25 18	−11 30.0	420	9.999 391	− 5 16 43.8
16	Bayswater . . .	−31 55 13	+10 23.5	30	9.999 596	+11 8 6
17	Beloit, Wis. . . .	+42 30 8.4	−11 32.8	. . .	9.999 335	+ 0 47 51.5
18	Bergen, Norway .	+60 23 54	− 9 58.6	. . .	9.998 895	− 5 29 28.53
19	Berkeley, Cal. . .	+37 52 23.6	−11 13.7	97	9.999 458	+ 3 0 46.94
20	Berlin, Prussia . .	+52 30 16.7	−11 12.5	47	9.999 085	− 6 1 50.63
21	Berlin, Prussia . .	+52 31 30.7	−11 12.4	. . .	9.999 081	− 6 1 43.23
22	Berlin, Prussia . .	+52 29 7	−11 12.6	38	9.999 084	− 6 2 10.0
23	Berne, Switzerland	+46 57 8.7	−11 34.2	573	9.999 260	− 5 38 1.51
24	Besançon, France .	+47 14 59.0	−11 33.7	310	9.999 235	− 5 32 12.95
25	Bethlehem, Pa. .	+40 36 23.1	−11 27.2	. . .	9.999 383	− 0 6 43.93
26	Birr Castle, Ireland	+53 5 47.0	−11 8.7	56	9.999 071	− 4 36 34.9
27	Bloomington, Ind.	+39 9 54	−11 20.8	266	9.999 437	+ 0 38 38
28	Bogota	+ 4 36 15.4	− 1 51.0	2634	0.000 170	− 0 11 21.58
29	Bombay, India .	+18 53 45	− 7 5.2	19	9.999 849	− 9 59 31.52
30	Bonn, Prussia . .	+50 43 45.0	−11 22.3	62	9.999 130	− 5 36 39.00
31	Bordeaux, France	+44 50 7.2	−11 35.6	73	9.999 281	− 5 6 10.24
32	Boston, Mass. . .	+42 20 58	−11 32.5	. . .	9.999 339	− 0 23 56.7
33	Bothkamp, Prussia	+54 12 9.6	−11 0.8	32	9.999 042	− 5 48 47.0
34	Bremen, Germany	+53 4 36	−11 8.8	. . .	9.999 067	− 5 43 31.7
35	Breslau, Prussia .	+51 6 55.8	−11 20.4	147	9.999 126	− 6 16 24.57
36	Brisbane	−27 28 0	+ 9 28.3	. . .	9.999 691	+ 8 39 37.8
37	Brussels, Belgium .	+50 47 55.5	−11 21.9	100	9.999 131	− 5 25 42.7
38	Budapest, Hungary	+47 29 34.7	−11 33.2	. . .	9.999 208	− 6 24 31.1
39	Cambridge, Eng. .	+52 12 51.6	−11 14.3	26	9.999 090	− 5 8 38.53
40	Cambridge, Mass. .	+42 22 47.6	−11 32.6	24	9.999 340	− 0 23 44.73
41	Cape of Good Hope	−33 56 3.6	+10 43.6	16	9.999 548	− 6 22 10.54
42	Carloforte . . .	+39 8 9	−11 20.8	18	9.999 421	− 5 41 30.7
43	Catania, Sicily . .	+37 30 13.3	−11 11.4	47	9.999 464	− 6 8 36
44	Charkow, Russia .	+50 0 9.6	−11 25.5	138	9.999 153	− 7 33 11.55
45	Charlottesville, Va.	+38 2 1.2	−11 14.6	250	9.999 464	+ 0 5 49.44

No.	Longitude from Greenwich.		Reduction from Gr. Sid. Time of Mean Noon to Local S. T. M. N.	Description.
	In Time.	In Arc.		
	h m s	° ′ ″	s	
1	+ 0 7 0.1	+ 1 45 1.5	+ 1.15	Obs. Paris Academy of Science, Hendaye.
2	− 9 14 20.30	−138 35 4.5	− 91.06	South Australia.
3	+ 4 55 6.8	+ 73 46 42.0	+ 48.48	Dudley Obs. Old Obs. 36″.8 N., 6^{s}.79 E.
4	− 0 12 8.55	− 3 2 8.2	− 2.00	At Bouzaréah, near Algiers. Old Obs. 3′.8 S., 8^{s} E.
5	+ 5 20 5.39	+ 80 1 20.8	+ 52.58	Univ. of Pittsburgh. Old Obs., 76″.4 S., 2^{s}.46 E.
6	+ 4 50 5.93	+ 72 31 29.0	+ 47.66	Amherst College Obs. Old Obs. 20″.6 N., 1^{s}.26 E.
7	+ 5 34 55.19	+ 83 43 47.8	+ 55.02	Detroit Obs. of the University of Michigan.
8	+ 5 53 35.89	+ 88 23 58.4	+ 58.09	Underwood Obs. of the Lawrence University.
9	− 0 45 1.34	− 11 15 20.1	− 7.40	Near Florence.
10	+ 4 46 11.73	+ 71 32 56.0	+ 47.02	Branch of the Harvard College Observatory.
11	+ 0 26 35.4	+ 6 38 51.0	+ 4.37	University Observatory.
12	− 1 34 52.92	− 23 43 13.8	− 15.59	National Observatory of Greece.
13	+ 5 6 26.0	+ 76 36 30	+ 50.34	Johns Hopkins University Observatory.
14	− 0 43 33.65	− 10 53 24.8	− 7.16	Remeis Observatory.
15	− 0 8 28.0	− 2 7 0	− 1.39	Fabra Obs. of the Royal Acad. of Sci. and Arts.
16	− 7 43 38	−115 54 30	− 76.16	International Latitude Obs. West Australia.
17	+ 5 56 7.3	+ 89 1 49.5	+ 58.50	Smith Observatory of Beloit College.
18	− 0 21 12.75	− 5 18 11.2	− 3.48	Observatory of Naval School.
19	+ 8 9 2.72	+122 15 40.8	+ 80.34	Student's Obs. of the University of California.
20	− 0 53 34.85	− 13 23 42.8	− 8.80	Royal Obs. Old Obs. 56″.4 N., 0^{s}.39 W.
21	− 0 53 27.45	− 13 21 51.8	− 8.78	Urania Observatory.
22	− 0 53 54.2	− 13 28 33	− 8.86	Treptow Observatory.
23	− 0 29 45.73	− 7 26 26.0	− 4.89	Observatory of the Cantonal University.
24	− 0 23 57.17	− 5 59 17.6	− 3.94	National Observatory.
25	+ 5 1 31.85	+ 75 22 57.8	+ 49.53	Sayre Obs. of Lehigh Univ. at South Bethlehem.
26	+ 0 31 40.9	+ 7 55 13.5	+ 5.20	Private observatory of the Earl of Rosse.
27	+ 5 46 54	+ 86 43 30	+ 56.99	Kirkwood Obs. of the University of Indiana.
28	+ 4 56 54.20	+ 74 13 33.0	+ 48.77	National Obs. of the Republic of Colombia.
29	− 4 51 15.74	− 72 48 56.1	− 47.85	Government Obs. Colaba.
30	− 0 28 23.22	− 7 5 48.3	− 4.66	Royal University Observatory.
31	+ 0 2 5.54	+ 0 31 23.1	+ 0.34	Observatory, Univ. of Bordeaux at Floirac.
32	+ 4 44 19.1	+ 71 4 46.5	+ 46.71	Obs. of Boston Univ. Old Obs. 34″ N., 4^{s}.1 E.
33	− 0 40 31.2	− 10 7 48.0	− 6.66	Observatory of Herr. von Bülow.
34	− 0 35 15.9	− 8 48 58.5	− 5.79	Formerly Olber's Observatory.
35	− 1 8 8.79	− 17 2 11.8	− 11.20	Royal University Observatory.
36	−10 12 6.4	−153 1 36	−100.55	Queensland, Australia.
37	− 0 17 26.9	− 4 21 43.5	− 2.87	Royal Obs. of Belgium. Old Obs. 3′18″N., 1^{s}.8 E.
38	− 1 16 15.3	− 19 3 49.5	− 12.53	University Observatory.
39	− 0 0 22.75	− 0 5 41.2	− 0.06	University of Cambridge Observatory.
40	+ 4 44 31.05	+ 71 7 45.8	+ 46.74	Harvard College Observatory.
41	− 1 13 54.76	− 18 28 41.4	− 12.14	Royal Observatory.
42	− 0 33 14.9	− 8 18 43.5	− 5.46	Internat. Lat. Obs., Sardinia.
43	− 1 0 20	− 15 5 0	− 9.91	Royal Astrophysical Obs. of the University.
44	− 2 24 55.77	− 36 13 56.6	− 23.81	University Observatory.
45	+ 5 14 5.22	+ 78 31 18.3	+ 51.60	Leander McCormick Obs. of Univ. of Virginia.

OBSERVATORIES, 1915.

PLACE.	Geographic Latitude.			Reduction to Geocentric Latitude.		Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Washington.		
	°	′	″	′	″			h	m	s
Chicago, Ill. . .	+41	50	1.0	−11	31.2	. . .	9.999 352	+ 0	42	11.06
Christiania, Norway	+59	54	44.0	−10	4.6	25	9.998 908	− 5	51	9.30
Cincinnati, Ohio .	+39	8	19.5	−11	20.7	249	9.999 437	+ 0	29	25.62
Cleveland, Ohio .	+41	30	14.5	−11	30.2	212	9.999 375	+ 0	18	10.04
Clinton, N. Y. . .	+43	3	17.0	−11	33.9	276	9.999 340	− 0	6	38.33
Coimbra, Portugal	+40	12	24.5	−11	25.6	99	9.999 400	− 4	34	32.7
Columbia, Mo. . .	+38	56	51.7	−11	19.7	225	9.999 440	+ 1	1	2.55
Columbus, Ohio .	+39	59	50.4	−11	24.7	. . .	9.999 398	+ 0	23	46.8
Copenhagen . . .	+55	41	12.6	−10	48.6	14	9.999 005	− 5	58	34.48
Cordoba	−31	25	15.2	+10	18.0	434	9.999 634	− 0	51	27.56
Cracow, Austria .	+50	3	52.0	−11	25.2	220	9.999 157	− 6	28	6.06
Dantzig	+54	21	18.0	−10	59.6	3	9.999 036	− 6	22	55.4
Dehra Dun, India .	+30	18	51.8	−10	5.3	687	9.999 676	−10	20	29.25
Denver, Colo. . .	+39	40	36.4	−11	23.3	1650	9.999 519	+ 1	51	31.85
Des Moines, Iowa .	+41	36	0	−11	30.5	296	9.999 378	+ 1	6	14.78
Dorpat, Russia .	+58	22	47.1	−10	22.1	65	9.998 945	− 6	55	9.07
Dresden, Saxony .	+51	2	16.8	−11	20.8	. . .	9.999 118	− 6	3	10.63
Dublin, Ireland .	+53	23	13.1	−11	6.7	86	9.999 066	− 4	42	54.7
Dun Echt, Scotland	+57	9	36	−10	34.8	141	9.998 979	− 4	58	35.8
Durham, England	+54	46	6.2	−10	56.4	107	9.999 033	− 5	1	56.03
Düsseldorf, Prussia	+51	12	25.0	−11	19.9	26	9.999 115	− 5	35	20.8
Edinburgh, Scotland	+55	55	28.0	−10	46.5	134	9.999 007	− 4	55	31.6
Edinburgh, Scotland	+55	57	23.2	−10	46.2	106	9.998 995	− 4	55	32.7
Elmira, N. Y. . .	+42	6	25	−11	31.9	. . .	9.999 345	− 0	1	1.88
Evanston, Ill. . .	+42	3	33.4	−11	31.8	175	9.999 358	+ 0	42	26.5
Flagstaff, Ariz. .	+35	12	30.4	−10	54.7	2210	9.999 667	+ 2	18	28.79
Gaithersburg, Md.	+39	8	13.2	−11	20.7	165	9.999 431	+ 0	0	31.95
Geneva, N. Y. . .	+42	52	46.2	−11	33.6	152	9.999 336	− 0	0	14.78
Geneva, Switzerland	+46	11	58.8	−11	35.2	406	9.999 268	− 5	32	52.49
Genoa, Italy . .	+44	25	9.3	−11	35.5	105	9.999 293	− 5	43	57.11
Georgetown, D. C.	+38	54	26.7	−11	19.5	46	9.999 429	+ 0	0	2.48
Glasgow, Mo. . .	+39	13	45.6	−11	21.1	227	9.999 433	+ 1	3	2.30
Glasgow, Scotland	+55	52	42.8	−10	46.9	55	9.999 003	− 4	51	5.23
Gotha, Germany .	+50	56	37.9	−11	21.2	320	9.999 142	− 5	51	6.27
Göttingen, Prussia	+51	31	47.9	−11	18.2	160	9.999 116	− 5	48	2.07
Greencastle, Ind. .	+39	38	46.6	−11	23.1	262	9.999 425	+ 0	39	8.56
Greenwich, England	+51	28	38.1	−11	18.5	47	9.999 110	− 5	8	15.78
Hamburg, Germany	+53	28	46.0	−11	6.1	40	9.999 060	− 5	49	14.3
Hamburg, Germany	+53	33	7.0	−11	5.6	25	9.999 057	− 5	48	9.6
Hamburg, Germany	+53	32	51.8	−11	5.6	30	9.999 058	− 5	48	9.20
Hanover, N. H. .	+43	42	15.3	−11	34.8	183	9.999 317	− 0	19	7.87
Haverford, Pa. .	+40	0	40.1	−11	24.8	. . .	9.999 398	− 0	7	3.08
Heidelberg, Baden	+49	23	55.2	−11	27.8	570	9.999 198	− 5	43	8.91
Heidelberg, Baden	+49	23	54.9	−11	27.8	562	9.999 198	− 5	43	10.03
Helsingfors, Finland	+60	9	42.6	−10	1.5	38	9.998 903	− 6	48	4.93
Herény, Hungary .	+47	15	47.4	−11	33.7	229	9.999 229	− 6	14	40.5

No.	Longitude from Greenwich.		Reduction from Gr. Sid. Time of Mean Noon to Local S. T. M. N.	Description.
	In Time.	In Arc.		
	h m s	° ′ ″	s	
46	+5 50 26.84	+ 87 36 42.6	+57.57	Old Obs.; transferred to Evanston, Ill., in 1887.
47	−0 42 53.52	− 10 43 22.8	− 7.05	Observatory of the University.
48	+5 37 41.40	+ 84 25 21.0	+55.48	Univ.Obs.on Mt.Lookout.OldObs.1′53″S.17^s.6W.
49	+5 26 25.82	+ 81 36 27.3	+53.62	Obs. of Case School of Applied Science.
50	+5 1 37.45	+ 75 24 21.7	+49.55	Litchfield Obs. of Hamilton College.
51	+0 33 43.1	+ 8 25 46.5	+ 5.54	Royal Astronomical Observatory of Portugal.
52	+6 9 18.33	+ 92 19 35.0	+60.67	Laws Observatory of the University of Missouri.
53	+5 32 2.6	+ 83 0 39.0	+54.55	Emerson McMillan Obs. of Ohio State Univ.
54	−0 50 18.70	− 12 34 40.5	− 8.26	University Observatory, Denmark.
55	+4 16 48.22	+ 64 12 3.3	+42.19	National Observatory of Argentine Republic.
56	−1 19 50.28	− 19 57 34.2	−13.12	Royal University Observatory.
57	−1 14 39.6	− 18 39 54.0	−12.26	Western Prussia.
58	−5 12 13.47	− 78 3 22.0	−51.29	Obs. Great Trigonometric Survey of India.
59	+6 59 47.63	+104 56 54.4	+68.96	Chamberlin Observatory of the Univ. of Denver.
60	+6 14 30.56	+ 93 37 38.4	+61.52	Drake University Observatory.
61	−1 46 53.29	− 26 43 19.3	−17.56	Observatory Imperial University (Jurjew).
62	−0 54 54.85	− 13 43 42.7	− 9.02	Baron Engelhardt's Observatory.
63	+0 25 21.1	+ 6 20 16.5	+ 4.16	Observatory of Trinity College at Dunsink.
64	+0 9 40.0	+ 2 25 0.0	+ 1.59	Formerly Lord Crawford's Observatory.
65	+0 6 19.75	+ 1 34 56.3	+ 1.04	Observatory of the University.
66	−0 27 5.0	− 6 46 15.0	− 4.45	Municipal Observatory, Bilk.
67	+0 12 44.2	+ 3 11 3.0	+ 2.09	Royal Obs. of Scotland, Blackford Hill.
68	+0 12 43.1	+ 3 10 46.5	+ 2.09	City Observatory, Calton Hill.
69	+5 7 13.90	+ 76 48 28.5	+50.47	Elmira College Observatory.
70	+5 50 42.3	+ 87 40 34.5	+57.61	Dearborn Observatory of North Western Univ.
71	+7 26 44.57	+111 41 8.6	+73.39	Lowell Observatory.
72	+5 8 47.73	+ 77 11 56.0	+50.73	International Latitude Observatory.
73	+5 8 1.00	+ 77 0 15.0	+50.60	Smith Observatory.
74	−0 24 36.71	− 6 9 10.7	− 4.04	Municipal Observatory.
75	−0 35 41.33	− 8 55 20.0	− 5.86	Hydrographic Institute.
76	+5 8 18.26	+ 77 4 33.9	+50.65	Georgetown College Observatory, Washington.
77	+6 11 18.08	+ 92 49 31.2	+61.00	Morrison Observatory.
78	+0 17 10.55	+ 4 17 38.3	+ 2.82	University Observatory.
79	−0 42 50.49	− 10 42 37.3	− 7.04	Ducal Observatory, Saxe-Coburg-Gotha.
80	−0 39 46.29	− 9 56 34.3	− 6.53	Royal University Observatory.
81	+5 47 24.34	+ 86 51 5.1	+57.07	McKim Observatory of De Pauw University.
82	0 0 0.00	0 0 0.0	0.00	Royal Observatory.
83	−0 40 58.5	− 10 14 37.5	− 6.73	New Observatory, Bergedorf.
84	−0 39 53.8	− 9 58 27.0	− 6.55	Old Observatory.
85	−0 39 53.42	− 9 58 21.3	− 6.55	Imperial Marine Observatory.
86	+4 49 7.91	+ 72 16 58.7	+47.50	Shattuck Observatory of Dartmouth College.
87	+5 1 12.70	+ 75 18 10.5	+49.48	Haverford College Observatory.
88	−0 34 53.13	− 8 43 17.0	− 5.73	Astronomical Institute, Königstuhl.
89	−0 34 54.25	− 8 43 33.7	− 5.73	Astrophysical Institute, Königstuhl.
90	−1 39 49.15	− 24 57 17.3	−16.40	University Observatory.
91	−1 6 24.7	− 16 36 10.5	−10.91	Astrophysical Obs., near Steinamanger.

No.	Place.	Geographic Latitude.			Reduction to Geocentric Latitude.		Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Washington.		
		°	′	″	′	″			h	m	s
92	Hong Kong, China	+22	18	13.4	− 8	7.4	34	9.999 793	+11	15	2.36
93	Iowa City, Iowa	+41	40	0	−11	30.7	183	9.999 369	+ 0	57	50
94	Ithaca, N. Y.	+42	26	47.3	−11	32.6	256	9.999 354	− 0	2	19.79
95	Jamaica, West Indies	+18	24	51	− 6	55.9	. . .	9.999 855	+ 0	3	13.70
96	Jena, Saxe-Weimar	+50	55	34.9	−11	21.3	156	9.999 131	− 5	54	36.05
97	Jena, Saxe-Weimar	+50	56	11.0	−11	21.3	174	9.999 132	− 5	54	36.56
98	Johannesburg	−26	10	54.5	+ 9	9.8	1806	9.999 840	− 7	0	33.8
99	Kalocsa	+46	31	41.7	−11	34.8	117	9.999 240	− 6	24	10.12
100	Kasan, Russia	+55	50	20.0	−10	47.3	98	9.999 007	− 8	23	32.3
101	Kasan, Russia	+55	47	24.3	−10	47.7	79	9.999 007	− 8	24	44.82
102	Kew, Eng.	+51	28	6	−11	18.5	11	9.999 108	− 5	7	0.7
103	Kief, Russia	+50	27	10.5	−11	23.5	182	9.999 145	− 7	10	16.42
104	Kiel, Prussia	+54	20	27.6	−10	59.7	48	9.999 040	− 5	48	51.33
105	Kis-Kartal	+47	41	54.8	−11	32.8	. . .	9.999 202	− 6	26	27.5
106	Königsberg, Prussia	+54	42	50.4	−10	56.8	22	9.999 029	− 6	30	14.82
107	Kremsmünster	+48	3	23.1	−11	32.0	384	9.999 220	− 6	4	47.37
108	La Plata	−34	54	30.3	+10	52.2	12	9.999 524	− 1	16	38.8
109	Lawrence, Kansas	+38	57	26	−11	7.8	311	9.999 495	+ 1	12	42
110	Leiden, Netherlands	+52	9	20.0	−11	14.6	4	9.999 090	− 5	26	11.95
111	Leipzig, Saxony	+51	20	5.9	−11	19.2	119	9.999 118	− 5	57	49.76
112	Liège, Belgium	+50	37	7	−11	22.8	127	9.999 137	− 5	30	31.0
113	Lisbon, Portugal	+38	42	30.5	−11	18.5	94	9.999 437	− 4	31	31.10
114	Liverpool, Eng.	+53	24	4.8	−11	6.6	62	9.999 064	− 4	55	58.45
115	Lund, Sweden	+55	41	51.6	−10	48.5	38	9.999 006	− 6	1	0.79
116	Lussinpiccolo	+44	32	11.0	−11	35.5	42	9.999 286	− 6	6	8.19
117	Lyons, France	+45	41	41.0	−11	35.5	300	9.999 274	− 5	27	24.33
118	Madison, Wis.	+43	4	36.8	−11	33.9	292	9.999 340	+ 0	49	22.15
119	Madras, India	+13	4	8.0	− 5	5.5	7	9.999 926	−10	29	14.90
120	Madrid, Spain	+40	24	29.7	−11	26.4	655	9.999 433	− 4	53	30.66
121	Manila, P. I.	+14	35	25	− 5	38.2	3	9.999 908	+10	47	54
122	Mare Island, Cal.	+38	5	55.8	−11	15.0	22	9.999 447	+ 3	0	49.8
123	Markree, Ireland	+54	10	31.8	−11	1.0	45	9.999 044	− 4	34	27.4
124	Marseilles, France	+43	18	17.5	−11	34.3	75	9.999 320	− 5	29	50.37
125	Mauritius	−20	5	39	+ 7	27.7	55	9.999 832	− 8	58	28.4
126	Melbourne, Victoria	−37	49	53.4	+11	13.4	28	9.999 454	+ 9	11	50.2
127	Meudon, France	+48	48	18	−11	29.8	162	9.999 185	− 5	17	11.4
128	Middletown, Conn.	+41	33	16.0	−11	30.4	. . .	9.999 359	− 0	17	38.60
129	Milan, Italy	+45	27	59.3	−11	35.6	120	9.999 268	− 5	45	1.70
130	Minneapolis, Minn.	+44	58	40.0	−11	35.7	260	9.999 290	+ 1	4	41.06
131	Mizusawa, Japan	+39	8	3.6	−11	20.7	62	9.999 424	+ 9	27	13.47
132	Modena, Italy	+44	38	52.8	−11	35.6	. . .	9.999 280	− 5	51	58.7
133	Montreal, Canada	+45	30	17.0	−11	35.6	67	9.999 263	− 0	13	57.15
134	Moscow, Russia	+55	45	19.8	−10	48.0	150	9.999 012	− 7	38	32.87
135	Mount Hamilton	+37	20	25.6	−11	10.4	1283	9.999 552	+ 2	58	19.11
136	Mount Wilson	+34	12	59.5	−10	46.2	1800	9.999 663	+ 2	43	58.55

o.	Longitude from Greenwich. In Time.	Longitude from Greenwich. In Arc.	Reduction from Gr. Sid. Time of Mean Noon to Local S. T. M. N.	Description.
	h m s	° ′ ″	s	
92	−7 36 41.86	−114 10 27.9	−75.01	British Colonial Observatory.
93	+6 6 6	+ 91 31 30	+60.14	Obs. of the State Univ. of Iowa.
94	+5 5 55.99	+ 76 28 59.9	+50.26	Observatory of Cornell University.
95	+5 11 29.48	+ 77 52 22.2	+51.17	Mr. Hall's Observatory, Montego Bay.
96	−0 46 20.27	− 11 35 4.0	− 7.61	University Observatory.
97	−0 46 20.78	− 11 35 11.7	− 7.61	The late Dr. Winkler's Observatory.
98	−1 52 18.0	− 28 4 30.0	−18.45	Union Observatory, Transvaal.
99	−1 15 54.34	− 18 58 35.1	−12.47	Haynald Obs., Hungary.
00	−3 15 16.5	− 48 49 7.5	−32.08	Englehardt Observatory.
01	−3 16 29.04	− 49 7 15.6	−32.28	Imperial Univ. Observatory.
102	+0 1 15.1	+ 0 18 46.5	+ 0.21	Meteorlogical Obs., Kew Gardens, London.
103	−2 2 0.64	− 30 30 9.6	−20.04	Imperial University Observatory.
104	−0 40 35.55	− 10 8 53.3	− 6.67	Old position of Transit Circle, $0''.9$ N., $0^s.12$ E.
105	−1 18 11.7	− 19 32 55.5	−12.85	Near Aszód, Hungary.
106	−1 21 59.04	− 20 29 45.6	−13.47	Royal University Observatory.
107	−0 56 31.59	− 14 7 53.9	− 9.29	Obs. of the Benedictines, Austria.
108	+3 51 37.0	+ 57 54 15.0	+38.05	Obs. National Univ., Argentine Republic.
109	+6 20 58	+ 95 14 30	+62.58	Obs. of the State Univ. of Kansas.
110	−0 17 56.17	− 4 29 2.6	− 2.95	University Observatory.
111	−0 49 33.98	− 12 23 29.7	− 8.14	University Observatory.
112	−0 22 15.2	− 5 33 48.0	− 3.66	University Observatory, Cointe.
113	+0 36 44.68	+ 9 11 10.2	+ 6.04	Royal Astronomical Obs., Tapada.
114	+0 12 17.33	+ 3 4 20.0	+ 2.02	Bidston, Birkenhead.
115	−0 52 45.01	− 13 11 15.1	− 8.67	Royal Observatory of the University.
116	−0 57 52.41	− 14 28 6.1	− 9.51	Manora Observatory, Austria.
117	−0 19 8.55	− 4 47 8.3	− 3.14	Obs. of the Univ., St. Genis, Laval.
118	+5 57 37.93	+ 89 24 29.0	+58.75	Washburn Obs. of Univ. of Wisconsin.
119	−5 20 59.12	− 80 14 46.8	−52.73	Founded by East India Company.
120	+0 14 45.12	+ 3 41 16.8	+ 2.42	Ast. and Meteorological Observatory.
121	−8 3 50	−120 57 30	−79.48	Meteorological Observatory.
122	+8 9 5.6	+122 16 24.0	+80.35	Chronometer and Time Station, Navy Yard.
123	+0 33 48.4	+ 8 27 6.0	+ 5.55	Obs. of Col. Cooper, near Collooney.
124	−0 21 34.59	− 5 23 38.9	− 3.54	National Obs., Univ. of Aix-Marseilles.
125	−3 50 12.6	− 57 33 9.0	−37.82	Royal Alfred Observatory, Port-Louis.
126	−9 39 54.0	−144 58 30.0	−95.26	State Obs.; transf. from Williamstown in 1861.
127	−0 8 55.6	− 2 13 54.0	− 1.47	Seine-et-Oise, near Paris.
128	+4 50 37.18	+ 72 39 17.7	+47.74	Wesleyan University Observatory.
129	−0 36 45.92	− 9 11 28.8	− 6.04	Royal Observatory, Brera.
130	+6 12 56.84	+ 93 14 12.6	+61.27	Obs. of the State University of Minnesota.
131	−9 24 30.75	−141 7 41.3	−92.74	International Latitude Observatory.
132	−0 43 42.9	− 10 55 43.5	− 7.18	Ducal Observatory.
133	+4 54 18.63	+ 73 34 39.4	+48.35	McGill University Observatory.
134	−2 30 17.09	− 37 34 16.3	−24.69	Obs. of the Imperial University, Presnia.
135	+8 6 34.89	+121 38 43.3	+79.93	Lick Obs. of the University of California.
136	+7 52 14.33	+118 3 34.9	+77.58	Solar Observatory, near Pasadena, Cal.

No.	Place.	Geographic Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Washington.
		° ′ ″	′ ″			h m s
137	Munich, Bavaria .	+48 8 45.5	−11 31.7	528	9.999 227	− 5 54 41.85
138	Naples, Italy . .	+40 51 46.3	−11 28.1	154	9.999 387	− 6 5 17.51
139	Nashville, Tenn. .	+36 8 54.4	−11 2.0	. . .	9.999 494	+ 0 38 56.4
140	Natal, S. Africa .	−29 50 46.6	+ 9 59.6	79	9.999 645	− 7 12 16.96
141	Neuchâtel . . .	+46 59 50.6	−11 34.1	488	9.999 254	− 5 36 5.71
142	New Brunswick, N. J.	+40 30 1.3	−11 26.7	21	9.999 387	− 0 10 28.4
143	New Haven, Conn.	+41 19 22.3	−11 29.6	40	9.999 368	− 0 16 35.20
144	New York, N. Y. .	+40 48 34.6	−11 27.9	. . .	9.999 378	− 0 12 26
145	Nice, France . .	+43 43 16.9	−11 34.9	376	9.999 330	− 5 37 27.96
146	Nikolaieff, Russia .	+46 58 21.8	−11 34.2	55	9.999 225	− 7 16 9.58
147	Northampton, Mass.	+42 19 2	−11 32.4	81	9.999 345	− 0 17 42.7
148	Northfield, Minn. .	+44 27 41.6	−11 35.5	320	9.999 307	+ 1 4 20.03
149	Oakland, Cal. . .	+37 48 5	−11 13.2	11	9.999 454	+ 3 0 50.77
150	Odessa, Russia . .	+46 28 37.9	−11 34.9	. . .	9.999 234	− 7 11 18.0
151	Odessa, Russia . .	+46 28 36.7	−11 34.9	55	9.999 237	− 7 11 17.88
152	O-Gyalla, Hungary	+47 52 27.3	−11 32.4	113	9.999 206	− 6 21 1.32
153	Omaha, Nebr. . .	+41 16 5.6	−11 29.5	344	9.999 390	+ 1 15 31.18
154	Oncativo, Arg. Rep.	−31 55 10	+10 23.5	280	9.999 613	− 0 53 31.0
155	Orono, Maine . .	+44 53 58	−11 35.6	41	9.999 277	− 0 33 35.5
156	Ottawa, Canada .	+45 23 37.6	−11 35.6	85	9.999 267	− 0 5 23.78
157	Oxford, Miss. . .	+34 22 12.6	−10 47.5	. . .	9.999 536	+ 0 49 51.3
158	Oxford, Eng. . .	+51 45 35.4	−11 16.9	65	9.999 104	− 5 3 13.2
159	Oxford, Eng. . .	+51 45 34.2	−11 16.9	64	9.999 104	− 5 3 15.4
160	Padua, Italy . .	+45 24 5	−11 35.6	30	9.999 263	− 5 55 44.97
161	Palermo, Sicily .	+38 6 44.0	−11 15.1	72	9.999 450	− 6 1 41.68
162	Paris, France . .	+48 50 11.2	−11 29.8	61	9.999 178	− 5 17 36.75
163	Perth	−31 57 8.9	+10 23.8	61	9.999 597	+11 8 22.48
164	Philadelphia, Pa. .	+39 58 2.1	−11 24.6	74	9.999 404	− 0 7 9.2
165	Pola, Austria . .	+44 51 48.7	−11 35.6	30	9.999 277	− 6 3 38.67
166	Potsdam, Prussia .	+52 22 56.0	−11 13.3	97	9.999 091	− 6 0 31.7
167	Poughkeepsie, N. Y.	+41 41 18	−11 30.8	46	9.999 359	− 0 12 42.13
168	Prague, Bohemia .	+50 5 15.8	−11 25.1	197	9.999 155	− 6 5 56.1
169	Princeton, N. J. .	+40 20 55.8	−11 26.1	50	9.999 393	− 0 9 36.34
170	Providence, R. I. .	+41 50 21	−11 31.2	64	9.999 356	− 0 22 39.83
171	Providence, R. I. .	+41 49 46.4	−11 31.2	. . .	9.999 352	− 0 22 38.14
172	Pulkowa, Russia .	+59 46 18.7	−10 6.2	74	9.998 914	− 7 9 34.42
173	Quebec, Canada .	+46 47 59.2	−11 34.4	90	9.999 231	− 0 23 23.14
174	Quito	− 0 14 0	+ 0 5.6	2908	0.000 198	+ 0 5 50.88
175	Riga, Russia . .	+56 57 9.3	−10 36.9	. . .	9.998 974	− 6 44 43.95
176	Rio de Janeiro . .	−22 54 23.6	+ 8 17.7	61	9.999 784	− 2 15 34.4
177	Rome, Italy . .	+41 53 53.6	−11 31.3	51	9.999 354	− 5 58 11.33
178	Rome, Italy . .	+41 53 33.5	−11 31.3	65	9.999 355	− 5 58 12.15
179	Rome, Italy . .	+41 54 4.8	−11 31.4	100	9.999 357	− 5 58 5.25
180	San Fernando . .	+36 27 42.0	−11 4.3	30	9.999 488	− 4 43 26.6
181	San Francisco, Cal.	+37 47 27.9	−11 13.2	. . .	9.999 454	+ 3 1 27.08

No.	Longitude from Greenwich.		Reduction from Gr. Sid. Time of Mean Noon to Local S. T. M. N.	Description.
	In Time.	In Arc.		
	h m s	° ′ ″	s	
137	−0 46 26.07	− 11 36 31.0	− 7.63	Royal Observatory.
138	−0 57 1.73	− 14 15 26.0	− 9.37	Royal Obs., Capo di Monte.
139	+5 47 12.2	+ 86 48 3.0	+57.04	Observatory of Vanderbilt University.
140	−2 4 1.18	− 31 0 17.7	−20.37	Government Observatory, Durban.
141	−0 27 49.93	− 6 57 29.0	− 4.57	Cantonal Observatory, Switzerland.
142	+4 57 47.4	+ 74 26 51	+48.92	Schanck Obs., Rutgers College.
143	+4 51 40.58	+ 72 55 8.7	+47.92	Yale University Obs. Old Obs. 45″.8 S., $1^{s}.58$ W.
144	+4 55 50	+ 73 57 30	+48.60	Columbia Univ. Obs. Old Obs. 3′ 11″.5 S., $3^{s}.6$ E.
145	−0 29 12.18	− 7 18 2.7	− 4.80	Mt. Gros, near Nice.
146	−2 7 53.80	− 31 58 27.0	−21.01	Naval Observatory.
147	+4 50 33.1	+ 72 38 16.5	+47.73	Smith College Observatory.
148	+6 12 35.81	+ 93 8 57.1	+61.21	Goodsell Observatory of Carleton College.
149	+8 9 6.55	+122 16 38.3	+80.35	Chabot Observatory.
150	−2 3 2.18	− 30 45 32.7	−20.21	Branch of Pulkowa Observatory.
151	−2 3 2.10	− 30 45 31.5	−20.21	University Observatory.
152	−1 12 45.54	− 18 11 23.1	−11.95	Royal Astrophysical Observatory.
153	+6 23 46.96	+ 95 56 44.4	+63.05	Creighton University Observatory.
154	+4 14 44.8	+ 63 41 12.0	+41.85	International Latitude Observatory.
155	+4 34 40.3	+ 68 40 4.5	+45.12	Observatory of the University of Maine.
156	+5 2 52.00	+ 75 43 0.0	+49.75	Dominion Observatory.
157	+5 58 7.1	+ 89 31 46.5	+58.83	Observatory of the University of Mississipi.
158	+0 5 2.6	+ 1 15 39.0	+ 0.83	Radcliffe Observatory.
159	+0 5 0.4	+ 1 15 6.0	+ 0.82	University Observatory.
160	−0 47 29.19	− 11 52 17.9	− 7.80	Royal University Observatory.
161	−0 53 25.90	− 13 21 28.5	− 8.78	Royal Observatory.
162	−0 9 20.97	− 2 20 14.6	− 1.53	National Observatory.
163	−7 43 21.74	−115 50 26.1	−76.12	State Observatory, West Australia.
164	+5 1 6.6	+ 75 16 39.0	+49.46	Flower Observatory, University of Pennsylvania.
165	−0 55 22.89	− 13 50 43.3	− 9.10	Obs. of the Imperial Hydrographic Office.
166	−0 52 15.9	− 13 3 58.5	− 8.59	Royal Astrophysical Observatory.
167	+4 55 33.65	+ 73 53 24.7	+48.55	Vassar College Observatory.
168	−0 57 40.3	− 14 25 4.5	− 9.47	Royal Observatory of the University.
169	+4 58 39.44	+ 74 39 51.6	+49.06	Halsted Observatory of Princeton University.
170	+4 45 35.95	+ 71 23 59.3	+46.92	Ladd Observatory of Brown University.
171	+4 45 37.64	+ 71 24 24.6	+46.92	Mr. Seagrave's Observatory.
172	−2 1 18.64	− 30 19 39.6	−19.93	Obs. Central Nicolas, near St. Petersburg.
173	+4 44 52.64	+ 71 13 9.6	+46.80	Bonner's Hill.
174	+5 14 6.66	+ 78 31 39.9	+51.60	National Observatory of Ecuador.
175	−1 36 28.17	− 24 7 2.6	−15.85	Polytechnic School Observatory.
176	+2 52 41.4	+ 43 10 21.0	+28.37	National Observatory of Brazil.
177	−0 49 55.55	− 12 28 53.3	− 8.20	Royal Observatory at Roman College.
178	−0 49 56.37	− 12 29 5.6	− 8.20	Royal University Observatory at Capitol.
179	−0 49 49.47	− 12 27 22.0	− 8.18	Vatican Observatory.
180	+0 24 49.2	+ 6 12 18.0	+ 4.08	Naval Observatory, near Cadiz, Spain.
181	+8 9 42.86	+122 25 42.9	+80.45	Davidson Observatory.

No.	Place.	Geographic Latitude.	Reduction to Geocentric Latitude.	Altitude (*Meters*).	Log ρ (*Including altitude*).	Longitude from Washington.
		° ′ ″	′ ″			h m s
182	San Luis, Arg. Rep.	−33 17 45.7	+10 37.6	800	9.999 616	− 0 42 54
183	Santiago, Chile .	−33 26 42.0	+10 39.0	519	9.999 594	− 0 25 29.56
184	South Hadley, Mass.	+42 15 18.2	−11 32.2	76	9.999 346	− 0 17 55.49
185	St. Louis, Mo. . .	+38 38 3.0	−11 18.1	. . .	9.999 432	+ 0 52 33.48
186	St. Petersburg . .	+59 56 32.0	−10 4.2	4	9.998 906	− 7 9 27.2
187	Stockholm, Sweden	+59 20 33.0	−10 11.3	44	9.998 922	− 6 20 29.77
188	Stonyhurst, Eng. .	+53 50 40	−11 3.4	116	9.999 056	− 4 58 23.10
189	Strassburg, Alsace	+48 35 0.3	−11 30.5	144	9.999 190	− 5 39 20.47
190	Swarthmore, Pa. .	+39 54 23.3	−11 24.3	. . .	9.999 401	− 0 6 50.89
191	Sydney, N. S. W. .	−33 51 41.1	+10 42.9	44	9.999 552	+ 8 46 54.68
192	Syracuse, N. Y. .	+43 2 13.1	−11 33.9	160	9.999 332	− 0 3 42.42
193	Tacubaya . . .	+19 24 17.5	− 7 14.8	2280	9.999 995	+ 1 28 30.75
194	Tashkent . . .	+41 19 31.3	−11 29.6	457	9.999 396	− 9 45 26.58
195	Taunton, Mass. .	+41 54 0	−11 31.3	8	9.999 351	− 0 23 56
196	Teramo, Italy . .	+42 39 27	−11 33.1	398	9.999 358	− 6 3 12
197	Tokyo, Japan . .	+35 39 17.5	−10 58.3	. . .	9.999 507	+ 9 32 46.20
198	Toronto, Canada .	+43 39 35.9	−11 34.8	108	9.999 313	+ 0 9 18.87
199	Toulouse, France .	+43 36 45	−11 34.7	194	9.999 320	− 5 14 5.66
200	Triest, Austria . .	+45 38 45.4	−11 35.5	67	9.999 260	− 6 3 18.73
201	Troy, N. Y. . . .	+42 43 52.9	−11 33.4	. . .	9.999 329	− 0 13 33.49
202	Tschardjui . . .	+39 8 10.7	−11 20.7	167	9.999 431	− 9 22 13.1
203	Tulse Hill . . .	+51 26 47.0	−11 18.6	48	9.999 111	− 5 7 48.1
204	Turin, Italy . . .	+45 4 8.0	−11 35.7	276	9.999 288	− 5 39 2.96
205	Tuscaloosa, Ala. .	+33 12 36.8	−10 36.7	. . .	9.999 564	+ 0 41 55.96
206	Ukiah, Cal. . . .	+39 8 12.1	−11 20.7	220	9.999 435	+ 3 4 34.5
207	Upsala, Sweden .	+59 51 29.4	−10 5.2	21	9.998 909	− 6 18 45.93
208	Urbana, Ill. . . .	+40 6 20.2	−11 25.2	236	9.999 412	+ 0 44 38.2
209	Utrecht, Netherlands	+52 5 9.6	−11 15.0	13	9.999 093	− 5 28 46.8
210	Venice, Italy . .	+45 26 10.5	−11 35.6	15	9.999 261	− 5 57 37.90
211	Vienna, Austria .	+48 13 55.4	−11 31.5	240	9.999 205	− 6 13 37.17
212	Vienna, Austria .	+48 12 53.8	−11 31.6	214	9.999 204	− 6 13 41.1
213	Vienna, Austria .	+48 12 46.7	−11 31.6	280	9.999 208	− 6 13 26.89
214	Warsaw, Russia .	+52 13 4.7	−11 14.3	110	9.999 096	− 6 32 23.06
215	Washington, D. C.	+38 55 14.0	−11 19.6	82	9.999 431	0 0 0.00
216	Washington, D. C.	+38 53 38.8	−11 19.4	31	9.999 428	− 0 0 3.63
217	Washington, D. C.	+38 53 17.3	−11 19.4	9	9.999 427	− 0 0 9.6
218	Washington, D. C.	+38 56 14.8	−11 19.7	. . .	9.999 425	− 0 0 15.78
219	Wellesley, Mass. .	+42 17 34.8	−11 32.3	61	9.999 344	− 0 23 3
220	Wellington, N. Z. .	−41 17 3.8	+11 29.5	127	9.999 375	+ 7 12 39.95
221	West Point, N. Y.	+41 23 22.1	−11 29.9	170	9.999 375	− 0 12 25.23
222	Wilhelmshaven .	+53 31 52.2	−11 5.7	8	9.999 057	− 5 40 50.89
223	Williams Bay, Wis.	+42 34 12.6	−11 33.0	335	9.999 356	+ 0 45 57.46
224	Williamstown, Mass.	+42 42 30	−11 33.2	213	9.999 344	− 0 15 26
225	Windsor, N. S. W.	−33 36 30.8	+10 40.6	16	9.999 556	+ 8 48 23.7
226	Zô-Sè, China . .	+31 5 47.7	−10 14.4	100	9.999 619	+10 46 59.5
227	Zürich	+47 22 38.3	−11 33.5	468	9.999 243	− 5 42 28.08

No.	LONGITUDE FROM GREENWICH.		Reduction from Gr. Sid. Time of Mean Noon to Local S. T. M. N.	DESCRIPTION.
	In Time.	In Arc.		
	h m s	° ′ ″	s	
182	+ 4 25 22	+ 66 20 30	+ 43.60	Southern Observatory of Carnegie Institution.
183	+ 4 42 46.22	+ 70 41 33.3	+ 46.45	National Obs. of Chile. Old Obs. 16″.6N.,9^{s}.5 E.
184	+ 4 50 20.29	+ 72 35 4.3	+ 47.70	Observatory of Mt. Holyoke College.
185	+ 6 0 49.26	+ 90 12 18.9	+ 59.27	Washington University Observatory.
186	− 2 1 11.4	− 30 17 51.0	− 19.91	Imperial University Observatory, Russia.
187	− 1 12 13.99	− 18 3 29.9	− 11.87	Observatory of Academy of Science.
188	+ 0 9 52.68	+ 2 28 10.2	+ 1.62	Stonyhurst College Observatory, near Blackburn.
189	− 0 31 4.69	− 7 46 10.3	− 5.11	Imperial University Observatory.
190	+ 5 1 24.89	+ 75 21 13.4	+ 49.52	Sproul Observatory of Swarthmore College.
191	−10 4 49.54	−151 12 23.1	− 99.36	Government Observatory.
192	+ 5 4 33.36	+ 76 8 20.4	+ 50.03	Observatory of Syracuse University.
193	+ 6 36 46.53	+ 99 11 38.0	+ 65.18	National Observatory of Mexico.
194	− 4 37 10.80	− 69 17 42.0	− 45.53	Turkestan, Russia.
195	+ 4 44 20	+ 71 5 0	+ 46.71	Mr. Metcalf's Observatory.
196	− 0 54 56	− 13 44 0	− 9.02	At Collurania, near Teramo.
197	− 9 18 58.02	−139 44 30.3	− 91.82	University Observatory.
198	+ 5 17 34.65	+ 79 23 39.7	+ 52.17	University Observatory.
199	− 0 5 49.88	− 1 27 28.2	− 0.96	University Observatory.
200	− 0 55 2.95	− 13 45 44.3	− 9.04	Imperial Maritime Observatory.
201	+ 4 54 42.29	+ 73 40 34.3	+ 48.41	Observatory Rensselaer Polytechnic Institute.
202	− 4 13 57.3	− 63 29 19.5	− 41.72	International Latitude Obs., Turkestan.
203	+ 0 0 27.7	+ 0 6 55.5	+ 0.08	Observatory of Sir W. Huggins, London.
204	− 0 30 47.18	− 7 41 47.7	− 5.06	Royal Observatory, Palazzo Madama.
205	+ 5 50 11.74	+ 87 32 56.1	+ 57.53	Observatory of the University of Alabama.
206	+ 8 12 50.3	+123 12 35	+ 80.96	International Latitude Observatory.
207	− 1 10 30.15	− 17 37 32.3	− 11.58	University Observatory.
208	+ 5 52 54.0	+ 88 13 30	+ 57.97	Observatory of the University of Illinois.
209	− 0 20 31.0	− 5 7 45.0	− 3.37	University Observatory, Sonnenborgh.
210	− 0 49 22.12	− 12 20 31.8	− 8.11	Observatory of the Nautical Institute.
211	− 1 5 21.39	− 16 20 20.9	− 10.74	Imperial Univ. Obs. Old Obs. 1′ 20″ S.,10^{s}.25 E.
212	− 1 5 25.3	− 16 21 19.5	− 10.75	Oppolzer Observatory, Josephstadt.
213	− 1 5 11.11	− 16 17 46.7	− 10.71	Kuffner Observatory, Ottakring.
214	− 1 24 7.28	− 21 1 49.2	− 13.82	Imperial University Observatory.
215	+ 5 8 15.78	+ 77 3 56.7	+ 50.64	U. S. Naval Observatory, Georgetown Heights.
216	+ 5 8 12.15	+ 77 3 2.3	+ 50.63	Old U. S. Naval Observatory. 1842–1893.
217	+ 5 8 6.2	+ 77 1 33.0	+ 50.61	Smithsonian Astrophysical Observatory.
218	+ 5 8 0.0	+ 77 0 0.0	+ 50.60	Catholic University Obs., Brookland, D. C.
219	+ 4 45 13	+ 71 18 15	+ 46.85	Whitin Observatory of Wellesley College.
220	−11 39 4.27	−174 46 4.0	−114.84	Hector Observatory. Old Obs. 16″.7 N., 1^{s}.04 E.
221	+ 4 55 50.55	+ 73 57 38.3	+ 48.60	U. S. Military Academy. Old Obs. 9″ N., 1^{s}.2 E.
222	− 0 32 35.11	− 8 8 46.7	− 5.35	Imperial Naval Observatory of Germany.
223	+ 5 54 13.24	+ 88 33 18.6	+ 58.19	Yerkes Observatory of University of Chicago.
224	+ 4 52 50	+ 73 12 30	+ 48.10	Field Memorial Observatory, Williams College.
225	−10 3 20.5	−150 50 7.5	− 99.11	Mr. John Tebbutt's Observatory.
226	− 8 4 44.7	−121 11 10.5	− 79.63	Obs. of the Jesuits near Shanghai.
227	− 0 34 12.30	− 8 33 4.5	− 5.62	Obs. of the Polytechnic School, Switzerland.

THE COMPUTATION OF LUNAR DISTANCES.

The tables of lunar distances formerly given on pages XIII to XVIII, inclusive, for each month of the Greenwich Ephemeris, are omitted, as it has been decided by the authorities of the Navy Department that they are now of little practical use to navigators. However, in case it is desired to use this method, the angular distance between the Moon and any heavenly body may be calculated by solving the spherical triangle of which the known parts are the polar distances of the Moon and the other body and the difference of their right ascensions, or, in other words, the angle at the pole between their hour-circles. Then, the Greenwich mean time of the observation being approximately known, and the lunar distances for the star or other body calculated for the even hour before and after, the required lunar distance may be interpolated and the longitude derived by the methods given in books on navigation.

EXAMPLE 1.

Find the lunar distance of α Arietis, January 15, 1915, at 6 P. M. Greenwich Mean Time.

Let α and δ = Right Ascension and Declination of the star
" α' and δ' = " " " " " " Moon
" D = Lunar Distance
Also let $\tan M = \tan \delta' \sec (\alpha - \alpha')$
Then $\cos D = \sin \delta' \cos (M - \delta) \operatorname{cosec} M$

$\alpha = 2^h\ 2^m\ 23^s.5$
$\alpha' = 19^h\ 55^m\ 31^s.7$
$\alpha - \alpha' = 6^h\ 6^m\ 51^s.8$
$\alpha - \alpha' = 91°\ 42'\ 57''$
$\delta' = -23°\ 29'\ 14''$
$\tan \delta' = 9.638037\ n$
$\sec (\alpha - \alpha') = \underline{1.523712}\ n$
$\tan M = 1.161749$

$M = 266°\ 3'\ 30''$
$\delta = +\ 23°\ 3'\ 52''$
$M - \delta = 242°\ 59'\ 38''$
$\sin \delta' = 9.600477\ n$
$\cos (M - \delta) = 9.657137\ n$
$\operatorname{cosec} M = \underline{0.001029}\ n$
$\cos D = 9.258643\ n$
$D = 100°\ 27'\ 5''$

EXAMPLE 2.

Find the lunar distance of Venus, June 8, 1915, at midnight, Greenwich Mean Time. In this case the distance is smaller and the following method is more accurate:

Let α and δ = Right Ascension and Declination of the planet
" α' and δ' = " " " " " " Moon
" D = Lunar Distance
Also let $\tan N = \tan \tfrac{1}{2} (\alpha - \alpha') \cos \tfrac{1}{2} (\delta + \delta') \operatorname{cosec} \tfrac{1}{2} (\delta - \delta')$
Then $\sin \tfrac{1}{2} D = \sin \tfrac{1}{2} (\alpha - \alpha') \cos \tfrac{1}{2} (\delta + \delta') \operatorname{cosec} N$
Sin N and $\sin \tfrac{1}{2} (\alpha - \alpha')$ have the same algebraic sign.

$\alpha = 3^h\ 17^m\ 57^s.8$
$\alpha' = 2^h\ 6^m\ 45^s.3$
$\alpha - \alpha' = 1^h\ 11^m\ 12^s.5$
$\alpha - \alpha' = 17°\ 48'\ 8''$
$\delta = +16°\ 45'\ 12''$
$\delta' = +18°\ 3'\ 13''$
$\delta + \delta' = 34°\ 48'\ 25''$
$\delta - \delta' = -\ 1°\ 18'\ 1''$

$\tfrac{1}{2} (\alpha - \alpha') = 8°\ 54'\ 4''$
$\tfrac{1}{2} (\delta + \delta') = 17°\ 24'\ 12''$
$\tfrac{1}{2} (\delta - \delta') = -\ 0°\ 39'\ 0''$

$\tan \tfrac{1}{2} (\alpha - \alpha') = 9.194835$
$\cos \tfrac{1}{2} (\delta + \delta') = 9.979650$
$\operatorname{cosec} \tfrac{1}{2} (\delta - \delta') = \underline{1.945219}\ n$
$\tan N = 1.119704\ n$
$N = 94°\ 20'\ 27''$

$\sin \tfrac{1}{2} (\alpha - \alpha') = 9.189573$
$\cos \tfrac{1}{2} (\delta + \delta') = 9.979650$
$\operatorname{cosec} N = \underline{0.001247}$
$\sin \tfrac{1}{2} D = 9.170470$
$\tfrac{1}{2} D = 8°\ 30'\ 55''$
$D = 17°\ 1'\ 50''$

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1915.

Reduce the observed altitude of Polaris to the true altitude.

Reduce the recorded time of observation to the local sidereal time.

Take out the App. R. A. and App. Decl. of Polaris for the time of observation (pp. 251–262).

Subtract the App. R. A. from the local sidereal time of observation and the remainder is the hour-angle of Polaris.

With this hour-angle as the vertical argument, and the App. Decl. of Polaris as the horizontal argument, take out the correction from Table I and add it to or subtract it from the true altitude, according to its sign.

For other altitudes than 45°, corrections taken from the supplementary table at the bottom of Table I (Table Ia) may be applied when necessary for the degree of accuracy required.

Example.—1915, August 5, at $10^h\ 40^m\ 30^s$ P. M. local mean solar time, in longitude 59° west of Greenwich, suppose the true altitude of Polaris to be 33° 20′ 0″, required the latitude of the place.

	h	m	s
Local astronomical mean time	10	40	30
Reduction from Table III for $10^h\ 40^m\ 30^s$		+ 1	45
Greenwich sidereal time of mean noon, August 5, page 87 .	8	51	49
Reduction from Table III, for longitude (=$3^h\ 56^m$ west, or plus)		+ 0	39
	h	m	s
Sum (having regard to signs) is equal to local sidereal time .	19	34	43
R. A. of Polaris (page 258) for time of observation . . .	1	29	39
	h	m	s
Remainder is equal to hour-angle of Polaris	18	5	4
Decl. of Polaris (page 258) for time of observation 88° 51′ 6″			
	°	′	″
True altitude	+33	20	0
Correction from Table I	− 0	0	50
Correction from Table Ia			−14
	°	′	″
Latitude of the place	+33	18	56

Observations of Polaris for latitude should be made when practicable near the times of upper or of lower culminations (hour-angle 0^h or 12^h). However, at sea, if made near elongation (hour-angle 6^h or 18^h), the hour-angle, and hence the local time, should be known within one minute.

H. A. \ Decl.	88° 51′ 0″		88° 51′ 10″		88° 51′ 20″		88° 51′ 30″		88° 51′ 40″		88° 51′ 50″		Decl. / H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
0 0	−69 0	1	−68 50	1	−68 40	0	−68 30	0	−68 20	0	−68 10	0	24 0
3	68 59	1	68 49	1	68 40	1	68 30	1	68 20	1	68 10	1	23 57
6	68 58	2	68 48	2	68 39	2	68 29	2	68 19	2	68 9	2	54
9	68 56	2	68 46	2	68 37	3	68 27	3	68 17	3	68 7	3	51
12	68 54	3	68 44	3	68 34	3	68 24	3	68 14	3	68 4	3	48
0 15	−68 51	4	−68 41	4	−68 31	4	−68 21	4	−68 11	4	−68 1	4	23 45
18	68 47	5	68 37	5	68 27	5	68 17	5	68 7	5	67 57	5	42
21	68 42	6	68 32	5	68 22	5	68 12	5	68 2	5	67 52	5	39
24	68 36	6	68 27	6	68 17	6	68 7	6	67 57	6	67 47	6	36
27	68 30	7	68 21	7	68 11	7	68 1	7	67 51	7	67 41	7	33
0 30	−68 23	7	−68 14	8	−68 4	8	−67 54	7	−67 44	7	−67 34	7	23 30
33	68 16	8	68 6	8	67 56	8	67 47	8	67 37	8	67 27	8	27
36	68 8	9	67 58	9	67 48	9	67 39	9	67 29	9	67 19	9	24
39	67 59	10	67 49	10	67 39	9	67 30	10	67 20	10	67 10	10	21
42	67 49	11	67 39	10	67 30	11	67 20	10	67 10	10	67 0	10	18
0 45	−67 38	11	−67 29	11	−67 19	11	−67 10	11	−67 0	11	−66 50	11	23 15
48	67 27	12	67 18	12	67 8	12	66 59	12	66 49	12	66 39	12	12
51	67 15	13	67 6	13	66 56	12	66 47	13	66 37	13	66 27	12	9
54	67 2	13	66 53	13	66 44	13	66 34	13	66 24	13	66 15	13	6
0 57	66 49	14	66 40	14	66 31	14	66 21	14	66 11	13	66 2	14	3
1 0	−66 35	14	−66 26	14	−66 17	15	−66 7	14	−65 58	15	−65 48	14	23 0
3	66 21	15	66 12	15	66 2	15	65 53	15	65 43	15	65 34	16	22 57
6	66 6	16	65 57	16	65 47	16	65 38	16	65 28	16	65 18	16	54
9	65 50	17	65 41	17	65 31	17	65 22	17	65 12	16	65 2	16	51
1 12	−65 33		−65 24		−65 14		−65 5		−64 56		−64 46		22 48

TABLE I.

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1915.

Decl. / H. A.	88° 51′ 0″		88° 51′ 10″		88° 51′ 20″		88° 51′ 30″		88° 51′ 40″		88° 51′ 50″		Decl. / H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
1 12	−65 33	18	−65 24	18	−65 14	17	−65 5	17	−64 56	18	−64 46	17	22 48
15	65 15	18	65 6	18	64 57	18	64 48	18	64 38	18	64 29	18	45
18	64 57	18	64 48	18	64 39	19	64 30	19	64 20	18	64 11	19	42
21	64 39	20	64 30	20	64 20	19	64 11	19	64 2	20	63 52	19	39
24	64 19	20	64 10	20	64 1	20	63 52	20	63 42	20	63 33	20	36
1 27	−63 59	20	−63 50	20	−63 41	21	−63 32	21	−63 22	20	−63 13	20	22 33
30	63 39	22	63 30	22	63 20	21	63 11	21	63 2	21	62 53	21	30
33	63 17	22	63 8	22	62 59	22	62 50	22	62 41	22	62 32	22	27
36	62 55	23	62 46	23	62 37	23	62 28	23	62 19	23	62 10	23	24
39	62 32	23	62 23	23	62 14	23	62 5	23	61 56	23	61 47	23	21
1 42	−62 9	24	−62 0	24	−61 51	24	−61 42	24	−61 33	24	−61 24	24	22 18
45	61 45	25	61 36	24	61 27	25	61 18	24	61 9	24	61 0	25	15
48	61 20	25	61 12	26	61 2	25	60 54	25	60 45	25	60 35	25	12
51	60 55	26	60 46	26	60 37	26	60 29	26	60 20	26	60 10	25	9
54	60 29	27	60 20	26	60 11	26	60 3	27	59 54	26	59 45	26	6
1 57	−60 2	27	−59 54	27	−59 45	27	−59 36	27	−59 28	27	−59 19	27	22 3
2 0	59 35	28	59 27	28	59 18	28	59 9	28	59 1	28	58 52	28	22 0
3	59 7	29	58 59	29	58 50	28	58 41	28	58 33	28	58 24	28	21 57
6	58 38	29	58 30	29	58 22	29	58 13	29	58 5	29	57 56	28	54
9	58 9	29	58 1	29	57 53	30	57 44	29	57 36	29	57 28	30	51
2 12	−57 40	31	−57 32	31	−57 23	30	−57 15	30	−57 7	30	−56 58	30	21 48
15	57 9	31	57 1	31	56 53	31	56 45	31	56 37	31	56 28	30	45
18	56 38	31	56 30	31	56 22	31	56 14	31	56 6	31	55 58	31	42
21	56 7	32	55 59	32	55 51	32	55 43	32	55 35	32	55 27	32	39
24	55 35	33	55 27	33	55 19	33	55 11	32	55 3	32	54 55	32	36
2 27	−55 2	33	−54 54	33	−54 46	33	−54 39	33	−54 31	33	−54 23	33	21 33
30	54 29	34	54 21	33	54 13	33	54 6	34	53 58	34	53 50	34	30
33	53 55	35	53 48	35	53 40	34	53 32	34	53 24	34	53 16	34	27
36	53 20	34	53 13	34	53 6	35	52 58	35	52 50	34	52 42	34	24
39	52 46	36	52 39	36	52 31	35	52 23	35	52 16	35	52 8	35	21
2 42	−52 10	36	−52 3	36	−51 56	36	−51 48	36	−51 41	36	−51 33	35	21 18
45	51 34	36	51 27	36	51 20	37	51 12	36	51 5	36	50 58	36	15
48	50 58	37	50 51	37	50 43	37	50 36	37	50 29	37	50 22	37	12
51	50 21	38	50 14	38	50 6	37	49 59	37	49 52	37	49 45	37	9
54	49 43	38	49 36	38	49 29	38	49 22	38	49 15	38	49 8	38	6
2 57	−49 5	38	−48 58	38	−48 51	38	−48 44	38	−48 37	38	−48 30	38	21 3
3 0	48 27	39	48 20	39	48 13	39	48 6	39	47 59	39	47 52	39	21 0
3	47 48	40	47 41	40	47 34	39	47 27	39	47 20	39	47 13	39	20 57
6	47 8	40	47 1	39	46 55	40	46 48	40	46 41	40	46 34	39	54
9	46 28	41	46 22	41	46 15	41	46 8	40	46 1	40	45 55	40	51
3 12	−45 47	41	−45 41	41	−45 34	41	−45 28	41	−45 21	41	−45 15	41	20 48
15	45 6	42	45 0	42	44 53	41	44 47	41	44 40	41	44 34	41	45
18	44 24	42	44 18	41	44 12	42	44 6	42	43 59	41	43 53	41	42
21	43 42	42	43 37	43	43 30	42	43 24	42	43 18	42	43 12	42	39
24	43 0	43	42 54	42	42 48	43	42 42	43	42 36	43	42 30	43	36
3 27	−42 17	43	−42 12	44	−42 5	43	−41 59	43	−41 53	43	−41 47	43	20 33
30	41 34	44	41 28	43	41 22	43	41 16	43	41 10	43	41 4	43	30
33	40 50	44	40 45	44	40 39	44	40 33	44	40 27	43	40 21	43	27
36	40 6	45	40 1	45	39 55	44	39 49	44	39 44	44	39 38	44	24
39	39 21	45	39 16	45	39 11	45	39 5	45	39 00	45	38 54	45	21
3 42	−38 36	45	−38 31	45	−38 26	45	−38 20	45	−38 15	45	−38 9	45	20 18
45	37 51	46	37 46	46	37 41	46	37 35	45	37 30	45	37 24	45	15
48	37 5	46	37 0	46	36 55	46	36 50	46	36 45	46	36 39	45	12
51	36 19	46	36 14	46	36 9	46	36 4	46	35 59	46	35 54	46	9
54	35 33	47	35 28	47	35 23	47	35 18	47	35 13	46	35 8	46	6
3 57	−34 46	47	−34 41	47	−34 36	47	−34 31	47	−34 27	47	−34 22	47	20 3
4 0	33 59	48	33 54	47	33 49	47	33 44	47	33 40	47	33 35	47	20 0
3	33 11	48	33 7	48	33 2	48	32 57	47	32 53	48	32 48	48	19 57
6	32 23	48	32 19	48	32 14	48	32 10	48	32 5	48	32 0	47	54
4 9	−31 35		−31 31		−31 26		−31 22		−31 17		−31 13		19 51

TABLE I.

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1915.

Decl. / H. A.	88° 51′ 0″		88° 51′ 10″		88° 51′ 20″		88° 51′ 30″		88° 51′ 40″		88° 51′ 50″		Decl. / H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
4 9	−31 35	49	−31 31	49	−31 26	48	−31 22	48	−31 17	48	−31 13	48	19 51
12	30 46	48	30 42	48	30 38	49	30 34	49	30 29	48	30 25	49	48
15	29 58	49	29 54	49	29 49	49	29 45	49	29 41	49	29 36	49	45
18	29 9	50	29 5	50	29 0	49	28 56	49	28 52	49	28 47	48	42
21	28 19	50	28 15	49	28 11	49	28 7	49	28 3	49	27 59	49	39
4 24	−27 29	50	−27 26	50	−27 22	50	−27 18	50	−27 14	50	−27 10	50	19 36
27	26 39	51	26 36	51	26 32	50	26 28	50	26 24	50	26 20	49	33
30	25 48	50	25 45	50	25 42	51	25 38	50	25 34	50	25 31	50	30
33	24 58	51	24 55	51	24 51	50	24 48	51	24 44	50	24 41	50	27
36	24 7	51	24 4	51	24 1	51	23 57	50	23 54	51	23 51	51	24
4 39	−23 16	52	−23 13	51	−23 10	51	−23 7	51	−23 3	51	−23 0	51	19 21
42	22 24	51	22 22	51	22 19	52	22 16	51	22 12	51	22 9	51	18
45	21 33	52	21 31	52	21 27	51	21 25	52	21 21	51	21 18	51	15
48	20 41	52	20 39	52	20 36	52	20 33	51	20 30	51	20 27	51	12
51	19 49	52	19 47	52	19 44	52	19 42	52	19 39	52	19 36	52	9
4 54	−18 57	52	−18 55	52	−18 52	52	−18 50	52	−18 47	52	−18 44	51	19 6
4 57	18 5	53	18 3	53	18 0	52	17 58	52	17 55	52	17 53	52	3
5 0	17 12	52	17 10	52	17 8	52	17 6	53	17 3	52	17 1	52	19 0
3	16 20	53	16 18	53	16 16	53	16 13	52	16 11	52	16 9	52	18 57
6	15 27	53	15 25	53	15 23	53	15 21	53	15 19	52	15 17	53	54
5 9	−14 34	53	−14 32	53	−14 30	53	−14 28	52	−14 27	53	−14 24	52	18 51
12	13 41	53	13 39	53	13 37	53	13 36	53	13 34	53	13 32	53	48
15	12 48	54	12 46	53	12 44	53	12 43	53	12 41	53	12 39	53	45
18	11 54	54	11 53	54	11 51	53	11 50	54	11 48	53	11 46	53	42
21	11 0	53	10 59	53	10 58	54	10 56	53	10 55	53	10 53	53	39
5 24	−10 7	54	−10 6	54	−10 4	53	−10 3	53	−10 2	53	−10 0	53	18 36
27	9 13	54	9 12	54	9 11	54	9 10	54	9 9	53	9 7	53	33
30	8 19	53	8 18	53	8 17	53	8 16	53	8 16	54	8 14	53	30
33	7 26	54	7 25	54	7 24	54	7 23	54	7 22	54	7 21	53	27
36	6 32	54	6 31	54	6 30	54	6 29	54	6 28	53	6 28	54	24
5 39	− 5 38	55	− 5 37	54	− 5 36	54	− 5 35	53	− 5 35	54	− 5 34	53	18 21
42	4 43	54	4 43	54	4 42	54	4 42	54	4 41	53	4 41	53	18
45	3 49	54	3 49	54	3 48	53	3 48	54	3 48	54	3 48	54	15
48	2 55	54	2 55	54	2 55	54	2 54	53	2 54	54	2 54	54	12
51	2 1	55	2 1	54	2 1	54	2 1	54	2 0	53	2 0	54	9
5 54	− 1 6	54	− 1 7	54	− 1 7	54	− 1 7	54	− 1 7	54	− 1 6	53	18 6
5 57	− 0 12	54	− 0 13	54	− 0 13	54	− 0 13	54	− 0 13	54	− 0 13	54	3
6 0	+ 0 42	53	+ 0 41	54	+ 0 41	54	+ 0 41	54	+ 0 41	53	+ 0 41	53	18 0
3	1 35	54	1 35	54	1 35	54	1 35	53	1 34	54	1 34	54	17 57
6	2 29	55	2 29	54	2 29	54	2 28	54	2 28	54	2 28	53	54
6 9	+ 3 24	54	+ 3 23	54	+ 3 23	54	+ 3 22	54	+ 3 22	53	+ 3 21	54	17 51
12	4 18	54	4 17	54	4 17	53	4 16	53	4 15	54	4 15	53	48
15	5 12	54	5 11	54	5 10	54	5 9	54	5 9	53	5 8	53	45
18	6 6	54	6 5	54	6 4	54	6 3	53	6 2	54	6 1	53	42
21	7 0	54	6 59	54	6 58	53	6 56	54	6 56	53	6 54	54	39
6 24	+ 7 54	53	+ 7 53	53	+ 7 51	54	+ 7 50	53	+ 7 49	53	+ 7 48	53	17 36
27	8 47	54	8 46	54	8 45	53	8 43	54	8 42	53	8 41	53	33
30	9 41	54	9 40	53	9 38	54	9 37	53	9 35	53	9 34	53	30
33	10 35	53	10 33	53	10 32	53	10 30	53	10 28	53	10 27	52	27
36	11 28	54	11 26	54	11 25	53	11 23	53	11 21	53	11 19	53	24
6 39	+12 22	54	+12 20	53	+12 18	52	+12 16	52	+12 14	53	+12 12	53	17 21
42	13 16	53	13 13	53	13 10	53	13 8	53	13 7	52	13 5	52	18
45	14 9	52	14 6	52	14 3	53	14 1	53	13 59	53	13 57	52	15
48	15 1	53	14 58	53	14 56	52	14 54	52	14 52	52	14 49	52	12
51	15 54	52	15 51	53	15 48	53	15 46	52	15 44	52	15 41	52	9
6 54	+16 46	52	+16 44	52	+16 41	52	+16 38	52	+16 36	52	+16 33	52	17 6
6 57	17 38	52	17 36	52	17 33	52	17 30	52	17 28	51	17 25	51	3
7 0	18 30	52	18 28	52	18 25	51	18 22	52	18 19	52	18 16	52	17 0
3	19 22	52	19 20	51	19 16	52	19 14	51	19 11	51	19 8	51	16 57
7 6	+20 14		+20 11		+20 8		+20 5		+20 2		+19 59		16 54

TABLE I.

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1915.

Decl. H. A.	88° 51′ 0″		88° 51′ 10″		88° 51′ 20″		88° 51′ 30″		88° 51′ 40″		88° 51′ 50″		Decl. H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
7 6	+20 14	52	+20 11	52	+20 8	51	+20 5	51	+20 2	51	+19 59	51	16 54
9	21 6	51	21 3	51	20 59	51	20 56	51	20 53	51	20 50	51	51
12	21 57	51	21 54	51	21 50	51	21 47	51	21 44	51	21 41	50	48
15	22 48	51	22 45	51	22 41	51	22 38	50	22 35	50	22 31	50	45
18	23 39	51	23 36	50	23 32	50	23 28	51	23 25	50	23 21	50	42
7 21	+24 30	50	+24 26	50	+24 22	50	+24 19	50	+24 15	50	+24 11	50	16 39
24	25 20	50	25 16	50	25 12	50	25 9	49	25 5	50	25 1	50	36
27	26 10	50	26 6	50	26 2	50	25 58	50	25 55	49	25 51	49	33
30	27 0	49	26 56	49	26 52	49	26 48	49	26 44	49	26 40	50	30
33	27 49	49	27 45	49	27 41	49	27 37	49	27 33	49	27 30	48	27
7 36	+28 38	49	+28 34	49	+28 30	49	+28 26	48	+28 22	48	+28 18	48	16 24
39	29 27	49	29 23	49	29 19	48	29 14	49	29 10	48	29 6	48	21
42	30 16	48	30 12	48	30 7	48	30 3	48	29 58	48	29 54	48	18
45	31 4	48	31 0	48	30 55	48	30 51	47	30 46	48	30 42	47	15
48	31 52	48	31 48	48	31 43	48	31 38	48	31 34	47	31 29	47	12
7 51	+32 40	47	+32 36	47	+32 31	47	+32 26	47	+32 21	47	+32 16	47	16 9
54	33 27	47	33 23	47	33 18	47	33 13	46	33 8	47	33 3	47	6
7 57	34 14	47	34 10	46	34 5	46	33 59	47	33 55	46	33 50	46	3
8 0	35 1	46	34 56	46	34 51	46	34 46	46	34 41	46	34 36	45	16 0
3	35 47	46	35 42	46	35 37	46	35 32	45	35 27	45	35 21	46	15 57
8 6	+36 33	46	+36 28	46	+36 23	45	+36 17	45	+36 12	45	+36 7	45	15 54
9	37 19	45	37 14	45	37 8	45	37 2	45	36 57	45	36 52	44	51
12	38 4	45	37 59	44	37 53	44	37 47	45	37 42	44	37 36	44	48
15	38 49	44	38 43	45	38 37	45	38 32	44	38 26	44	38 20	44	45
18	39 33	44	39 28	43	39 22	43	39 16	43	39 10	44	39 4	44	42
8 21	+40 17	43	+40 11	44	+40 5	44	+39 59	44	+39 54	43	+39 48	43	15 39
24	41 0	43	40 55	43	40 49	43	40 43	43	40 37	43	40 31	42	36
27	41 43	43	41 38	42	41 32	42	41 26	42	41 20	42	41 13	42	33
30	42 26	42	42 20	43	42 14	42	42 8	42	42 2	42	41 55	42	30
33	43 8	42	43 3	41	42 56	42	42 50	41	42 44	41	42 37	42	27
8 36	+43 50	42	+43 44	42	+43 38	41	+43 31	41	+43 25	41	+43 19	41	15 24
39	44 32	40	44 26	40	44 19	41	44 12	41	44 6	40	44 0	40	21
42	45 12	41	45 6	41	45 0	40	44 53	40	44 46	40	44 40	40	18
45	45 53	40	45 47	40	45 40	40	45 33	40	45 26	40	45 20	39	15
48	46 33	40	46 27	39	46 20	39	46 13	39	46 6	39	45 59	39	12
8 51	+47 13	39	+47 6	39	+46 59	39	+46 52	39	+46 45	39	+46 38	39	15 9
54	47 52	38	47 45	38	47 38	38	47 31	38	47 24	38	47 17	38	6
8 57	48 30	38	48 23	38	48 16	38	48 9	38	48 2	38	47 55	38	3
9 0	49 8	38	49 1	38	48 54	37	48 47	37	48 40	37	48 33	37	15 0
3	49 46	37	49 39	37	49 31	37	49 24	37	49 17	37	49 10	36	14 57
9 6	+50 23	36	+50 16	36	+50 8	36	+50 1	36	+49 54	36	+49 46	36	14 54
9	50 59	36	50 52	36	50 44	36	50 37	36	50 30	35	50 22	36	51
12	51 35	35	51 28	35	51 20	35	51 13	35	51 5	35	50 58	35	48
15	52 10	35	52 3	35	51 55	35	51 48	35	51 40	35	51 33	34	45
18	52 45	34	52 38	34	52 30	34	52 23	34	52 15	34	52 7	34	42
9 21	+53 19	34	+53 12	34	+53 4	34	+52 57	33	+52 49	34	+52 41	34	14 39
24	53 53	33	53 46	33	53 38	33	53 30	33	53 23	33	53 15	33	36
27	54 26	33	54 19	33	54 11	33	54 3	33	53 56	32	53 48	32	33
30	54 59	33	54 52	32	54 44	32	54 36	32	54 28	32	54 20	32	30
33	55 32	32	55 24	32	55 16	31	55 8	31	55 0	31	54 52	31	27
9 36	+56 4	31	+55 56	31	+55 47	31	+55 39	31	+55 31	31	+55 23	31	14 24
39	56 35	30	56 27	30	56 18	31	56 10	30	56 2	30	55 54	30	21
42	57 5	30	56 57	30	56 49	30	56 40	30	56 32	30	56 24	29	18
45	57 35	29	57 27	29	57 19	29	57 10	29	57 2	29	56 53	29	15
48	58 4	29	57 56	29	57 48	28	57 39	29	57 31	28	57 22	29	12
9 51	+58 33	28	+58 25	28	+58 16	28	+58 8	28	+57 59	28	+57 51	28	14 9
54	59 1	27	58 53	27	58 44	28	58 36	27	58 27	27	58 19	27	6
9 57	59 28	27	59 20	27	59 12	27	59 3	27	58 54	27	58 46	26	3
10 0	59 55	26	59 47	26	59 39	26	59 30	26	59 21	26	59 12	26	14 0
10 3	+60 21		+60 13		+60 5		+59 56		+59 47		+59 38		13 57

FOR FINDING THE LATITUDE BY AN OBSERVED ALTITUDE OF POLARIS, 1915.

Decl. / H. A.	88° 51′ 0″		88° 51′ 10″		88° 51′ 20″		88° 51′ 30″		88° 51′ 40″		88° 51′ 50″		Decl. / H. A.
h m	′ ″		′ ″		′ ″		′ ″		′ ″		′ ″		h m
10 3	+60 21	26	+60 13	26	+60 5	25	+59 56	25	+59 47	26	+59 38	26	13 57
6	60 47	25	60 39	25	60 30	25	60 21	25	60 13	24	60 4	24	54
9	61 12	25	61 4	24	60 55	24	60 46	24	60 37	25	60 28	25	51
12	61 37	24	61 28	24	61 19	24	61 10	24	61 2	23	60 53	23	48
15	62 1	23	61 52	23	61 43	23	61 34	23	61 25	23	61 16	23	45
10 18	+62 24	23	+62 15	23	+62 6	23	+61 57	22	+61 48	23	+61 39	23	13 42
21	62 47	22	62 38	22	62 29	22	62 19	22	62 11	21	62 2	21	39
24	63 9	21	63 0	21	62 51	21	62 41	21	62 32	21	62 23	21	36
27	63 30	21	63 21	21	63 12	21	63 2	21	62 53	21	62 44	21	33
30	63 51	20	63 42	20	63 33	20	63 23	20	63 14	20	63 5	19	30
10 33	+64 11	19	+64 2	19	+63 53	19	+63 43	19	+63 34	19	+63 24	20	13 27
36	64 30	19	64 21	19	64 12	18	64 2	19	63 53	19	63 44	18	24
39	64 49	18	64 40	18	64 30	18	64 21	18	64 12	17	64 2	18	21
42	65 7	18	64 58	17	64 48	17	64 39	17	64 29	18	64 20	17	18
45	65 25	17	65 15	17	65 5	17	64 56	17	64 47	16	64 37	17	15
10 48	+65 42	16	+65 32	16	+65 22	16	+65 13	16	+65 3	16	+64 54	16	13 12
51	65 58	15	65 48	15	65 38	15	65 29	15	65 19	15	65 10	15	9
54	66 13	15	66 3	15	65 53	15	65 44	15	65 34	15	65 25	15	6
10 57	66 28	14	66 18	14	66 8	14	65 59	14	65 49	14	65 40	14	3
11 0	66 42	13	66 32	13	66 22	13	66 13	13	66 3	13	65 54	13	13 0
11 3	+66 55	13	+66 45	13	+66 35	13	+66 26	13	+66 16	13	+66 7	12	12 57
6	67 8	12	66 58	12	66 48	12	66 39	12	66 29	12	66 19	12	54
9	67 20	11	67 10	12	67 0	12	66 51	11	66 41	11	66 31	11	51
12	67 31	11	67 22	10	67 12	11	67 2	11	66 52	11	66 42	11	48
15	67 42	10	67 32	10	67 23	10	67 13	10	67 3	10	66 53	10	45
11 18	+67 52	9	+67 42	10	+67 33	9	+67 23	9	+67 13	9	+67 3	9	12 42
21	68 1	9	67 52	8	67 42	8	67 32	8	67 22	8	67 12	8	39
24	68 10	8	68 0	8	67 50	8	67 40	8	67 30	8	67 20	8	36
27	68 18	7	68 8	7	67 58	7	67 48	7	67 38	8	67 28	8	33
30	68 25	7	68 15	7	68 5	7	67 55	7	67 46	6	67 36	6	30
11 33	+68 32	6	+68 22	6	+68 12	6	+68 2	6	+67 52	6	+67 42	6	12 27
36	68 38	5	68 28	5	68 18	5	68 8	5	67 58	5	67 48	5	24
39	68 43	4	68 33	5	68 23	5	68 13	4	68 3	5	67 53	5	21
42	68 47	4	68 38	3	68 28	4	68 17	4	68 8	3	67 58	3	18
45	68 51	3	68 41	3	68 32	3	68 21	3	68 11	3	68 1	3	15
11 48	+68 54	2	+68 44	3	+68 35	2	+68 24	3	+68 14	3	+68 4	3	12 12
51	68 56	2	68 47	2	68 37	2	68 27	2	68 17	2	68 7	2	9
54	68 58	1	68 49	0	68 39	1	68 29	1	68 19	1	68 9	1	6
11 57	68 59	1	68 49	1	68 40	0	68 30	0	68 20	0	68 10	0	3
12 0	+69 0		+68 50		+68 40		+68 30		+68 20		+68 10		12 0

• TABLE Ia.

Table I has been computed for an altitude of 45°. For other altitudes, corrections taken from the following table may be applied when the desired degree of accuracy requires it.

H. A.	Altitude.	10°	20°	30°	40°	50°	60°	70°	Altitude.	H. A.
h	h	″	″	″	″	″	″	″	h	h
0	12	0	0	0	0	0	0	0	12	24
1	11	− 2	− 2	− 1	0	0	+ 2	+ 5	13	23
2	10	8	7	4	−2	+2	8	18	14	22
3	9	17	13	9	3	4	15	36	15	21
4	8	25	20	13	5	6	23	54	16	20
5	7	32	24	16	6	7	28	67	17	19
6	6	−34	−26	−17	−7	+8	+30	+72	18	18

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.830	0 19.659	0 29.489	0 39.318	0 49.148	0 58.977	1 8.807	0	0.000
1	0 0.164	0 9.993	0 19.823	0 29.653	0 39.482	0 49.312	0 59.141	1 8.971	1	0.003
2	0 0.328	0 10.157	0 19.987	0 29.816	0 39.646	0 49.475	0 59.305	1 9.135	2	0.005
3	0 0.491	0 10.321	0 20.151	0 29.980	0 39.810	0 49.639	0 59.469	1 9.298	3	0.008
4	0 0.655	0 10.485	0 20.314	0 30.144	0 39.974	0 49.803	0 59.633	1 9.462	4	0.011
5	0 0.819	0 10.649	0 20.478	0 30.308	0 40.137	0 49.967	0 59.796	1 9.626	5	0.014
6	0 0.983	0 10.813	0 20.642	0 30.472	0 40.301	0 50.131	0 59.960	1 9.790	6	0.016
7	0 1.147	0 10.976	0 20.806	0 30.635	0 40.465	0 50.295	1 0.124	1 9.954	7	0.019
8	0 1.311	0.11.140	0 20.970	0 30.799	0 40.629	0 50.458	1 0.288	1 10.118	8	0.022
9	0 1.474	0 11.304	0 21.134	0 30.963	0 40.793	0 50.622	1 0.452	1 10.281	9	0.025
10	0 1.638	0 11.468	0 21.297	0 31.127	0 40.956	0 50.786	1 0.616	1 10.445	10	0.027
11	0 1.802	0 11.632	0 21.461	0 31.291	0 41.120	0 50.950	1 0.779	1 10.609	11	0.030
12	0 1.966	0 11.795	0 21.625	0 31.455	0 41.284	0 51.114	1 0.943	1 10.773	12	0.033
13	0 2.130	0 11.959	0 21.789	0 31.618	0 41.448	0 51.278	1 1.107	1 10.937	13	0.035
14	0 2.294	0 12.123	0 21.953	0 31.782	0 41.612	0 51.441	1 1.271	1 11.100	14	0.038
15	0 2.457	0 12.287	0 22.117	0 31.946	0 41.776	0 51.605	1 1.435	1 11.264	15	0.041
16	0 2.621	0 12.451	0 22.280	0 32.110	0 41.939	0 51.769	1 1.599	1 11.428	16	0.044
17	0 2.785	0 12.615	0 22.444	0 32.274	0 42.103	0 51.933	1 1.762	1 11.592	17	0.046
18	0 2.949	0 12.778	0 22.608	0 32.438	0 42.267	0 52.097	1 1.926	1 11.756	18	0.049
19	0 3.113	0 12.942	0 22.772	0 32.601	0 42.431	0 52.260	1 2.090	1 11.920	19	0.052
20	0 3.277	0 13.106	0 22.936	0 32.765	0 42.595	0 52.424	1 2.254	1 12.083	20	0.055
21	0 3.440	0 13.270	0 23.099	0 32.929	0 42.759	0 52.588	1 2.418	1 12.247	21	0.057
22	0 3.604	0 13.434	0 23.263	0 33.093	0 42.922	0 52.752	1 2.582	1 12.411	22	0.060
23	0 3.768	0 13.598	0 23.427	0 33.257	0 43.086	0 52.916	1 2.745	1 12.575	23	0.063
24	0 3.932	0 13.761	0 23.591	0 33.420	0 43.250	0 53.080	1 2.909	1 12.739	24	0.066
25	0 4.096	0 13.925	0 23.755	0 33.584	0 43.414	0 53.243	1 3.073	1 12.903	25	0.068
26	0 4.259	0 14.089	0 23.919	0 33.748	0 43.578	0 53.407	1 3.237	1 13.066	26	0.071
27	0 4.423	0 14.253	0 24.082	0 33.912	0 43.742	0 53.571	1 3.401	1 13.230	27	0.074
28	0 4.587	0 14.417	0 24.246	0 34.076	0 43.905	0 53.735	1 3.564	1 13.394	28	0.076
29	0 4.751	0 14.581	0 24.410	0 34.240	0 44.069	0 53.899	1 3.728	1 13.558	29	0.079
30	0 4.915	0 14.744	0 24.574	0 34.403	0 44.233	0 54.063	1 3.892	1 13.722	30	0.082
31	0 5.079	0 14.908	0 24.738	0 34.567	0 44.397	0 54.226	1 4.056	1 13.886	31	0.085
32	0 5.242	0 15.072	0 24.902	0 34.731	0 44.561	0 54.390	1 4.220	1 14.049	32	0.087
33	0 5.406	0 15.236	0 25.065	0 34.895	0 44.724	0 54.554	1 4.384	1 14.213	33	0.090
34	0 5.570	0 15.400	0 25.229	0 35.059	0 44.888	0 54.718	1 4.547	1 14.377	34	0.093
35	0 5.734	0 15.563	0 25.393	0 35.223	0 45.052	0 54.882	1 4.711	1 14.541	35	0.096
36	0 5.898	0 15.727	0 25.557	0 35.386	0 45.216	0 55.046	1 4.875	1 14.705	36	0.098
37	0 6.062	0 15.891	0 25.721	0 35.550	0 45.380	0 55.209	1 5.039	1 14.868	37	0.101
38	0 6.225	0 16.055	0 25.885	0 35.714	0 45.544	0 55.373	1 5.203	1 15.032	38	0.104
39	0 6.389	0 16.219	0 26.048	0 35.878	0 45.707	0 55.537	1 5.367	1 15.196	39	0.106
40	0 6.553	0 16.383	0 26.212	0 36.042	0 45.871	0 55.701	1 5.530	1 15.360	40	0.109
41	0 6.717	0 16.546	0 26.376	0 36.206	0 46.035	0 55.865	1 5.694	1 15.524	41	0.112
42	0 6.881	0 16.710	0 26.540	0 36.369	0 46.199	0 56.028	1 5.858	1 15.688	42	0.115
43	0 7.045	0 16.874	0 26.704	0 36.533	0 46.363	0 56 192	1 6.022	1 15.851	43	0.117
44	0 7.208	0 17.038	0 26.867	0 36.697	0 46.527	0 56.356	1 6.186	1 16.015	44	0.120
45	0 7.372	0 17.202	0 27.031	0 36.861	0 46.690	0 56.520	1 6.350	1 16.179	45	0.123
46	0 7.536	0 17.366	0 27.195	0 37.025	0 46.854	0 56.684	1 6.513	1 16.343	46	0.126
47	0 7.700	0 17.529	0 27.359	0 37.188	0 47.018	0 56.848	1 6.677	1 16.507	47	0.128
48	0 7.864	0 17.693	0 27.523	0 37.352	0 47.182	0 57.011	1 6.841	1 16.671	48	0.131
49	0 8.027	0 17.857	0 27.687	0 37.516	0 47.346	0 57.175	1 7.005	1 16.834	49	0.134
50	0 8.191	0 18.021	0 27.850	0 37.680	0 47.510	0 57.339	1 7.169	1 16.998	50	0.137
51	0 8.355	0 18.185	0 28.014	0 37.844	0 47 673	0 57.503	1 7.332	1 17.162	51	0.139
52	0 8.519	0 18.349	0 28.178	0 38.008	0 47.837	0 57.667	1 7.496	1 17.326	52	0.142
53	0 8.683	0 18.512	0 28.342	0 38.171	0 48.001	0 57.831	1 7.660	1 17.490	53	0.145
54	0 8.847	0 18.676	0 28.506	0 38.335	0 48.165	0 57.994	1 7.824	1 17.654	54	0.147
55	0 9.010	0 18.840	0 28.670	0 38.499	0 48.329	0 58.158	1 7.988	1 17.817	55	0.150
56	0 9.174	0 19.004	0 28.833	0 38.663	0 48.492	0 58.322	1 8.152	1 17.981	56	0.153
57	0 9.338	0 19.168	0 28.997	0 38.827	0 48.656	0 58.486	1 8.315	1 18.145	57	0.156
58	0 9.502	0 19.331	0 29.161	0 38.991	0 48.820	0 58.650	1 8.479	1 18.309	58	0.158
59	0 9.666	0 19.495	0 29.325	0 39.154	0 48.984	0 58.814	1 8.643	1 18.473	59	0.161
Side-	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	For Seconds.	

TABLE II.—SIDEREAL INTO MEAN SOLAR TIME.

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.636	1 28.466	1 38.296	1 48.125	1 57.955	2 7.784	2 17.614	2 27.443	0	0.000
1	1 18.800	1 28.630	1 38.459	1 48.289	1 58.119	2 7.948	2 17.778	2 27.607	1	0.003
2	1 18.964	1 28.794	1 38.623	1 48.453	1 58.282	2 8.112	2 17.941	2 27.771	2	0.005
3	1 19.128	1 28.958	1 38.787	1 48.617	1 58.446	2 8.276	2 18.105	2 27.935	3	0.008
4	1 19.292	1 29.121	1 38.951	1 48.780	1 58.610	2 8.440	2 18.269	2 28.099	4	0.011
5	1 19.456	1 29.285	1 39.115	1 48.944	1 58.774	2 8.603	2 18.433	2 28.263	5	0.014
6	1 19.619	1 29.449	1 39.279	1 49.108	1 58.938	2 8.767	2 18.597	2 28.426	6	0.016
7	1 19.783	1 29.613	1 39.442	1 49.272	1 59.101	2 8.931	2 18.761	2 28.590	7	0.019
8	1 19.947	1 29.777	1 39.606	1 49.436	1 59.265	2 9.095	2 18.924	2 28.754	8	0.022
9	1 20.111	1 29.940	1 39.770	1 49.600	1 59.429	2 9.259	2 19.088	2 28.918	9	0.025
10	1 20.275	1 30.104	1 39.934	1 49.763	1 59.593	2 9.423	2 19.252	2 29.082	10	0.027
11	1 20.439	1 30.268	1 40.098	1 49.927	1 59.757	2 9.586	2 19.416	2 29.245	11	0.030
12	1 20.602	1 30.432	1 40.261	1 50.091	1 59.921	2 9.750	2 19.580	2 29.409	12	0.033
13	1 20.766	1 30.596	1 40.425	1 50.255	2 0.084	2 9.914	2 19.744	2 29.573	13	0.035
14	1 20.930	1 30.760	1 40.589	1 50.419	2 0.248	2 10.078	2 19.907	2 29.737	14	0.038
15	1 21.094	1 30.923	1 40.753	1 50.583	2 0.412	2 10.242	2 20.071	2 29.901	15	0.041
16	1 21.258	1 31.087	1 40.917	1 50.746	2 0.576	2 10.405	2 20.235	2 30.065	16	0.044
17	1 21.422	1 31.251	1 41.081	1 50.910	2 0.740	2 10.569	2 20.399	2 30.228	17	0.046
18	1 21.585	1 31.415	1 41.244	1 51.074	2 0.904	2 10.733	2 20.563	2 30.392	18	0.049
19	1 21.749	1 31.579	1 41.408	1 51.238	2 1.067	2 10.897	2 20.727	2 30.556	19	0.052
20	1 21.913	1 31.743	1 41.572	1 51.402	2 1.231	2 11.061	2 20.890	2 30.720	20	0.055
21	1 22.077	1 31.906	1 41.736	1 51.565	2 1.395	2 11.225	2 21.054	2 30.884	21	0.057
22	1 22.241	1 32.070	1 41.900	1 51.729	2 1.559	2 11.388	2 21.218	2 31.048	22	0.060
23	1 22.404	1 32.234	1 42.064	1 51.893	2 1.723	2 11.552	2 21.382	2 31.211	23	0.063
24	1 22.568	1 32.398	1 42.227	1 52.057	2 1.887	2 11.716	2 21.546	2 31.375	24	0.066
25	1 22.732	1 32.562	1 42 391	1 52.221	2 2.050	2 11.880	2 21.709	2 31.539	25	0.068
26	1 22.896	1 32.726	1 42.555	1 52.385	2 2.214	2 12.044	2 21.873	2 31.703	26	0.071
27	1 23.060	1 32.889	1 42.719	1 52.548	2 2.378	2 12.208	2 22.037	2 31.867	27	0.074
28	1 23.224	1 33.053	1 42.883	1 52.712	2 2.542	2 12.371	2 22.201	2 32.031	28	0.076
29	1 23.387	1 33.217	1 43.047	1 52.876	2 2.706	2 12.535	2 22.365	2 32.194	29	0.079
30	1 23.551	1 33.381	1 43.210	1 53.040	2 2.869	2 12.699	2 22.529	2 32.358	30	0.082
31	1 23.715	1 33.545	1 43.374	1 53.204	2 3.033	2 12.863	2 22.692	2 32.522	31	0.085
32	1 23.879	1 33.708	1 43.538	1 53.368	2 3.197	2 13.027	2 22.856	2 32.686	32	0.087
33	1 24.043	1 33.872	1 43.702	1 53.531	2 3.361	2 13.191	2 23.020	2 32.850	33	0.090
34	1 24.207	1 34.036	1 43.866	1 53.695	2 3.525	2 13.354	2 23.184	2 33.013	34	0.093
35	1 24.370	1 34.200	1 44.029	1 53.859	2 3.689	2 13.518	2 23.348	2 33.177	35	0.096
36	1 24.534	1 34.364	1 44.193	1 54.023	2 3.852	2 13.682	2 23.512	2 33.341	36	0.098
37	1 24.698	1 34.528	1 44.357	1 54.187	2 4.016	2 13.846	2 23.675	2 33.505	37	0.101
38	1 24.862	1 34.691	1 44.521	1 54.351	2 4.180	2 14.010	2 23.839	2 33.669	38	0.104
39	1 25.026	1 34.855	1 44.685	1 54.514	2 4.344	2 14.173	2 24.003	2 33.833	39	0.106
40	1 25.190	1 35.019	1 44.849	1 54.678	2 4.508	2 14.337	2 24.167	2 33.996	40	0.109
41	1 25.353	1 35.183	1 45.012	1 54.842	2 4.672	2 14.501	2 24.331	2 34.160	41	0.112
42	1 25.517	1 35.347	1 45.176	1 55.006	2 4.835	2 14.665	2 24.495	2 34.324	42	0.115
43	1 25.681	1 35.511	1 45.340	1 55.170	2 4.999	2 14.829	2 24.658	2 34.488	43	0.117
44	1 25.845	1 35.674	1 45.504	1 55.333	2 5.163	2 14.993	2 24.822	2 34.652	44	0.120
45	1 26.009	1 35.838	1 45.668	1 55.497	2 5.327	2 15.156	2 24.986	2 34.816	45	0.123
46	1 26.172	1 36.002	1 45.832	1 55.661	2 5.491	2 15.320	2 25.150	2 34.979	46	0.126
47	1 26.336	1 36.166	1 45.995	1 55.825	2 5.655	2 15.484	2 25.314	2 35.143	47	0.128
48	1 26.500	1 36.330	1 46.159	1 55.989	2 5.818	2 15.648	2 25.477	2 35.307	48	0.131
49	1 26.664	1 36.493	1 46.323	1 56.153	2 5.982	2 15.812	2 25.641	2 35.471	49	0.134
50	1 26.828	1 36.657	1 46.487	1 56.316	2 6.146	2 15.976	2 25.805	2 35.635	50	0.137
51	1 26.992	1 36.821	1 46.651	1 56.480	2 6.310	2 16.139	2 25.969	2 35.798	51	0.139
52	1 27.155	1 36.985	1 46.815	1 56.644	2 6.474	2 16.303	2 26.133	2 35.962	52	0.142
53	1 27.319	1 37.149	1 46.978	1 56.808	2 6.637	2 16.467	2 26.297	2 36.126	53	0.145
54	1 27.483	1 37.313	1 47.142	1 56.972	2 6.801	2 16.631	2 26.460	2 36.290	54	0.147
55	1 27.647	1 37.476	1 47.306	1 57.136	2 6.965	2 16.795	2 26.624	2 36.454	55	0.150
56	1 27.811	1 37.640	1 47.470	1 57.299	2 7.129	2 16.959	2 26.788	2 36.618	56	0.153
57	1 27.975	1 37.804	1 47.634	1 57.463	2 7.293	2 17.122	2 26.952	2 36.781	57	0.156
58	1 28.138	1 37.968	1 47.797	1 57.627	2 7.457	2 17.286	2 27.116	2 36.945	58	0.158
59	1 28.302	1 38.132	1 47.961	1 57.791	2 7.620	2 17.450	2 27.280	2 37.109	59	0.161
Sidereal.	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	For Seconds.	

TO BE SUBTRACTED FROM A SIDEREAL TIME INTERVAL.

Sidereal.	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.273	2 47.102	2 56.932	3 6.762	3 16.591	3 26.421	3 36.250	3 46.080	0	0.000
1	2 37.437	2 47.266	2 57.096	3 6.925	3 16.755	3 26.585	3 36.414	3 46.244	1	0.003
2	2 37.601	2 47.430	2 57.260	3 7.089	3 16.919	3 26.748	3 36.578	3 46.407	2	0.005
3	2 37.764	2 47.594	2 57.424	3 7.253	3 17.083	3 26.912	3 36.742	3 46.571	3	0.008
4	2 37.928	2 47.758	2 57.587	3 7.417	3 17.246	3 27.076	3 36.906	3 46.735	4	0.011
5	2 38.092	2 47.922	2 57.751	3 7.581	3 17.410	3 27.240	3 37.069	3 46.899	5	0.014
6	2 38.256	2 48.085	2 57.915	3 7.745	3 17.574	3 27.404	3 37.233	3 47.063	6	0.016
7	2 38.420	2 48.249	2 58.079	3 7.908	3 17.738	3 27.568	3 37.397	3 47.227	7	0.019
8	2 38.584	2 48.413	2 58.243	3 8.072	3 17.902	3 27.731	3 37.561	3 47.390	8	0.022
9	2 38.747	2 48.577	2 58.406	3 8.236	3 18.066	3 27.895	3 37.725	3 47.554	9	0.025
10	2 38.911	2 48.741	2 58.570	3 8.400	3 18.229	3 28.059	3 37.889	3 47.718	10	0.027
11	2 39.075	2 48.905	2 58.734	3 8.564	3 18.393	3 28.223	3 38.052	3 47.882	11	0.030
12	2 39.239	2 49.068	2 58.898	3 8.728	3 18.557	3 28.387	3 38.216	3 48.046	12	0.033
13	2 39.403	2 49.232	2 59.062	3 8.891	3 18.721	3 28.550	3 38.380	3 48.210	13	0.035
14	2 39.566	2 49.396	2 59.226	3 9.055	3 18.885	3 28.714	3 38.544	3 48.373	14	0.038
15	2 39.730	2 49.560	2 59.389	3 9.219	3 19.049	3 28.878	3 38.708	3 48.537	15	0.041
16	2 39.894	2 49.724	2 59.553	3 9.383	3 19.212	3 29.042	3 38.871	3 48.701	16	0.044
17	2 40.058	2 49.888	2 59.717	3 9.547	3 19.376	3 29.206	3 39.035	3 48.865	17	0.046
18	2 40.222	2 50.051	2 59.881	3 9.710	3 19.540	3 29.370	3 39.199	3 49.029	18	0.049
19	2 40.386	2 50.215	3 0.045	3 9.874	3 19.704	3 29.533	3 39.363	3 49.193	19	0.052
20	2 40.549	2 50.379	3 0.209	3 10.038	3 19.868	3 29.697	3 39.527	3 49.356	20	0.055
21	2 40.713	2 50.543	3 0.372	3 10.202	3 20.032	3 29.861	3 39.691	3 49.520	21	0.057
22	2 40.877	2 50.707	3 0.536	3 10.366	3 20.195	3 30.025	3 39.854	3 49.684	22	0.060
23	2 41.041	2 50.870	3 0.700	3 10.530	3 20.359	3 30.189	3 40.018	3 49.848	23	0.063
24	2 41.205	2 51.034	3 0.864	3 10.693	3 20.523	3 30.353	3 40.182	3 50.012	24	0.066
25	2 41.369	2 51.198	3 1.028	3 10.857	3 20.687	3 30.516	3 40.346	3 50.175	25	0.068
26	2 41.532	2 51.362	3 1.192	3 11.021	3 20.851	3 30.680	3 40.510	3 50.339	26	0.071
27	2 41.696	2 51.526	3 1.355	3 11.185	3 21.014	3 30.844	3 40.674	3 50.503	27	0.074
28	2 41.860	2 51.690	3 1.519	3 11.349	3 21.178	3 31.008	3 40.837	3 50.667	28	0.076
29	2 42.024	2 51.853	3 1.683	3 11.513	3 21.342	3 31.172	3 41.001	3 50.831	29	0.079
30	2 42.188	2 52.017	3 1.847	3 11.676	3 21.506	3 31.336	3 41.165	3 50.995	30	0.082
31	2 42.352	2 52.181	3 2.011	3 11.840	3 21.670	3 31.499	3 41.329	3 51.158	31	0.085
32	2 42.515	2 52.345	3 2.174	3 12.004	3 21.834	3 31.663	3 41.493	3 51.322	32	0.087
33	2 42.679	2 52.509	3 2.338	3 12.168	3 21.997	3 31.827	3 41.657	3 51.486	33	0.090
34	2 42.843	2 52.673	3 2.502	3 12.332	3 22.161	3 31.991	3 41.820	3 51.650	34	0.093
35	2 43.007	2 52.836	3 2.666	3 12.496	3 22.325	3 32.155	3 41.984	3 51.814	35	0.096
36	2 43.171	2 53.000	3 2.830	3 12.659	3 22.489	3 32.318	3 42.148	3 51.978	36	0.098
37	2 43.334	2 53.164	3 2.994	3 12.823	3 22.653	3 32.482	3 42.312	3 52.141	37	0.101
38	2 43.498	2 53.328	3 3.157	3 12.987	3 22.817	3 32.646	3 42.476	3 52.305	38	0.104
39	2 43.662	2 53.492	3 3.321	3 13.151	3 22.980	3 32.810	3 42.639	3 52.469	39	0.106
40	2 43.826	2 53.656	3 3.485	3 13.315	3 23.144	3 32.974	3 42.803	3 52.633	40	0.109
41	2 43.990	2 53.819	3 3.649	3 13.478	3 23.308	3 33.138	3 42.967	3 52.797	41	0.112
42	2 44.154	2 53.983	3 3.813	3 13.642	3 23.472	3 33.301	3 43.131	3 52.961	42	0.115
43	2 44.317	2 54.147	3 3.977	3 13.806	3 23.636	3 33.465	3 43.295	3 53.124	43	0.117
44	2 44.481	2 54.311	3 4.140	3 13.970	3 23.800	3 33.629	3 43.459	3 53.288	44	0.120
45	2 44.645	2 54.475	3 4.304	3 14.134	3 23.963	3 33.793	3 43.622	3 53.452	45	0.123
46	2 44.809	2 54.638	3 4.468	3 14.298	3 24.127	3 33.957	3 43.786	3 53.616	46	0.126
47	2 44.973	2 54.802	3 4.632	3 14.461	3 24.291	3 34.121	3 43.950	3 53.780	47	0.128
48	2 45.137	2 54.966	3 4.796	3 14.625	3 24.455	3 34.284	3 44.114	3 53.943	48	0.131
49	2 45.300	2 55.130	3 4.960	3 14.789	3 24.619	3 34.448	3 44.278	3 54.107	49	0.134
50	2 45.464	2 55.294	3 5.123	3 14.953	3 24.782	3 34.612	3 44.442	3 54.271	50	0.137
51	2 45.628	2 55.458	3 5.287	3 15.117	3 24.946	3 34.776	3 44.605	3 54.435	51	0.139
52	2 45.792	2 55.621	3 5.451	3 15.281	3 25.110	3 34.940	3 44.769	3 54.599	52	0.142
53	2 45.956	2 55.785	3 5.615	3 15.444	3 25.274	3 35.104	3 44.933	3 54.763	53	0.145
54	2 46.120	2 55.949	3 5.779	3 15.608	3 25.438	3 35.267	3 45.097	3 54.926	54	0.147
55	2 46.283	2 56.113	3 5.942	3 15.772	3 25.602	3 35.431	3 45.261	3 55.090	55	0.150
56	2 46.447	2 56.277	3 6.106	3 15.936	3 25.765	3 35.595	3 45.425	3 55.254	56	0.153
57	2 46.611	2 56.441	3 6.270	3 16.100	3 25.929	3 35.759	3 45.588	3 55.418	57	0.156
58	2 46.775	2 56.604	3 6.434	3 16.264	3 26.093	3 35.923	3 45.752	3 55.582	58	0.158
59	2 46.939	2 56.768	3 6.598	3 16.427	3 26.257	3 36.086	3 45.916	3 55.746	59	0.161
Sidereal.	16^h	17^h	18^h	19^h	20^h	21^h	22^h	23^h	For Seconds.	

TABLE III.—MEAN SOLAR INTO SIDEREAL TIME.

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	0 0.000	0 9.856	0 19.713	0 29.569	0 39.426	0 49.282	0 59.139	1 8.995	0	0.000
1	0 0.164	0 10.021	0 19.877	0 29.734	0 39.590	0 49.447	0 59.303	1 9.160	1	0.003
2	0 0.329	0 10.185	0 20.041	0 29.898	0 39.754	0 49.611	0 59.467	1 9.324	2	0.005
3	0 0.493	0 10.349	0 20.206	0 30.062	0 39.919	0 49.775	0 59.632	1 9.488	3	0.008
4	0 0.657	0 10.514	0 20.370	0 30.227	0 40.083	0 49.939	0 59.796	1 9.652	4	0.011
5	0 0.821	0 10.678	0 20.534	0 30.391	0 40.247	0 50.104	0 59.960	1 9.817	5	0.014
6	0 0.986	0 10.842	0 20.699	0 30.555	0 40.412	0 50.268	1 0.124	1 9.981	6	0.016
7	0 1.150	0 11.006	0 20.863	0 30.719	0 40.576	0 50.432	1 0.289	1 10.145	7	0.019
8	0 1.314	0 11.171	0 21.027	0 30.884	0 40.740	0 50.597	1 0.453	1 10.310	8	0.022
9	0 1.478	0 11.335	0 21.191	0 31.048	0 40.904	0 50.761	1 0.617	1 10.474	9	0.025
10	0 1.643	0 11.499	0 21.356	0 31.212	0 41.069	0 50.925	1 0.782	1 10.638	10	0.027
11	0 1.807	0 11.663	0 21.520	0 31.376	0 41.233	0 51.089	1 0.946	1 10.802	11	0.030
12	0 1.971	0 11.828	0 21.684	0 31.541	0 41.397	0 51.254	1 1.110	1 10.967	12	0.033
13	0 2.136	0 11.992	0 21.849	0 31.705	0 41.561	0 51.418	1 1.274	1 11.131	13	0.036
14	0 2.300	0 12.156	0 22.013	0 31.869	0 41.726	0 51.582	1 1.439	1 11.295	14	0.038
15	0 2.464	0 12.321	0 22.177	0 32.034	0 41.890	0 51.746	1 1.603	1 11.459	15	0.041
16	0 2.628	0 12.485	0 22.341	0 32.198	0 42.054	0.51.911	1 1.767	1 11.624	16	0.044
17	0 2.793	0 12.649	0 22.506	0 32.362	0 42.219	0 52.075	1 1.932	1 11.788	17	0.047
18	0 2.957	0 12.813	0 22.670	0 32.526	0 42.383	0 52.239	1 2.096	1 11.952	18	0.049
19	0 3.121	0 12.978	0 22.834	0 32.691	0 42.547	0 52.404	1 2.260	1 12.117	19	0.052
20	0 3.285	0 13.142	0 22.998	0 32.855	0 42.711	0 52.568	1 2.424	1 12.281	20	0.055
21	0 3.450	0 13.306	0 23.163	0 33.019	0 42.876	0 52.732	1 2.589	1 12.445	21	0.057
22	0 3.614	0 13.471	0 23.327	0 33.183	0 43.040	0 52.896	1 2.753	1 12.609	22	0.060
23	0 3.778	0 13.635	0 23.491	0 33.348	0 43.204	0 53.061	1 2.917	1 12.774	23	0.063
24	0 3.943	0 13.799	0 23.656	0 33.512	0 43.368	0 53.225	1 3.081	1 12.938	24	0.066
25	0 4.107	0 13.963	0 23.820	0 33.676	0 43.533	0 53.389	1 3.246	1 13.102	25	0.068
26	0 4.271	0 14.128	0 23.984	0 33.841	0 43.697	0 53.554	1 3.410	1 13.266	26	0.071
27	0 4.435	0 14.292	0 24.148	0 34.005	0 43.861	0 53.718	1 3.574	1 13.431	27	0.074
28	0 4.600	0 14.456	0 24.313	0 34.169	0 44.026	0 53.882	1 3.739	1 13.595	28	0.077
29	0 4.764	0 14.620	0 24.477	0 34.333	0 44.190	0 54.046	1 3.903	1 13.759	29	0.079
30	0 4.928	0 14.785	0 24.641	0 34.498	0 44.354	0 54.211	1 4.067	1 13.924	30	0.082
31	0 5.093	0 14.949	0 24.805	0 34.662	0 44.518	0 54.375	1 4.231	1 14.088	31	0.085
32	0 5.257	0 15.113	0 24.970	0 34.826	0 44.683	0 54.539	1 4.396	1 14.252	32	0.088
33	0 5.421	0 15.278	0 25.134	0 34.990	0 44.847	0 54.703	1 4.560	1 14.416	33	0.090
34	0 5.585	0 15.442	0 25.298	0 35.155	0 45.011	0 54.868	1 4.724	1 14.581	34	0.093
35	0 5.750	0 15.606	0 25.463	0 35.319	0 45.176	0 55.032	1 4.888	1 14.745	35	0.096
36	0 5.914	0 15.770	0 25.627	0 35.483	0 45.340	0 55.196	1 5.053	1 14.909	36	0.099
37	0 6.078	0 15.935	0 25.791	0 35.648	0 45.504	0 55.361	1 5.217	1 15.073	37	0.101
38	0 6.242	0 16.099	0 25.955	0 35.812	0 45.668	0 55.525	1 5.381	1 15.238	38	0.104
39	0 6.407	0 16.263	0 26.120	0 35.976	0 45.833	0 55.689	1 5.546	1 15.402	39	0.107
40	0 6.571	0 16.427	0 26.284	0 36.140	0 45.997	0 55.853	1 5.710	1 15.566	40	0.110
41	0 6.735	0 16.592	0 26.448	0 36.305	0 46.161	0 56.018	1 5.874	1 15.731	41	0.112
42	0 6.900	0 16.756	0 26.612	0 36.469	0 46.325	0 56.182	1 6.038	1 15.895	42	0.115
43	0 7.064	0 16.920	0 26.777	0 36.633	0 46.490	0 56.346	1 6.203	1 16.059	43	0.118
44	0 7.228	0 17.085	0 26.941	0 36.798	0 46.654	0 56.510	1 6.367	1 16.223	44	0.120
45	0 7.392	0 17.249	0 27.105	0 36.962	0 46.818	0 56.675	1 6.531	1 16.388	45	0.123
46	0 7.557	0 17.413	0 27.270	0 37.126	0 46.983	0 56.839	1 6.695	1 16.552	46	0.126
47	0 7.721	0 17.577	0 27.434	0 37.290	0 47.147	0 57.003	1 6.860	1 16.716	47	0.129
48	0 7.885	0 17.742	0 27.598	0 37.455	0 47.311	0 57.168	1 7.024	1 16.881	48	0.131
49	0 8.049	0 17.906	0 27.762	0 37.619	0 47.475	0 57.332	1 7.188	1 17.045	49	0.134
50	0 8.214	0 18.070	0 27.927	0 37.783	0 47.640	0 57.496	1 7.353	1 17.209	50	0.137
51	0 8.378	0 18.234	0.28.091	0 37.947	0 47.804	0 57.660	1 7.517	1 17.373	51	0.140
52	0 8.542	0 18.399	0 28.255	0 38.112	0 47.968	0 57.825	1 7.681	1 17.538	52	0.142
53	0 8.707	0 18.563	0 28.420	0 38.276	0 48.132	0 57.989	1 7.845	1 17.702	53	0.145
54	0 8.871	0 18.727	0 28.584	0 38.440	0 48.297	0 58.153	1 8.010	1 17.866	54	0.148
55	0 9.035	0 18.892	0 28.748	0 38.605	0 48.461	0 58.317	1 8.174	1 18.030	55	0.151
56	0 9.199	0 19.056	0 28.912	0 38.769	0 48.625	0 58.482	1 8.338	1 18.195	56	0.153
57	0 9.364	0 19.220	0 29.077	0 38.933	0 48.790	0 58.646	1 8.502	1 18.359	57	0.156
58	0 9.528	0 19.384	0 29.241	0 39.097	0 48.954	0 58.810	1 8.667	1 18.523	58	0.159
59	0 9.692	0 19.549	0 29.405	0 39.262	0 49.118	0 58.975	1 8.831	1 18.688	59	0.162
Mean Solar.	0^h	1^h	2^h	3^h	4^h	5^h	6^h	7^h	For Seconds.	

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	1 18.852	1 28.708	1 38.565	1 48.421	1 58.278	2 8.134	2 17.991	2 27.847	0	0.000
1	1 19.016	1 28.873	1 38.729	1 48.585	1 58.442	2 8.298	2 18.155	2 28.011	1	0.003
2	1 19.180	1 29.037	1 38.893	1 48.750	1 58.606	2 8.463	2 18.319	2 28.176	2	0.005
3	1 19.345	1 29.201	1 39.058	1 48.914	1 58.771	2 8.627	2 18.483	2 28.340	3	0.008
4	1 19.509	1 29.365	1 39.222	1 49.078	1 58.935	2 8.791	2 18.648	2 28.504	4	0.011
5	1 19.673	1 29.530	1 39.386	1 49.243	1 59.099	2 8.956	2 18.812	2 28.668	5	0.014
6	1 19.837	1 29.694	1 39.550	1 49.407	1 59.263	2 9.120	2 18.976	2 28.833	6	0.016
7	1 20.002	1 29.858	1 39.715	1 49.571	1 59.428	2 9.284	2 19.141	2 28.997	7	0.019
8	1 20.166	1 30.022	1 39.879	1 49.735	1 59.592	2 9.448	2 19.305	2 29.161	8	0.022
9	1 20.330	1 30.187	1 40.043	1 49.900	1 59.756	2 9.613	2 19.469	2 29.326	9	0.025
10	1 20.495	1 30.351	1 40.207	1 50.064	1 59.920	2 9.777	2 19.633	2 29.490	10	0.027
11	1 20.659	1 30.515	1 40.372	1 50.228	2 0.085	2 9.941	2 19.798	2 29.654	11	0.030
12	1 20.823	1 30.680	1 40.536	1 50.393	2 0.249	2 10.105	2 19.962	2 29.818	12	0.033
13	1 20.987	1 30.844	1 40.700	1 50.557	2 0.413	2 10.270	2 20.126	2 29.983	13	0.036
14	1 21.152	1 31.008	1 40.865	1 50.721	2 0.578	2 10.434	2 20.290	2 30.147	14	0.038
15	1 21.316	1 31.172	1 41.029	1 50.885	2 0.742	2 10.598	2 20.455	2 30.311	15	0.041
16	1 21.480	1 31.337	1 41.193	1 51.050	2 0.906	2 10.763	2 20.619	2 30.476	16	0.044
17	1 21.644	1 31.501	1 41.357	1 51.214	2 1.070	2 10.927	2 20.783	2 30.640	17	0.047
18	1 21.809	1 31.665	1 41.522	1 51.378	2 1.235	2 11.091	2 20.948	2 30.804	18	0.049
19	1 21.973	1 31.829	1 41.686	1 51.542	2 1.399	2 11.255	2 21.112	2 30.968	19	0.052
20	1 22.137	1 31.994	1 41.850	1 51.707	2 1.563	2 11.420	2 21.276	2 31.133	20	0.055
21	1 22.302	1 32.158	1 42.015	1 51.871	2 1.727	2 11.584	2 21.440	2 31.297	21	0 057
22	1 22.466	1 32.322	1 42.179	1 52.035	2 1.892	2 11.748	2 21.605	2 31.461	22	0.060
23	1 22.630	1 32.487	1 42.343	1 52.200	2 2.056	2 11.912	2 21.769	2 31.625	23	0.063
24	1 22.794	1 32.651	1 42.507	1 52.364	2 2.220	2 12.077	2 21.933	2 31.790	24	0.066
25	1 22.959	1 32.815	1 42.672	1 52.528	2 2.385	2 12.241	2 22.098	2 31.954	25	0.068
26	1 23.123	1 32.979	1 42.836	1 52.692	2 2.549	2 12.405	2 22.262	2 32.118	26	0.071
27	1 23.287	1 33.144	1 43.000	1 52.857	2 2.713	2 12.570	2 22.426	2 32.283	27	0.074
28	1 23.451	1 33 308	1 43.164	1 53.021	2 2.877	2 12.734	2 22.590	2 32.447	28	0.077
29	1 23.616	1 33.472	1 43.329	1 53.185	2 3.042	2 12.898	2 22.755	2 32.611	29	0.079
30	1 23.780	1 33.637	1 43.493	1 53.349	2 3.206	2 13.062	2 22.919	2 32.775	30	0.082
31	1 23.944	1 33.801	1 43.657	1 53.514	2 3.370	2 13.227	2 23.083	2 32.940	31	0.085
32	1 24.109	1 33.965	1 43.822	1 53.678	2 3.534	2 13.391	2 23.247	2 33.104	32	0.088
33	1 24.273	1 34.129	1 43.986	1 53.842	2 3.699	2 13.555	2 23.412	2 33.268	33	0.090
34	1 24.437	1 34.294	1 44.150	1 54.007	2 3.863	2 13.720	2 23.576	2 33.432	34	0.093
35	1 24.601	1 34.458	1 44.314	1 54.171	2 4.027	2 13.884	2 23.740	2 33.597	35	0.096
36	1 24.766	1 34.622	1 44.479	1 54.335	2 4.192	2 14.048	2 23.905	2 33.761	36	0.099
37	1 24.930	1 34.786	1 44.643	1 54.499	2 4.356	2 14.212	2 24.069	2 33.925	37	0.101
38	1 25.094	1 34.951	1 44.807	1 54.664	2 4.520	2 14.377	2 24.233	2 34.090	38	0.104
39	1 25.259	1 35.115	1 44.971	1 54.828	2 4.684	2 14.541	2 24.397	2 34.254	39	0.107
40	1 25.423	1 35.279	1 45.136	1 54.992	2 4.849	2 14.705	2 24.562	2 34.418	40	0.110
41	1 25.587	1 35.444	1 45.300	1 55.156	2 5.013	2 14.869	2 24.726	2 34.582	41	0.112
42	1 25.751	1 35.608	1 45.464	1 55.321	2 5.177	2 15.034	2 24.890	2 34.747	42	0.115
43	1 25.916	1 35.772	1 45.629	1 55.485	2 5.342	2 15.198	2 25.054	2 34.911	43	0.118
44	1 26.080	1 35.936	1 45.793	1 55.649	2 5.506	2 15.362	2 25.219	2 35.075	44	0.120
45	1 26.244	1 36.101	1 45.957	1 55.814	2 5.670	2 15.527	2 25.383	2 35.239	45	0.123
46	1 26.408	1 36.265	1 46.121	1 55.978	2 5.834	2 15.691	2 25.547	2 35.404	46	0.126
47	1 26.573	1 36.429	1 46.286	1 56.142	2 5.999	2 15.855	2 25.712	2 35.568	47	0.129
48	1 26.737	1 36.593	1 46.450	1 56.306	2 6.163	2 16.019	2 25.876	2 35 732	48	0.131
49	1 26.901	1 36.758	1 46.614	1 56.471	2 6.327	2 16.184	2 26.040	2 35.897	49	0.134
50	1 27.066	1 36.922	1 46.778	1 56.635	2 6.491	2 16.348	2 26.204	2 36.061	50	0.137
51	1 27.230	1 37.086	1 46.943	1 56.799	2 6.656	2 16.512	2 26.369	2 36.225	51	0.140
52	1 27.394	1 37.251	1 47.107	1 56.964	2 6.820	2 16.676	2 26.533	2 36.389	52	0.142
53	1 27.558	1 37.415	1 47.271	1 57.128	2 6.984	2 16.841	2 26.697	2 36.554	53	0.145
54	1 27.723	1 37.579	1 47.436	1 57.292	2 7.149	2 17.005	2 26.861	2 36.718	54	0.148
55	1 27.887	1 37.743	1 47.600	1 57.456	2 7.313	2 17.169	2 27.026	2 36.882	55	0.151
56	1 28.051	1 37.908	1 47.764	1 57.621	2 7.477	2 17.334	2 27.190	2 37.047	56	0.153
57	1 28.215	1 38.072	1 47.928	1 57.785	2 7.641	2 17.498	2 27.354	2 37.211	57	0.156
58	1 28.380	1 38.236	1 48.093	1 57.949	2 7.806	2 17.662	2 27.519	2 37.375	58	0.159
59	1 28.544	1 38.400	1 48.257	1 58.113	2 7.970	2 17.826	2 27.683	2 37.539	59	0.162
Mean Solar.	8^h	9^h	10^h	11^h	12^h	13^h	14^h	15^h	For Seconds.	

TO BE ADDED TO A MEAN TIME INTERVAL.

Mean Solar.	16h	17h	18h	19h	20h	21h	22h	23h	For Seconds.	
m	m s	m s	m s	m s	m s	m s	m s	m s	s	s
0	2 37.704	2 47.560	2 57.417	3 7.273	3 17.129	3 26.986	3 36.842	3 46.699	0	0.000
1	2 37.868	2 47.724	2 57.581	3 7.437	3 17.294	3 27.150	3 37.007	3 46.863	1	0.003
2	2 38.032	2 47.889	2 57.745	3 7.602	3 17.458	3 27.315	3 37.171	3 47.027	2	0.005
3	2 38.196	2 48.053	2 57.909	3 7.766	3 17.622	3 27.479	3 37.335	3 47.192	3	0.008
4	2 38.361	2 48.217	2 58.074	3 7.930	3 17.787	3 27.643	3 37.500	3 47.356	4	0.011
5	2 38.525	2 48.381	2 58.238	3 8.094	3 17.951	3 27.807	3 37.664	3 47.520	5	0.014
6	2 38.689	2 48.546	2 58.402	3 8.259	3 18.115	3 27.972	3 37.828	3 47.685	6	0.016
7	2 38.854	2 48.710	2 58.566	3 8.423	3 18.279	3 28.136	3 37.992	3 47.849	7	0.019
8	2 39.018	2 48.874	2 58.731	3 8.587	3 18.444	3 28.300	3 38.157	3 48.013	8	0.022
9	2 39.182	2 49.039	2 58.895	3 8.751	3 18.608	3 28.464	3 38.321	3 48.177	9	0.025
10	2 39.346	2 49.203	2 59.059	3 8.916	3 18.772	3 28.629	3 38.485	3 48.342	10	0.027
11	2 39.511	2 49.367	2 59.224	3 9.080	3 18.937	3 28.793	3 38.649	3 48.506	11	0.030
12	2 39.675	2 49.531	2 59.388	3 9.244	3 19.101	3 28.957	3 38.814	3 48.670	12	0.033
13	2 39.839	2 49.696	2 59.552	3 9.409	3 19.265	3 29.122	3 38.978	3 48.834	13	0.036
14	2 40.003	2 49.860	2 59.716	3 9.573	3 19.429	3 29.286	3 39.142	3 48.999	14	0.038
15	2 40.168	2 50.024	2 59.881	3 9.737	3 19.594	3 29.450	3 39.307	3 49.163	15	0.041
16	2 40.332	2 50.188	3 0.045	3 9.901	3 19.758	3 29.614	3 39.471	3 49.327	16	0.044
17	2 40.496	2 50.353	3 0.209	3 10.066	3 19.922	3 29.779	3 39.635	3 49.492	17	0.047
18	2 40.661	2 50.517	3 0.373	3 10.230	3 20.086	3 29.943	3 39.799	3 49.656	18	0.049
19	2 40.825	2 50.681	3 0.538	3 10.394	3 20.251	3 30.107	3 39.964	3 49.820	19	0.052
20	2 40.989	2 50.846	3 0.702	3 10.559	3 20.415	3 30.271	3 40.128	3 49.984	20	0.055
21	2 41.153	2 51.010	3 0.866	3 10.723	3 20.579	3 30.436	3 40.292	3 50.149	21	0.057
22	2 41.318	2 51.174	3 1.031	3 10.887	3 20.744	3 30.600	3 40.456	3 50.313	22	0.060
23	2 41.482	2 51.338	3 1.195	3 11.051	3 20.908	3 30.764	3 40.621	3 50.477	23	0.063
24	2 41.646	2 51.503	3 1.359	3 11.216	3 21.072	3 30.929	3 40.785	3 50.642	24	0.066
25	2 41.810	2 51.667	3 1.523	3 11.380	3 21.236	3 31.093	3 40.949	3 50.806	25	0.068
26	2 41.975	2 51.831	3 1.688	3 11.544	3 21.401	3 31.257	3 41.114	3 50.970	26	0.071
27	2 42.139	2 51.995	3 1.852	3 11.708	3 21.565	3 31.421	3 41.278	3 51.134	27	0.074
28	2 42.303	2 52.160	3 2.016	3 11.873	3 21.729	3 31.586	3 41.442	3 51.299	28	0.077
29	2 42.468	2 52.324	3 2.181	3 12.037	3 21.893	3 31.750	3 41.606	3 51.463	29	0.079
30	2 42.632	2 52.488	3 2.345	3 12.201	3 22.058	3 31.914	3 41.771	3 51.627	30	0.082
31	2 42.796	2 52.653	3 2.509	3 12.366	3 22.222	3 32.078	3 41.935	3 51.791	31	0.085
32	2 42.960	2 52.817	3 2.673	3 12.530	3 22.386	3 32.243	3 42.099	3 51.956	32	0.088
33	2 43.125	2 52.981	3 2.838	3 12.694	3 22.551	3 32.407	3 42.264	3 52.120	33	0.090
34	2 43.289	2 53.145	3 3.002	3 12.858	3 22.715	3 32.571	3 42.428	3 52.284	34	0.093
35	2 43.453	2 53.310	3 3.166	3 13.023	3 22.879	3 32.736	3 42.592	3 52.449	35	0.096
36	2 43.617	2 53.474	3 3.330	3 13.187	3 23.043	3 32.900	3 42.756	3 52.613	36	0.099
37	2 43.782	2 53.638	3 3.495	3 13.351	3 23.208	3 33.064	3 42.921	3 52.777	37	0.101
38	2 43.946	2 53.803	3 3.659	3 13.515	3 23.372	3 33.228	3 43.085	3 52.941	38	0.104
39	2 44.110	2 53.967	3 3.823	3 13.680	3 23.536	3 33.393	3 43.249	3 53.106	39	0.107
40	2 44.275	2 54.131	3 3.988	3 13.844	3 23.700	3 33.557	3 43.413	3 53.270	40	0.110
41	2 44.439	2 54.295	3 4.152	3 14.008	3 23.865	3 33.721	3 43.578	3 53.434	41	0.112
42	2 44.603	2 54.460	3 4.316	3 14.173	3 24.029	3 33.886	3 43.742	3 53.598	42	0.115
43	2 44.767	2 54.624	3 4.480	3 14.337	3 24.193	3 34.050	3 43.906	3 53.763	43	0.118
44	2 44.932	2 54.788	3 4.645	3 14.501	3 24.358	3 34.214	3 44.071	3 53.927	44	0.120
45	2 45.096	2 54.952	3 4.809	3 14.665	3 24.522	3 34.378	3 44.235	3 54.091	45	0.123
46	2 45.260	2 55.117	3 4.973	3 14.830	3 24.686	3 34.543	3 44.399	3 54.256	46	0.126
47	2 45.425	2 55.281	3 5.137	3 14.994	3 24.850	3 34.707	3 44.563	3 54.420	47	0.129
48	2 45.589	2 55.445	3 5.302	3 15.158	3 25.015	3 34.871	3 44.728	3 54.584	48	0.131
49	2 45.753	2 55.610	3 5.466	3 15.322	3 25.179	3 35.035	3 44.892	3 54.748	49	0.134
50	2 45.917	2 55.774	3 5.630	3 15.487	3 25.343	3 35.200	3 45.056	3 54.913	50	0.137
51	2 46.082	2 55.938	3 5.795	3 15.651	3 25.508	3 35.364	3 45.220	3 55.077	51	0.140
52	2 46.246	2 56.102	3 5.959	3 15.815	3 25.672	3 35.528	3 45.385	3 55.241	52	0.142
53	2 46.410	2 56.267	3 6.123	3 15.980	3 25.836	3 35.693	3 45.549	3 55.405	53	0.145
54	2 46.574	2 56.431	3 6.287	3 16.144	3 26.000	3 35.857	3 45.713	3 55.570	54	0.148
55	2 46.739	2 56.595	3 6.452	3 16.308	3 26.165	3 36.021	3 45.878	3 55.734	55	0.151
56	2 46.903	2 56.759	3 6.616	3 16.472	3 26.329	3 36.185	3 46.042	3 55.898	56	0.153
57	2 47.067	2 56.924	3 6.780	3 16.637	3 26.493	3 36.350	3 46.206	3 56.063	57	0.156
58	2 47.232	2 57.088	3 6.944	3 16.801	3 26.657	3 36.514	3 46.370	3 56.227	58	0.159
59	2 47.396	2 57.252	3 7.109	3 16.965	3 26.822	3 36.678	3 46.535	3 56.391	59	0.162
Mean Solar.	16h	17h	18h	19h	20h	21h	22h	23h	For Seconds.	

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1915.

[For hour angles 0h to 12h the star is west of north, and for hour angles 12h to 24h it is east of north.]

Lat. / H.A.	10°	15°	20°	25°	30°	35°	40°	45°	50°	Lat. / H.A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
12	0 3.7	0 3.7	0 3.8	0 4.0	0 4.2	0 4.4	0 4.8	0 5.2	0 5.7	23 48
24	0 7.3	0 7.5	0 7.7	0 8.0	0 8.4	0 8.9	0 9.5	0 10.3	0 11.4	36
36	0 10.9	0 11.2	0 11.5	0 12.0	0 12.5	0 13.3	0 14.2	0 15.5	0 17.1	24
48	0 14.5	0 14.8	0 15.3	0 15.9	0 16.6	0 17.6	0 18.9	0 20.6	0 22.7	12
1 0	0 18.1	0 18.5	0 19.0	0 19.8	0 20.7	0 22.0	0 23.5	0 25.6	0 28.2	23 0
12	0 21.6	0 22.0	0 22.7	0 23.6	0 24.8	0 26.2	0 28.1	0 30.6	0 33.7	22 48
24	0 25.0	0 25.6	0 26.3	0 27.3	0 28.7	0 30.4	0 32.6	0 35.4	0 39.1	36
36	0 28.4	0 29.0	0 29.9	0 31.0	0 32.6	0 34.5	0 37.0	0 40.2	0 44.3	24
48	0 31.7	0 32.4	0 33.4	0 34.6	0 36.3	0 38.5	0 41.2	0 44.8	0 49.4	12
2 0	0 34.9	0 35.7	0 36.7	0 38.1	0 40.0	0 42.4	0 45.4	0 49.3	0 54.4	22 0
12	0 38.0	0 38.8	0 40.0	0 41.5	0 43.6	0 46.1	0 49.4	0 53.7	0 59.3	21 48
24	0 41.0	0 41.9	0 43.2	0 44.8	0 47.0	0 49.8	0 53.3	0 57.9	1 3.9	36
36	0 43.9	0 44.9	0 46.2	0 48.0	0 50.3	0 53.3	0 57.1	1 2.0	1 8.4	24
48	0 46.7	0 47.7	0 49.1	0 51.0	0 53.4	0 56.6	1 0.6	1 5.9	1 12.7	12
3 0	0 49.4	0 50.4	0 51.9	0 53.9	0 56.5	0 59.8	1 4.1	1 9.6	1 16.7	21 0
12	0 51.9	0 53.0	0 54.5	0 56.6	0 59.3	1 2.8	1 7.3	1 13.0	1 20.6	20 48
24	0 54.2	0 55.4	0 57.0	0 59.2	1 2.0	1 5.6	1 10.3	1 16.3	1 24.2	36
36	0 56.5	0 57.6	0 59.3	1 1.6	1 4.5	1 8.3	1 13.1	1 19.4	1 27.5	24
48	0 58.5	0 59.7	1 1.5	1 3.8	1 6.8	1 10.8	1 15.8	1 22.2	1 30.6	12
4 0	1 0.4	1 1.7	1 3.4	1 5.8	1 9.0	1 13.0	1 18.2	1 24.8	1 33.5	20 0
12	1 2.2	1 3.4	1 5.2	1 7.7	1 10.9	1 15.1	1 20.4	1 27.2	1 36.1	19 48
24	1 3.7	1 5.0	1 6.9	1 9.4	1 12.7	1 16.9	1 22.3	1 29.3	1 38.4	36
36	1 5.1	1 6.4	1 8.3	1 10.9	1 14.2	1 18.6	1 24.1	1 31.2	1 40.5	24
48	1 6.3	1 7.6	1 9.6	1 12.2	1 15.6	1 20.0	1 25.6	1 32.8	1 42.2	12
5 0	1 7.3	1 8.7	1 10.6	1 13.3	1 16.7	1 21.2	1 26.9	1 34.2	1 43.7	19 0
12	1 8.2	1 9.5	1 11.5	1 14.2	1 17.6	1 22.1	1 27.9	1 35.3	1 44.9	18 48
24	1 8.8	1 10.2	1 12.2	1 14.8	1 18.4	1 22.9	1 28.7	1 36.1	1 45.8	36
36	1 9.3	1 10.7	1 12.6	1 15.3	1 18.9	1 23.4	1 29.2	1 36.7	1 46.4	24
48	1 9.6	1 10.9	1 12.9	1 15.6	1 19.1	1 23.7	1 29.5	1 37.0	1 46.7	12
6 0	1 9.6	1 11.0	1 13.0	1 15.7	1 19.2	1 23.7	1 29.5	1 37.0	1 46.7	18 0
12	1 9.5	1 10.9	1 12.8	1 15.5	1 19.0	1 23.6	1 29.3	1 36.8	1 46.4	17 48
24	1 9.2	1 10.6	1 12.5	1 15.2	1 18.7	1 23.1	1 28.9	1 36.3	1 45.8	36
36	1 8.7	1 10.1	1 12.0	1 14.6	1 18.1	1 22.5	1 28.2	1 35.5	1 45.0	24
48	1 8.1	1 9.4	1 11.3	1 13.9	1 17.3	1 21.6	1 27.3	1 34.5	1 43.8	12
7 0	1 7.2	1 8.5	1 10.4	1 12.9	1 16.3	1 20.6	1 26.1	1 33.2	1 42.4	17 0
12	1 6.2	1 7.4	1 9.2	1 11.8	1 15.0	1 19.3	1 24.7	1 31.7	1 40.7	16 48
24	1 4.9	1 6.2	1 8.0	1 10.4	1 13.6	1 17.8	1 23.1	1 29.9	1 38.8	36
36	1 3.5	1 4.7	1 6.5	1 8.9	1 12.0	1 16.1	1 21.2	1 27.9	1 36.5	24
48	1 2.0	1 3.1	1 4.8	1 7.1	1 10.2	1 14.1	1 19.2	1 25.6	1 34.0	12
8 0	1 0.2	1 1.3	1 3.0	1 5.2	1 8.2	1 12.0	1 16.9	1 23.2	1 31.3	16 0
12	0 58.3	0 59.4	1 1.0	1 3.1	1 6.0	1 9.7	1 14.4	1 20.5	1 28.3	15 48
24	0 56.2	0 57.3	0 58.8	1 0.9	1 3.6	1 7.2	1 11.7	1 17.5	1 25.1	36
36	0 54.0	0 55.0	0 56.5	0 58.5	1 1.1	1 4.5	1 8.8	1 14.4	1 21.7	24
48	0 51.6	0 52.6	0 54.0	0 55.9	0 58.4	1 1.6	1 5.8	1 11.1	1 18.0	12
9 0	0 49.1	0 50.0	0 51.4	0 53.2	0 55.6	0 58.6	1 2.6	1 7.6	1 14.2	15 0
12	0 46.5	0 47.3	0 48.6	0 50.3	0 52.6	0 55.4	0 59.2	1 3.9	1 10.1	14 48
24	0 43.7	0 44.5	0 45.7	0 47.3	0 49.4	0 52.1	0 55.6	1 0.1	1 5.9	36
36	0 40.8	0 41.6	0 42.6	0 44.1	0 46.1	0 48.7	0 51.9	0 56.1	1 1.5	24
48	0 37.8	0 38.5	0 39.5	0 40.9	0 42.7	0 45.1	0 48.1	0 51.9	0 57.0	12
10 0	0 34.7	0 35.3	0 36.3	0 37.5	0 39.2	0 41.4	0 44.1	0 47.7	0 52.2	14 0
12	0 31.5	0 32.1	0 32.9	0 34.1	0 35.6	0 37.5	0 40.0	0 43.2	0 47.4	13 48
24	0 28.2	0 28.7	0 29.5	0 30.5	0 31.9	0 33.6	0 35.8	0 38.7	0 42.5	36
36	0 24.9	0 25.3	0 26.0	0 26.9	0 28.1	0 29.6	0 31.6	0 34.1	0 37.4	24
48	0 21.5	0 21.8	0 22.4	0 23.2	0 24.2	0 25.5	0 27.2	0 29.4	0 32.2	12
11 0	0 18.0	0 18.3	0 18.8	0 19.4	0 20.3	0 21.4	0 22.8	0 24.6	0 27.0	13 0
12	0 14.4	0 14.7	0 15.1	0 15.6	0 16.3	0 17.2	0 18.3	0 19.8	0 21.7	12 48
24	0 10.8	0 11.0	0 11.3	0 11.7	0 12.2	0 12.9	0 13.8	0 14.9	0 16.3	36
36	0 7.2	0 7.4	0 7.6	0 7.8	0 8.2	0 8.7	0 9.2	0 10.0	0 10.9	24
48	0 3.6	0 3.7	0 3.8	0 3.9	0 4.1	0 4.4	0 4.6	0 5.0	0 5.5	12
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

TABLE IV.

AZIMUTH OF POLARIS AT ALL HOUR ANGLES, 1915.

[For hour angles 0ʰ to 12ʰ the star is west of north, and for hour angles 12ʰ to 24ʰ it is east of north.]

H. A. \ Lat.	52°	54°	56°	58°	60°	61°	62°	63°	64°	Lat. / H. A.
h m	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	° ′	h m
0 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	24 0
12	0 6.0	0 6.3	0 6.6	0 7.0	0 7.4	0 7.7	0 7.9	0 8.2	0 8.5	23 48
24	0 11.9	0 12.5	0 13.2	0 14.0	0 14.8	0 15.3	0 15.8	0 16.4	0 17.0	36
36	0 17.9	0 18.8	0 19.8	0 20.9	0 22.2	0 22.9	0 23.7	0 24.6	0 25.5	24
48	0 23.7	0 24.9	0 26.2	0 27.8	0 29.5	0 30.4	0 31.5	0 32.6	0 33.8	12
1 0	0 29.5	0 31.0	0 32.6	0 34.5	0 36.7	0 37.9	0 39.2	0 40.6	0 42.1	23 0
12	0 35.3	0 37.0	0 39.0	0 41.2	0 43.8	0 45.2	0 46.8	0 48.4	0 50.2	22 48
24	0 40.9	0 42.9	0 45.2	0 47.8	0 50.8	0 52.4	0 54.2	0 56.2	0 58.3	36
36	0 46.4	0 48.6	0 51.2	0 54.2	0 57.6	0 59.5	1 1.5	1 3.7	1 6.1	24
48	0 51.7	0 54.3	0 57.2	1 0.4	1 4.2	1 6.3	1 8.6	1 11.1	1 13.7	12
2 0	0 56.9	0 59.7	1 2.9	1 6.5	1 10.7	1 13.0	1 15.5	1 18.2	1 21.1	22 0
12	1 2.0	1 5.0	1 8.5	1 12.4	1 16.9	1 19.4	1 22.1	1 25.1	1 28.2	21 48
24	1 6.8	1 10.1	1 13.8	1 18.0	1 22.9	1 25.6	1 28.5	1 31.7	1 35.1	36
36	1 11.5	1 15.0	1 19.0	1 23.5	1 28.7	1 31.6	1 34.7	1 38.0	1 41.7	24
48	1 16.0	1 19.7	1 23.9	1 28.7	1 34.2	1 37.2	1 40.5	1 44.1	1 47.9	12
3 0	1 20.2	1 24.1	1 28.5	1 33.6	1 39.4	1 42.6	1 46.1	1 49.8	1 53.9	21 0
12	1 24.2	1 28.3	1 33.0	1 38.2	1 44.3	1 47.7	1 51.3	1 55.2	1 59.5	20 48
24	1 28.0	1 32.2	1 37.1	1 42.6	1 48.9	1 52.4	1 56.2	2 0.3	2 4.7	36
36	1 31.5	1 35.9	1 41.0	1 46.7	1 53.2	1 56.9	2 0.8	2 5.0	2 9.6	24
48	1 34.7	1 39.3	1 44.5	1 50.4	1 57.2	2 1.0	2 5.0	2 9.4	2 14.1	12
4 0	1 37.7	1 42.4	1 47.8	1 53.9	2 0.8	2 4.7	2 8.9	2 13.4	2 18.3	20 0
12	1 40.4	1 45.3	1 50.8	1 57.0	2 4.1	2 8.1	2 12.4	2 17.0	2 22.0	19 48
24	1 42.8	1 47.8	1 53.4	1 59.8	2 7.1	2 11.1	2 15.5	2 20.2	2 25.3	36
36	1 45.0	1 50.0	1 55.7	2 2.2	2 9.6	2 13.8	2 18.2	2 23.0	2 28.2	24
48	1 46.8	1 51.9	1 57.7	2 4.3	2 11.8	2 16.0	2 20.5	2 25.4	2 30.6	12
5 0	1 48.3	1 53.5	1 59.4	2 6.0	2 13.6	2 17.9	2 22.4	2 27.4	2 32.7	19 0
12	1 49.5	1 54.8	2 0.7	2 7.4	2 15.1	2 19.4	2 24.0	2 28.9	2 34.3	18 48
24	1 50.5	1 55.7	2 1.7	2 8.5	2 16.2	2 20.5	2 25.1	2 30.0	2 35.4	36
36	1 51.1	1 56.4	2 2.3	2 9.1	2 16.8	2 21.2	2 25.8	2 30.8	2 36.2	24
48	1 51.4	1 56.7	2 2.6	2 9.5	2 17.2	2 21.5	2 26.1	2 31.1	2 36.5	12
6 0	1 51.4	1 56.7	2 2.6	2 9.4	2 17.1	2 21.4	2 26.0	2 31.0	2 36.4	18 0
12	1 51.1	1 56.4	2 2.2	2 9.0	2 16.7	2 20.9	2 25.5	2 30.5	2 35.8	17 48
24	1 50.5	1 55.7	2 1.6	2 8.3	2 15.9	2 20.1	2 24.6	2 29.6	2 34.8	36
36	1 49.6	1 54.8	2 0.5	2 7.2	2 14.7	2 18.9	2 23.4	2 28.2	2 33.5	24
48	1 48.4	1 53.5	1 59.2	2 5.7	2 13.2	2 17.3	2 21.7	2 26.5	2 31.7	12
7 0	1 46.9	1 51.9	1 57.6	2 4.0	2 11.3	2 15.3	2 19.7	2 24.4	2 29.5	17 0
12	1 45.1	1 50.0	1 55.6	2 1.8	2 9.0	2 13.0	2 17.3	2 21.9	2 26.9	16 48
24	1 43.0	1 47.9	1 53.3	1 59.4	2 6.5	2 10.4	2 14.5	2 19.0	2 23.9	36
36	1 40.7	1 45.4	1 50.7	1 56.7	2 3.5	2 7.3	2 11.4	2 15.8	2 20.5	24
48	1 38.1	1 42.7	1 47.8	1 53.6	2 0.3	2 4.0	2 8.0	2 12.2	2 16.8	12
8 0	1 35.2	1 39.7	1 44.6	1 50.3	1 56.7	2 0.3	2 4.2	2 8.3	2 12.7	16 0
12	1 32.1	1 36.4	1 41.2	1 46.7	1 52.9	1 56.3	2 0.0	2 4.0	2 8.3	15 48
24	1 28.8	1 32.9	1 37.5	1 42.7	1 48.7	1 52.0	1 55.6	1 59.4	2 3.5	36
36	1 25.2	1 29.1	1 33.5	1 38.6	1 44.3	1 47.4	1 50.8	1 54.5	1 58.4	24
48	1 21.4	1 25.1	1 29.3	1 34.1	1 39.6	1 42.6	1 45.8	1 49.3	1 53.1	12
9 0	1 17.4	1 20.9	1 24.9	1 29.4	1 34.6	1 37.5	1 40.6	1 43.9	1 47.4	15 0
12	1 13.1	1 16.5	1 20.3	1 24.6	1 29.5	1 32.2	1 35.1	1 38.2	1 41.6	14 48
24	1 8.7	1 11.9	1 15.4	1 19.4	1 24.1	1 26.6	1 29.3	1 32.2	1 35.4	36
36	1 4.1	1 7.1	1 10.4	1 14.1	1 18.4	1 20.8	1 23.3	1 26.0	1 29.0	24
48	0 59.4	1 2.1	1 5.1	1 8.6	1 12.6	1 14.8	1 17.1	1 19.6	1 22.4	12
10 0	0 54.5	0 57.0	0 59.8	1 2.9	1 6.6	1 8.6	1 10.8	1 13.1	1 15.6	14 0
12	0 49.4	0 51.7	0 54.2	0 57.1	1 0.4	1 2.2	1 4.2	1 6.3	1 8.5	13 48
24	0 44.2	0 46.3	0 48.5	0 51.1	0 54.1	0 55.7	0 57.5	0 59.3	1 1.3	36
36	0 39.0	0 40.7	0 42.7	0 45.0	0 47.6	0 49.0	0 50.6	0 52.2	0 54.0	24
48	0 33.6	0 35.1	0 36.8	0 38.8	0 41.0	0 42.3	0 43.6	0 45.0	0 46.5	12
11 0	0 28.1	0 29.4	0 30.8	0 32.5	0 34.3	0 35.4	0 36.5	0 37.7	0 38.9	13 0
12	0 22.6	0 23.6	0 24.8	0 26.1	0 27.6	0 28.4	0 29.3	0 30.2	0 31.2	12 48
24	0 17.0	0 17.8	0 18.6	0 19.6	0 20.7	0 21.4	0 22.0	0 22.8	0 23.5	36
36	0 11.4	0 11.9	0 12.4	0 13.1	0 13.8	0 14.3	0 14.7	0 15.2	0 15.7	24
48	0 5.7	0 5.9	0 6.2	0 6.6	0 6.9	0 7.1	0 7.4	0 7.6	0 7.9	12
12 0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	0 0.0	12 0

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1915.

Decl. / Lat.	88° 51′ 0″	88° 51′ 10″	88° 51′ 20″	88° 51′ 30″	88° 51′ 40″	88° 51′ 50″	Variation for—	
							1′ of Lat.	1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
5 0	1 9 15.8	1 9 5.8	1 8 55.7	1 8 45.7	1 8 35.7	1 8 25.6	+0.10	−1.00
5 20	1 9 18.0	1 9 8.0	1 8 57.9	1 8 47.9	1 8 37.8	1 8 27.8	0.11	1.00
5 40	1 9 20.3	1 9 10.3	1 9 0.2	1 8 50.2	1 8 40.1	1 8 30.1	0.12	1.00
6 0	1 9 22.8	1 9 12.8	1 9 2.7	1 8 52.6	1 8 42.6	1 8 32.5	0.13	1.01
6 20	1 9 25.4	1 9 15.4	1 9 5.3	1 8 55.2	1 8 45.2	1 8 35.1	0.14	1.01
6 40	1 9 28.2	1 9 18.1	1 9 8.0	1 8 58.0	1 8 47.9	1 8 37.8	+0.14	−1.01
7 0	1 9 31.1	1 9 21.0	1 9 10.9	1 9 0.9	1 8 50.8	1 8 40.7	0.15	1.01
7 20	1 9 34.1	1 9 24.1	1 9 14.0	1 9 3.9	1 8 53.8	1 8 43.7	0.16	1.01
7 40	1 9 37.3	1 9 27.3	1 9 17.2	1 9 7.1	1 8 57.0	1 8 46.9	0.16	1.01
8 0	1 9 40.7	1 9 30.6	1 9 20.5	1 9 10.4	1 9 0.3	1 8 50.2	0.17	1.01
8 20	1 9 44.2	1 9 34.1	1 9 24.0	1 9 13.9	1 9 3.8	1 8 53.6	+0.18	−1.01
8 40	1 9 47.8	1 9 37.7	1 9 27.6	1 9 17.5	1 9 7.4	1 8 57.2	0.18	1.01
9 0	1 9 51.6	1 9 41.5	1 9 31.4	1 9 21.2	1 9 11.1	1 9 1.0	0.19	1.01
9 20	1 9 55.5	1 9 45.4	1 9 35.3	1 9 25.2	1 9 15.0	1 9 4.9	0.20	1.01
9 40	1 9 59.6	1 9 49.5	1 9 39.4	1 9 29.2	1 9 19.1	1 9 8.9	0.21	1.01
10 0	1 10 3.8	1 9 53.7	1 9 43.6	1 9 33.4	1 9 23.3	1 9 13.1	+0.22	−1.02
10 20	1 10 8.2	1 9 58.1	1 9 47.9	1 9 37.8	1 9 27.6	1 9 17.4	0.22	1.02
10 40	1 10 12.8	1 10 2.6	1 9 52.4	1 9 42.3	1 9 32.1	1 9 21.9	0.23	1.02
11 0	1 10 17.5	1 10 7.3	1 9 57.1	1 9 46.9	1 9 36.8	1 9 26.6	0.24	1.02
11 20	1 10 22.3	1 10 12.1	1 10 1.9	1 9 51.7	1 9 41.6	1 9 31.4	0.24	1.02
11 40	1 10 27.3	1 10 17.1	1 10 6.9	1 9 56.7	1 9 46.5	1 9 36.3	+0.25	−1.02
12 0	1 10 32.5	1 10 22.3	1 10 12.1	1 10 1.8	1 9 51.6	1 9 41.4	0.26	1.02
12 20	1 10 37.8	1 10 27.6	1 10 17.3	1 10 7.1	1 9 56.9	1 9 46.6	0.27	1.02
12 40	1 10 43.2	1 10 33.0	1 10 22.8	1 10 12.5	1 10 2.3	1 9 52.0	0.28	1.03
13 0	1 10 49.0	1 10 38.7	1 10 28.4	1 10 18.1	1 10 7.9	1 9 57.6	0.29	1.03
13 20	1 10 54.7	1 10 44.4	1 10 34.2	1 10 23.9	1 10 13.6	1 10 3.3	+0.29	−1.03
13 40	1 11 0.6	1 10 50.4	1 10 40.1	1 10 29.8	1 10 19.5	1 10 9.2	0.30	1.03
14 0	1 11 6.7	1 10 56.5	1 10 46.2	1 10 35.8	1 10 25.5	1 10 15.2	0.31	1.03
14 20	1 11 13.0	1 11 2.7	1 10 52.4	1 10 42.1	1 10 31.7	1 10 21.4	0.32	1.03
14 40	1 11 19.4	1 11 9.1	1 10 58.8	1 10 48.4	1 10 38.1	1 10 27.8	0.32	1.03
15 0	1 11 26.0	1 11 15.7	1 11 5.4	1 10 55.0	1 10 44.6	1 10 34.3	+0.33	−1.03
15 20	1 11 32.8	1 11 22.5	1 11 12.1	1 11 1.7	1 10 51.4	1 10 41.0	0.34	1.04
15 40	1 11 39.7	1 11 29.4	1 11 19.0	1 11 8.6	1 10 58.2	1 10 47.8	0.35	1.04
16 0	1 11 46.8	1 11 36.5	1 11 26.1	1 11 15.7	1 11 5.2	1 10 54.8	0.36	1.04
16 20	1 11 54.1	1 11 43.7	1 11 33.3	1 11 22.9	1 11 12.4	1 11 2.0	0.37	1.04
16 40	1 12 1.5	1 11 51.1	1 11 40.7	1 11 30.3	1 11 19.8	1 11 9.4	+0.38	−1.04
17 0	1 12 9.2	1 11 58.7	1 11 48.3	1 11 37.8	1 11 27.4	1 11 16.9	0.38	1.05
17 20	1 12 16.9	1 12 6.5	1 11 56.0	1 11 45.5	1 11 35.1	1 11 24.6	0.39	1.05
17 40	1 12 24.9	1 12 14.4	1 12 4.0	1 11 53.5	1 11 43.0	1 11 32.5	0.40	1.05
18 0	1 12 33.1	1 12 22.6	1 12 12.1	1 12 1.5	1 11 51.0	1 11 40.5	0.41	1.05
18 20	1 12 41.4	1 12 30.9	1 12 20.3	1 12 9.8	1 11 59.3	1 11 48.7	+0.42	−1.05
18 40	1 12 50.0	1 12 39.4	1 12 28.8	1 12 18.2	1 12 7.7	1 11 57.1	0.43	1.06
19 0	1 12 58.6	1 12 48.0	1 12 37.4	1 12 26.9	1 12 16.3	1 12 5.7	0.44	1.06
19 20	1 13 7.4	1 12 56.8	1 12 46.2	1 12 35.6	1 12 25.1	1 12 14.5	0.45	1.06
19 40	1 13 16.5	1 13 5.9	1 12 55.3	1 12 44.6	1 12 34.0	1 12 23.4	0.46	1.06
20 0	1 13 25.7	1 13 15.1	1 13 4.4	1 12 53.8	1 12 43.2	1 12 32.5	+0.46	−1.06
20 20	1 13 35.2	1 13 24.5	1 13 13.8	1 13 3.2	1 12 52.5	1 12 41.8	0.47	1.07
20 40	1 13 44.7	1 13 34.1	1 13 23.4	1 13 12.7	1 13 2.0	1 12 51.3	0.48	1.07
21 0	1 13 54.6	1 13 43.9	1 13 33.2	1 13 22.5	1 13 11.7	1 13 1.0	0.49	1.07
21 20	1 14 4.6	1 13 53.9	1 13 43.1	1 13 32.4	1 13 21.6	1 13 10.9	0.50	1.07
21 40	1 14 14.7	1 14 4.0	1 13 53.3	1 13 42.5	1 13 31.7	1 13 21.0	+0.51	−1.08
22 0	1 14 25.2	1 14 14.4	1 14 3.6	1 13 52.8	1 13 42.0	1 13 31.2	0.52	1.08
22 20	1 14 35.8	1 14 25.0	1 14 14.2	1 14 3.4	1 13 52.5	1 13 41.7	0.53	1.08
22 40	1 14 46.5	1 14 35.7	1 14 24.9	1 14 14.1	1 14 3.2	1 13 52.4	0.54	1.08
23 0	1 14 57.5	1 14 46.7	1 14 35.9	1 14 25.0	1 14 14.1	1 14 3.3	0.55	1.09
23 20	1 15 8.8	1 14 57.9	1 14 47.0	1 14 36.1	1 14 25.2	1 14 14.3	+0.56	−1.09
23 40	1 15 20.2	1 15 9.3	1 14 58.4	1 14 47.5	1 14 36.5	1 14 25.6	0.57	1.09
24 0	1 15 31.8	1 15 20.9	1 15 10.0	1 14 59.0	1 14 48.1	1 14 37.1	0.58	1.09
24 20	1 15 43.7	1 15 32.7	1 15 21.8	1 15 10.8	1 14 59.8	1 14 48.8	0.60	1.10
24 40	1 15 55.8	1 15 44.8	1 15 33.8	1 15 22.8	1 15 11.8	1 15 0.8	0.61	1.10
25 0	1 16 8.0	1 15 57.0	1 15 46.0	1 15 34.9	1 15 23.9	1 15 12.9	+0.62	−1.10

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1915.

Decl. / Lat.	88° 51′ 0″	88° 51′ 10″	88° 51′ 20″	88° 51′ 30″	88° 51′ 40″	88° 51′ 50″	Variation for—	
							1′ of Lat.	1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
25 0	1 16 8.0	1 15 57.0	1 15 46.0	1 15 34.9	1 15 23.9	1 15 12.9	+0.62	−1.10
25 20	1 16 20.5	1 16 9.5	1 15 58.4	1 15 47.4	1 15 36.3	1 15 25.2	0.63	1.11
25 40	1 16 33.3	1 16 22.2	1 16 11.1	1 16 0.0	1 15 48.9	1 15 37.8	0.64	1.11
26 0	1 16 46.2	1 16 35.1	1 16 24.0	1 16 12.9	1 16 1.7	1 15 50.6	0.65	1.11
26 20	1 16 59.4	1 16 48.3	1 16 37.1	1 16 26.0	1 16 14.8	1 16 3.6	0.66	1.11
26 40	1 17 12.8	1 17 1.7	1 16 50.5	1 16 39.3	1 16 28.1	1 16 16.9	+0.68	−1.12
27 0	1 17 26.5	1 17 15.3	1 17 4.1	1 16 52.8	1 16 41.6	1 16 30.4	0.69	1.12
27 20	1 17 40.4	1 17 29.2	1 17 17.9	1 17 6.6	1 16 55.4	1 16 44.1	0.70	1.13
27 40	1 17 54.5	1 17 43.3	1 17 32.0	1 17 20.7	1 17 9.4	1 16 58.1	0.71	1.13
28 0	1 18 8.9	1 17 57.6	1 17 46.3	1 17 34.9	1 17 23.6	1 17 12.3	0.72	1.13
28 20	1 18 23.5	1 18 12.2	1 18 0.8	1 17 49.5	1 17 38.1	1 17 26.8	+0.74	−1.14
28 40	1 18 38.4	1 18 27.0	1 18 15.6	1 18 4.3	1 17 52.8	1 17 41.5	0.75	1.14
29 0	1 18 53.6	1 18 42.2	1 18 30.7	1 18 19.3	1 18 7.8	1 17 56.4	0.76	1.14
29 20	1 19 8.9	1 18 57.5	1 18 46.0	1 18 34.6	1 18 23.1	1 18 11.6	0.77	1.15
29 40	1 19 24.6	1 19 13.1	1 19 1.6	1 18 50.1	1 18 38.6	1 18 27.1	0.79	1.15
30 0	1 19 40.5	1 19 29.0	1 19 17.5	1 19 5.9	1 18 54.4	1 18 42.8	+0.80	−1.15
30 10	1 19 48.6	1 19 37.1	1 19 25.5	1 19 13.9	1 19 2.4	1 18 50.8	0.81	1.16
30 20	1 19 56.7	1 19 45.2	1 19 33.6	1 19 22.0	1 19 10.4	1 18 58.8	0.81	1.16
30 30	1 20 4.9	1 19 53.4	1 19 41.8	1 19 30.1	1 19 18.5	1 19 6.9	0.82	1.16
30 40	1 20 13.2	1 20 1.6	1 19 50.0	1 19 38.4	1 19 26.7	1 19 15.1	0.83	1.16
30 50	1 20 21.5	1 20 9.9	1 19 58.3	1 19 46.6	1 19 35.0	1 19 23.3	+0.84	−1.16
31 0	1 20 30.0	1 20 18.3	1 20 6.6	1 19 55.0	1 19 43.3	1 19 31.6	0.84	1.17
31 10	1 20 38.4	1 20 26.8	1 20 15.1	1 20 3.4	1 19 51.7	1 19 40.0	0.85	1.17
31 20	1 20 47.0	1 20 35.3	1 20 23.6	1 20 11.9	1 20 0.2	1 19 48.5	0.86	1.17
31 30	1 20 55.6	1 20 43.9	1 20 32.2	1 20 20.4	1 20 8.7	1 19 57.0	0.86	1.17
31 40	1 21 4.3	1 20 52.6	1 20 40.8	1 20 29.1	1 20 17.3	1 20 5.6	+0.87	−1.17
31 50	1 21 13.0	1 21 1.3	1 20 49.5	1 20 37.8	1 20 26.0	1 20 14.2	0.88	1.18
32 0	1 21 21.9	1 21 10.1	1 20 58.3	1 20 46.5	1 20 34.8	1 20 23.0	0.88	1.18
32 10	1 21 30.8	1 21 19.0	1 21 7.2	1 20 55.4	1 20 43.6	1 20 31.8	0.89	1.18
32 20	1 21 39.8	1 21 28.0	1 21 16.2	1 21 4.3	1 20 52.5	1 20 40.6	0.90	1.18
32 30	1 21 48.9	1 21 37.0	1 21 25.2	1 21 13.3	1 21 1.5	1 20 49.6	+0.91	−1.19
32 40	1 21 58.0	1 21 46.1	1 21 34.3	1 21 22.4	1 21 10.5	1 20 58.6	0.91	1.19
32 50	1 22 7.2	1 21 55.3	1 21 43.4	1 21 31.5	1 21 19.6	1 21 7.7	0.92	1.19
33 0	1 22 16.5	1 22 4.6	1 21 52.7	1 21 40.7	1 21 28.8	1 21 16.9	0.93	1.19
33 10	1 22 25.9	1 22 13.9	1 22 2.0	1 21 50.0	1 21 38.1	1 21 26.2	0.94	1.20
33 20	1 22 35.3	1 22 23.4	1 22 11.4	1 21 59.4	1 21 47.4	1 21 35.5	+0.95	−1.20
33 30	1 22 44.9	1 22 32.9	1 22 20.9	1 22 8.9	1 21 56.9	1 21 44.9	0.95	1.20
33 40	1 22 54.4	1 22 42.4	1 22 30.4	1 22 18.4	1 22 6.4	1 21 54.4	0.96	1.20
33 50	1 23 4.2	1 22 52.1	1 22 40.1	1 22 28.0	1 22 16.0	1 22 3.9	0.97	1.20
34 0	1 23 13.9	1 23 1.8	1 22 49.8	1 22 37.7	1 22 25.6	1 22 13.6	0.97	1.21
34 10	1 23 23.7	1 23 11.7	1 22 59.6	1 22 47.5	1 22 35.4	1 22 23.3	+0.98	−1.21
34 20	1 23 33.7	1 23 21.6	1 23 9.4	1 22 57.3	1 22 45.2	1 22 33.1	0.99	1.21
34 30	1 23 43.7	1 23 31.5	1 23 19.4	1 23 7.3	1 22 55.1	1 22 43.0	1.00	1.21
34 40	1 23 53.8	1 23 41.6	1 23 29.4	1 23 17.3	1 23 5.1	1 22 53.0	1.01	1.22
34 50	1 24 3.9	1 23 51.7	1 23 39.6	1 23 27.4	1 23 15.2	1 23 3.0	1.02	1.22
35 0	1 24 14.2	1 24 2.0	1 23 49.8	1 23 37.5	1 23 25.3	1 23 13.1	+1.02	−1.22
35 10	1 24 24.5	1 24 12.3	1 24 0.0	1 23 47.8	1 23 35.6	1 23 23.4	1.03	1.22
35 20	1 24 35.0	1 24 22.7	1 24 10.4	1 23 58.2	1 23 45.9	1 23 33.6	1.04	1.23
35 30	1 24 45.5	1 24 33.2	1 24 20.9	1 24 8.6	1 23 56.3	1 23 44.0	1.05	1.23
35 40	1 24 56.0	1 24 43.7	1 24 31.4	1 24 19.1	1 24 6.8	1 23 54.5	1.06	1.23
35 50	1 25 6.7	1 24 54.4	1 24 42.1	1 24 29.7	1 24 17.4	1 24 5.0	+1.07	−1.23
36 0	1 25 17.5	1 25 5.1	1 24 52.8	1 24 40.4	1 24 28.0	1 24 15.7	1.08	1.24
36 10	1 25 28.3	1 25 16.0	1 25 3.6	1 24 51.2	1 24 38.8	1 24 26.4	1.09	1.24
36 20	1 25 39.3	1 25 26.9	1 25 14.5	1 25 2.1	1 24 49.6	1 24 37.2	1.10	1.24
36 30	1 25 50.3	1 25 37.9	1 25 25.5	1 25 13.0	1 25 0.6	1 24 48.2	1.11	1.24
36 40	1 26 1.5	1 25 49.0	1 25 36.6	1 25 24.1	1 25 11.6	1 24 59.2	+1.12	−1.25
36 50	1 26 12.7	1 26 0.2	1 25 47.7	1 25 35.2	1 25 22.7	1 25 10.2	1.13	1.25
37 0	1 26 24.0	1 26 11.5	1 25 59.0	1 25 46.5	1 25 34.0	1 25 21.4	1.13	1.25
37 10	1 26 35.5	1 26 22.9	1 26 10.3	1 25 57.8	1 25 45.2	1 25 32.7	1.14	1.26
37 20	1 26 47.0	1 26 34.4	1 26 21.8	1 26 9.2	1 25 56.6	1 25 44.1	1.15	1.26
37 30	1 26 58.5	1 26 46.0	1 26 33.3	1 26 20.7	1 26 8.1	1 25 55.5	+1.16	−1.26

AZIMUTH OF POLARIS AT ELONGATION, 1915.

Decl. / Lat.	88° 51′ 0″	88° 51′ 10″	88° 51′ 20″	88° 51′ 30″	88° 51′ 40″	88° 51′ 50″	Variation for—	
							1′ of Lat.	1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
37 30	1 26 58.5	1 26 46.0	1 26 33.3	1 26 20.7	1 26 8.1	1 25 55.5	+1.16	−1.26
37 40	1 27 10.2	1 26 57.6	1 26 45.0	1 26 32.4	1 26 19.7	1 26 7.1	1.17	1.26
37 50	1 27 22.0	1 27 9.4	1 26 56.7	1 26 44.1	1 26 31.4	1 26 18.7	1.18	1.27
38 0	1 27 33.9	1 27 21.3	1 27 8.6	1 26 55.9	1 26 43.2	1 26 30.5	1.19	1.27
38 10	1 27 45.9	1 27 33.2	1 27 20.5	1 27 7.8	1 26 55.1	1 26 42.3	1.20	1.27
38 20	1 27 58.0	1 27 45.3	1 27 32.5	1 27 19.8	1 27 7.0	1 26 54.3	+1.21	−1.27
38 30	1 28 10.2	1 27 57.5	1 27 44.7	1 27 31.9	1 27 19.1	1 27 6.3	1.22	1.28
38 40	1 28 22.5	1 28 9.7	1 27 56.9	1 27 44.1	1 27 31.3	1 27 18.5	1.23	1.28
38 50	1 28 34.9	1 28 22.1	1 28 9.2	1 27 56.4	1 27 43.6	1 27 30.7	1.24	1.28
39 0	1 28 47.4	1 28 34.5	1 28 21.7	1 28 8.8	1 27 55.9	1 27 43.1	1.25	1.29
39 10	1 29 0.0	1 28 47.1	1 28 34.2	1 28 21.3	1 28 8.4	1 27 55.5	+1.26	−1.29
39 20	1 29 12.7	1 28 59.8	1 28 46.9	1 28 33.9	1 28 21.0	1 28 8.1	1.27	1.29
39 30	1 29 25.5	1 29 12.6	1 28 59.6	1 28 46.7	1 28 33.7	1 28 20.7	1.28	1.29
39 40	1 29 38.4	1 29 25.5	1 29 12.5	1 28 59.5	1 28 46.5	1 28 33.5	1.29	1.30
39 50	1 29 51.5	1 29 38.5	1 29 25.4	1 29 12.4	1 28 59.4	1 28 46.4	1.30	1.30
40 0	1 30 4.5	1 29 51.6	1 29 38.5	1 29 25.5	1 29 12.4	1 28 59.4	+1.31	−1.30
40 10	1 30 17.8	1 30 4.8	1 29 51.7	1 29 38.6	1 29 25.5	1 29 12.4	1.32	1.31
40 20	1 30 31.2	1 30 18.1	1 30 5.0	1 29 51.9	1 29 38.8	1 29 25.7	1.33	1.31
40 30	1 30 44.7	1 30 31.6	1 30 18.4	1 30 5.3	1 29 52.1	1 29 39.0	1.34	1.31
40 40	1 30 58.3	1 30 45.1	1 30 31.9	1 30 18.8	1 30 5.6	1 29 52.4	1.35	1.32
40 50	1 31 12.0	1 30 58.8	1 30 45.6	1 30 32.4	1 30 19.1	1 30 5.9	+1.36	−1.32
41 0	1 31 25.8	1 31 12.6	1 30 59.3	1 30 46.1	1 30 32.8	1 30 19.6	1.38	1.32
41 10	1 31 39.7	1 31 26.5	1 31 13.2	1 30 59.9	1 30 46.6	1 30 33.3	1.39	1.33
41 20	1 31 53.8	1 31 40.5	1 31 27.2	1 31 13.9	1 31 0.5	1 30 47.2	1.40	1.33
41 30	1 32 8.0	1 31 54.7	1 31 41.3	1 31 27.9	1 31 14.6	1 31 1.2	1.41	1.33
41 40	1 32 22.2	1 32 8.9	1 31 55.5	1 31 42.1	1 31 28.7	1 31 15.3	+1.42	−1.34
41 50	1 32 36.6	1 32 23.3	1 32 9.8	1 31 56.4	1 31 43.0	1 31 29.6	1.44	1.34
42 0	1 32 51.2	1 32 37.8	1 32 24.3	1 32 10.8	1 31 57.4	1 31 43.9	1.45	1.35
42 10	1 33 5.8	1 32 52.4	1 32 38.9	1 32 25.4	1 32 11.9	1 31 58.4	1.47	1.35
42 20	1 33 20.6	1 33 7.1	1 32 53.6	1 32 40.1	1 32 26.5	1 32 13.0	1.48	1.35
42 30	1 33 35.5	1 33 22.0	1 33 8.4	1 32 54.9	1 32 41.3	1 32 27.7	+1.50	−1.36
42 40	1 33 50.6	1 33 37.0	1 33 23.4	1 33 9.8	1 32 56.2	1 32 42.6	1.51	1.36
42 50	1 34 5.7	1 33 52.1	1 33 38.5	1 33 24.9	1 33 11.2	1 32 57.6	1.52	1.36
43 0	1 34 21.0	1 34 7.4	1 33 53.7	1 33 40.0	1 33 26.4	1 33 12.7	1.53	1.37
43 10	1 34 36.4	1 34 22.8	1 34 9.1	1 33 55.4	1 33 41.6	1 33 27.9	1.55	1.37
43 20	1 34 52.0	1 34 38.3	1 34 24.6	1 34 10.8	1 33 57.0	1 33 43.3	+1.56	−1.37
43 30	1 35 7.7	1 34 54.0	1 34 40.2	1 34 26.4	1 34 12.6	1 33 58.8	1.57	1.38
43 40	1 35 23.5	1 35 9.7	1 34 55.9	1 34 42.1	1 34 28.3	1 34 14.4	1.59	1.38
43 50	1 35 39.5	1 35 25.7	1 35 11.8	1 34 57.9	1 34 44.1	1 34 30.2	1.60	1.39
44 0	1 35 55.5	1 35 41.7	1 35 27.8	1 35 13.9	1 35 0.0	1 34 46.1	1.61	1.39
44 10	1 36 11.8	1 35 57.9	1 35 44.0	1 35 30.0	1 35 16.1	1 35 2.2	+1.63	−1.39
44 20	1 36 28.2	1 36 14.3	1 36 0.3	1 35 46.3	1 35 32.3	1 35 18.4	1.65	1.40
44 30	1 36 44.8	1 36 30.8	1 36 16.7	1 36 2.7	1 35 48.7	1 35 34.7	1.66	1.40
44 40	1 37 1.5	1 36 47.4	1 36 33.3	1 36 19.3	1 36 5.2	1 35 51.2	1.67	1.41
44 50	1 37 18.3	1 37 4.2	1 36 50.1	1 36 36.0	1 36 21.9	1 36 7.8	1.68	1.41
45 0	1 37 35.3	1 37 21.1	1 37 6.9	1 36 52.8	1 36 38.7	1 36 24.5	+1.69	−1.42
45 10	1 37 52.4	1 37 38.2	1 37 24.0	1 37 9.8	1 36 55.6	1 36 41.4	1.71	1.42
45 20	1 38 9.6	1 37 55.4	1 37 41.2	1 37 26.9	1 37 12.7	1 36 58.5	1.72	1.42
45 30	1 38 27.0	1 38 12.8	1 37 58.5	1 37 44.2	1 37 29.9	1 37 15.7	1.74	1.43
45 40	1 38 44.6	1 38 30.3	1 38 16.0	1 38 1.7	1 37 47.3	1 37 33.0	1.75	1.43
45 50	1 39 2.3	1 38 48.0	1 38 33.6	1 38 19.3	1 38 4.9	1 37 50.5	+1.77	−1.43
46 0	1 39 20.2	1 39 5.8	1 38 51.4	1 38 37.0	1 38 22.6	1 38 8.2	1.78	1.44
46 10	1 39 38.2	1 39 23.8	1 39 9.3	1 38 54.9	1 38 40.5	1 38 26.0	1.80	1.44
46 20	1 39 56.4	1 39 41.9	1 39 27.5	1 39 13.0	1 38 58.5	1 38 44.0	1.82	1.45
46 30	1 40 14.8	1 40 0.3	1 39 45.7	1 39 31.2	1 39 16.7	1 39 2.1	1.83	1.45
46 40	1 40 33.3	1 40 18.7	1 40 4.2	1 39 49.6	1 39 35.0	1 39 20.4	+1.85	−1.46
46 50	1 40 52.0	1 40 37.4	1 40 22.8	1 40 8.1	1 39 53.5	1 39 38.9	1.87	1.46
47 0	1 41 10.9	1 40 56.2	1 40 41.5	1 40 26.9	1 40 12.2	1 39 57.5	1.88	1.47
47 10	1 41 29.9	1 41 15.2	1 41 0.5	1 40 45.8	1 40 31.0	1 40 16.3	1.90	1.47
47 20	1 41 49.1	1 41 34.3	1 41 19.6	1 41 4.8	1 40 50.1	1 40 35.3	1.92	1.48
47 30	1 42 8.5	1 41 53.7	1 41 38.8	1 41 24.0	1 41 9.2	1 40 54.4	+1.94	−1.48

AZIMUTH OF POLARIS AT ELONGATION, 1915.

Lat. \ Decl.	88° 51′ 0″	88° 51′ 10″	88° 51′ 20″	88° 51′ 30″	88° 51′ 40″	88° 51′ 50″	Variation for— 1′ of Lat.	Variation for— 1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
47 30	1 42 8.5	1 41 53.7	1 41 38.8	1 41 24.0	1 41 9.2	1 40 54.4	+1.94	−1.48
47 40	1 42 28.0	1 42 13.2	1 41 58.3	1 41 43.5	1 41 28.6	1 41 13.8	1.96	1.48
47 50	1 42 47.7	1 42 32.8	1 42 17.9	1 42 3.0	1 41 48.1	1 41 33.2	1.98	1.49
48 0	1 43 7.6	1 42 52.7	1 42 37.7	1 42 22.8	1 42 7.8	1 41 52.9	1.99	1.49
48 10	1 43 27.7	1 43 12.7	1 42 57.7	1 42 42.7	1 42 27.7	1 42 12.8	2.01	1.50
48 20	1 43 48.0	1 43 33.0	1 43 17.9	1 43 2.9	1 42 47.8	1 42 32.8	+2.03	−1.50
48 30	1 44 8.5	1 43 53.4	1 43 38.3	1 43 23.2	1 43 8.1	1 42 53.0	2.05	1.51
48 40	1 44 29.2	1 44 14.0	1 43 58.8	1 43 43.7	1 43 28.5	1 43 13.4	2.07	1.52
48 50	1 44 50.0	1 44 34.7	1 44 19.5	1 44 4.3	1 43 49.2	1 43 34.0	2.09	1.52
49 0	1 45 11.0	1 44 55.7	1 44 40.5	1 44 25.2	1 44 10.0	1 43 54.7	2.10	1.53
49 10	1 45 32.2	1 45 16.9	1 45 1.6	1 44 46.3	1 44 31.0	1 44 15.7	+2.12	−1.53
49 20	1 45 53.6	1 45 38.3	1 45 22.9	1 45 7.6	1 44 52.2	1 44 36.9	2.14	1.53
49 30	1 46 15.2	1 45 59.8	1 45 44.4	1 45 29.0	1 45 13.6	1 44 58.2	2.16	1.54
49 40	1 46 37.0	1 46 21.6	1 46 6.1	1 45 50.7	1 45 35.2	1 45 19.8	2.18	1.54
49 50	1 46 59.0	1 46 43.6	1 46 28.1	1 46 12.6	1 45 57.0	1 45 41.5	2.20	1.55
50 0	1 47 21.3	1 47 5.8	1 46 50.2	1 46 34.6	1 46 19.1	1 46 3.5	+2.22	−1.56
50 10	1 47 43.7	1 47 28.1	1 47 12.5	1 46 56.9	1 46 41.3	1 46 25.7	2.24	1.56
50 20	1 48 6.3	1 47 50.7	1 47 35.1	1 47 19.4	1 47 3.7	1 46 48.1	2.26	1.57
50 30	1 48 29.2	1 48 13.5	1 47 57.8	1 47 42.1	1 47 26.4	1 47 10.6	2.29	1.57
50 40	1 48 52.3	1 48 36.6	1 48 20.8	1 48 5.0	1 47 49.2	1 47 33.5	2.31	1.58
50 50	1 49 15.6	1 48 59.8	1 48 44.0	1 48 28.2	1 48 12.3	1 47 56.5	+2.33	−1.58
51 0	1 49 39.1	1 49 23.3	1 49 7.4	1 48 51.5	1 48 35.6	1 48 19.7	2.35	1.59
51 10	1 50 2.9	1 49 47.0	1 49 31.1	1 49 15.1	1 48 59.1	1 48 43.2	2.38	1.59
51 20	1 50 26.9	1 50 10.9	1 49 54.9	1 49 38.9	1 49 22.9	1 49 6.9	2.41	1.60
51 30	1 50 51.1	1 50 35.1	1 50 19.0	1 50 2.9	1 49 46.9	1 49 30.8	2.43	1.61
51 40	1 51 15.6	1 50 59.5	1 50 43.4	1 50 27.2	1 50 11.1	1 49 55.0	+2.46	−1.61
51 50	1 51 40.3	1 51 24.1	1 51 7.9	1 50 51.7	1 50 35.5	1 50 19.4	2.48	1.62
52 0	1 52 5.2	1 51 49.0	1 51 32.7	1 51 16.5	1 51 0.2	1 50 44.0	2.49	1.62
52 10	1 52 30.4	1 52 14.1	1 51 57.8	1 51 41.5	1 51 25.1	1 51 8.8	2.51	1.63
52 20	1 52 55.7	1 52 39.4	1 52 23.1	1 52 6.7	1 51 50.3	1 51 34.0	2.54	1.64
52 30	1 53 21.5	1 53 5.0	1 52 48.6	1 52 32.2	1 52 15.7	1 51 59.3	+2.57	−1.64
52 40	1 53 47.4	1 53 30.9	1 53 14.4	1 52 57.9	1 52 41.4	1 52 24.9	2.59	1.65
52 50	1 54 13.5	1 53 57.0	1 53 40.4	1 53 23.9	1 53 7.3	1 52 50.8	2.62	1.66
53 0	1 54 40.0	1 54 23.4	1 54 6.8	1 53 50.1	1 53 33.5	1 53 16.9	2.64	1.66
53 10	1 55 6.7	1 54 50.0	1 54 33.3	1 54 16.6	1 54 0.0	1 53 43.3	2.67	1.67
53 20	1 55 33.6	1 55 16.9	1 55 0.2	1 54 43.4	1 54 26.7	1 54 9.9	+2.70	−1.68
53 30	1 56 0.9	1 55 44.1	1 55 27.3	1 55 10.5	1 54 53.6	1 54 36.8	2.73	1.68
53 40	1 56 28.4	1 56 11.5	1 55 54.7	1 55 37.8	1 55 20.9	1 55 4.0	2.75	1.69
53 50	1 56 56.2	1 56 39.3	1 56 22.3	1 56 5.4	1 55 48.4	1 55 31.5	2.78	1.69
54 0	1 57 24.3	1 57 7.3	1 56 50.2	1 56 33.2	1 56 16.2	1 55 59.2	2.80	1.70
54 10	1 57 52.6	1 57 35.5	1 57 18.5	1 57 1.4	1 56 44.3	1 56 27.2	+2.83	−1.71
54 20	1 58 21.2	1 58 4.1	1 57 47.0	1 57 29.8	1 57 12.7	1 56 55.5	2.87	1.72
54 30	1 58 50.2	1 58 33.0	1 58 15.8	1 57 58.6	1 57 41.3	1 57 24.1	2.90	1.72
54 40	1 59 19.5	1 59 2.2	1 58 44.9	1 58 27.6	1 58 10.3	1 57 53.0	2.93	1.73
54 50	1 59 49.0	1 59 31.6	1 59 14.3	1 58 56.9	1 58 39.5	1 58 22.2	2.96	1.74
55 0	2 0 18.9	2 0 1.4	1 59 44.0	1 59 26.5	1 59 9.1	1 58 51.6	+2.98	−1.75
55 10	2 0 49.0	2 0 31.5	2 0 14.0	1 59 56.5	1 59 39.0	1 59 21.4	3.01	1.75
55 20	2 1 19.5	2 1 1.9	2 0 44.3	2 0 26.7	2 0 9.1	1 59 51.6	3.04	1.76
55 30	2 1 50.3	2 1 32.6	2 1 15.0	2 0 57.3	2 0 39.6	2 0 22.0	3.07	1.77
55 40	2 2 21.5	2 2 3.7	2 1 45.9	2 1 28.2	2 1 10.4	2 0 52.7	3.10	1.77
55 50	2 2 52.8	2 2 35.0	2 2 17.2	2 1 59.4	2 1 41.6	2 1 23.8	+3.13	−1.78
56 0	2 3 24.6	2 3 6.7	2 2 48.8	2 2 30.9	2 2 13.1	2 1 55.2	3.17	1.79
56 10	2 3 56.7	2 3 38.8	2 3 20.8	2 3 2.8	2 2 44.9	2 2 26.9	3.21	1.80
56 20	2 4 29.2	2 4 11.2	2 3 53.1	2 3 35.1	2 3 17.0	2 2 59.0	3.24	1.80
56 30	2 5 2.0	2 4 43.9	2 4 25.8	2 4 7.6	2 3 49.5	2 3 31.4	3.28	1.81
56 40	2 5 35.2	2 5 17.0	2 4 58.8	2 4 40.6	2 4 22.3	2 4 4.1	+3.31	−1.82
56 50	2 6 8.7	2 5 50.4	2 5 32.1	2 5 13.8	2 4 55.5	2 4 37.2	3.34	1.83
57 0	2 6 42.6	2 6 24.2	2 6 5.8	2 5 47.5	2 5 29.1	2 5 10.7	3.37	1.84
57 10	2 7 16.8	2 6 58.4	2 6 39.9	2 6 21.5	2 6 3.0	2 5 44.6	3.42	1.84
57 20	2 7 51.5	2 7 32.9	2 7 14.4	2 6 55.9	2 6 37.3	2 6 18.8	3.46	1.85
57 30	2 8 26.4	2 8 7.8	2 7 49.2	2 7 30.6	2 7 12.0	2 6 53.4	+3.50	−1.86

TABLE V.

AZIMUTH OF POLARIS AT ELONGATION, 1915.

Decl. / Lat.	88° 51′ 0″	88° 51′ 10″	88° 51′ 20″	88° 51′ 30″	88° 51′ 40″	88° 51′ 50″	Variation for— 1′ of Lat.	Variation for— 1″ of δ.
° ′	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″	″	″
57 30	2 8 26.4	2 8 7.8	2 7 49.2	2 7 30.6	2 7 12.0	2 6 53.4	+3.50	−1.86
57 40	2 9 1.9	2 8 43.2	2 8 24.5	2 8 5.8	2 7 47.0	2 7 28.3	3.54	1.87
57 50	2 9 37.7	2 9 18.9	2 9 0.1	2 8 41.3	2 8 22.5	2 8 3.7	3.57	1.88
58 0	2 10 13.8	2 9 55.0	2 9 36.1	2 9 17.2	2 8 58.3	2 8 39.4	3.61	1.89
58 10	2 10 50.4	2 10 31.5	2 10 12.5	2 9 53.5	2 9 34.6	2 9 15.8	3.66	1.90
58 20	2 11 27.4	2 11 8.4	2 10 49.3	2 10 30.3	2 10 11.2	2 9 52.2	+3.70	−1.91
58 30	2 12 4.8	2 11 45.7	2 11 26.6	2 11 7.4	2 10 48.3	2 10 29.1	3.74	1.92
58 40	2 12 42.7	2 12 23.5	2 12 4.3	2 11 45.0	2 11 25.8	2 11 6.5	3.78	1.92
58 50	2 13 21.0	2 13 1.7	2 12 42.3	2 12 23.0	2 12 3.7	2 11 44.4	3.82	1.93
59 0	2 13 59.7	2 13 40.3	2 13 20.9	2 13 1.5	2 12 42.0	2 12 22.6	3.87	1.94
59 10	2 14 38.9	2 14 19.4	2 13 59.9	2 13 40.3	2 13 20.8	2 13 1.3	+3.92	−1.95
59 20	2 15 18.5	2 14 58.9	2 14 39.3	2 14 19.7	2 14 0.0	2 13 40.4	3.96	1.96
59 30	2 15 58.6	2 15 38.9	2 15 19.2	2 14 59.5	2 14 39.7	2 14 20.0	4.00	1.97
59 40	2 16 39.1	2 16 19.3	2 15 59.5	2 15 39.7	2 15 19.9	2 15 0.1	4.05	1.98
59 50	2 17 20.2	2 17 0.2	2 16 40.3	2 16 20.4	2 16 0.5	2 15 40.6	4.10	1.99
60 0	2 18 1.7	2 17 41.7	2 17 21.6	2 17 1.6	2 16 41.6	2 16 21.6	+4.15	−2.00

TABLE Va.

FOR REDUCING TO ELONGATION, OBSERVATIONS MADE NEAR ELONGATION.

Azimuth at Elong. / *Time.	1° 10′	1° 20′	1° 30′	1° 40′	1° 50′	2° 0′	2° 10′	2° 20′	Azimuth at Elong. / Time.*
m	″	″	″	″	″	″	″	″	m
0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0
1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.1	+ 0.2	1
2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	2
3	0.4	0.4	0.4	0.5	0.6	0.6	0.7	0.7	3
4	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	4
5	+ 1.0	+ 1.1	+ 1.3	+ 1.4	+ 1.6	+ 1.7	+ 1.9	+ 2.0	5
6	1.4	1.6	1.8	2.1	2.3	2.5	2.7	2.9	6
7	2.0	2.2	2.5	2.8	3.1	3.4	3.7	3.9	7
8	2.6	2.9	3.3	3.7	4.0	4.4	4.8	5.1	8
9	3.3	3.7	4.2	4.7	5.1	5.5	6.0	6.5	9
10	+ 4.0	+ 4.6	+ 5.1	+ 5.7	+ 6.3	+ 6.8	+ 7.4	+ 8.0	10
11	4.9	5.6	6.2	6.9	7.6	8.3	9.0	9.7	11
12	5.8	6.6	7.4	8.2	9.0	9.9	10.7	11.5	12
13	6.8	7.8	8.7	9.7	10.6	11.6	12.5	13.5	13
14	7.8	9.0	10.1	11.2	12.3	13.4	14.5	15.7	14
15	+ 9.0	+10.3	+11.6	+12.9	+14.1	+15.4	+16.7	+18.0	15
16	10.2	11.7	13.2	14.6	16.1	17.5	19.0	20.4	16
17	11.5	13.2	14.9	16.4	18.2	19.8	21.4	23.0	17
18	12.9	14.8	16.7	18.5	20.4	22.2	24.0	25.9	18
19	14.4	16.5	18.6	20.7	22.7	24.7	26.8	28.9	19
20	+16.0	+18.3	+20.6	+22.9	+25.1	+27.4	+29.7	+32.0	20
21	17.7	20.2	22.7	25.2	27.7	30.2	32.7	35.3	21
22	19.4	22.1	24.9	27.6	30.4	33.2	35.9	38.7	22
23	21.2	24.2	27.2	30.2	33.2	36.3	39.2	42.3	23
24	23.0	26.3	29.6	32.9	36.2	39.4	42.7	46.0	24
25	+25.0	+28.6	+32.1	+35.7	+39.3	+42.7	+46.3	+49.9	25
26	27.0	30.9	34.7	38.6	42.4	46.3	50.1	54.0	26
27	29.1	33.3	37.5	41.6	45.7	50.0	54.0	58.2	27
28	31.3	35.8	40.3	44.7	49.2	53.7	58.1	62.6	28
29	33.6	38.4	43.2	48.0	52.8	57.6	62.3	67.1	29
30	+35.9	+41.1	+46.2	+51.4	+56.5	+61.6	+66.7	+71.8	30

*Sidereal time from elongation.

FOR FINDING THE TIMES OF UPPER AND LOWER CULMINATION OF POLARIS FROM THE OBSERVED TIMES WHEN THE STAR IS ON THE SAME VERTICAL CIRCLE WITH THE STARS ζ URSÆ MAJORIS (MIZAR) *SUB POLO* AND δ CASSIOPEIÆ *SUB POLO*, RESPECTIVELY.

Except at high latitudes, the pole star at either upper or lower culmination furnishes a simple and convenient method for laying down a meridian line on the earth's surface at points in the northern hemisphere. When the local time is unknown and accurate astronomical instruments are not available, the time of culmination of Polaris may be found by observing the instant when Polaris is vertically above (has the same azimuth as) ζ Ursæ Majoris (Mizar) below the pole, or δ Cassiopeiæ below the pole. In the former case, for the year 1915, Polaris is approaching upper culmination and in the latter case it is approaching lower culmination. The mean time interval which elapses between the observed times above mentioned and upper or lower culmination, as the case may be, are given for ζ Ursæ Majoris and δ Cassiopeiæ for ten-day intervals in the following table. This method can not be used at places south of 30° north latitude.

TABLE VI.

MEAN TIME INTERVAL.

ζ URSÆ MAJORIS (MIZAR). (Upper culmination of Polaris.)							δ CASSIOPEIÆ. (Lower culmination of Polaris.)						
1915	Lat.	40°	45°	50°	55°	60°	1915	Lat.	35°	40°	45°	50°	55°
		m s	m s	m s	m s	m s			m s	m s	m s	m s	m s
Jan.	1	8 18	8 16	8 14	8 12	8 9	Jan.	1	9 23	9 24	9 26	9 29	9 31
	11	8 8	8 6	8 4	8 2	7 59		11	9 13	9 14	9 16	9 18	9 20
	21	7 56	7 55	7 53	7 51	7 48		21	9 1	9 3	9 5	9 7	9 9
July	10	8 13	8 12	8 10	8 7	8 4		31	8 51	8 52	8 54	8 56	8 58
	20	8 24	8 23	8 21	8 18	8 15	Feb.	10	8 41	8 43	8 44	8 46	8 49
	30	8 35	8 33	8 31	8 28	8 25		20	8 32	8 33	8 35	8 37	8 39
Aug.	9	8 45	8 44	8 42	8 39	8 36	Mar.	2	8 23	8 25	8 26	8 28	8 31
	19	8 55	8 53	8 51	8 49	8 46		12	8 18	8 19	8 20	8 22	8 25
	29	9 4	9 2	9 0	8 57	8 54		22	8 13	8 15	8 16	8 18	8 20
Sept.	8	9 11	9 9	9 7	9 4	9 1	Apr.	1	8 10	8 12	8 13	8 15	8 17
	18	9 19	9 17	9 15	9 12	9 8		11	8 10	8 11	8 13	8 15	8 17
	28	9 23	9 21	9 19	9 16	9 13		21	8 13	8 14	8 16	8 18	8 20
Oct.	8	9 26	9 24	9 22	9 19	9 16	May	1	8 16	8 17	8 19	8 21	8 23
	18	9 28	9 26	9 24	9 21	9 18		11	8 21	8 22	8 24	8 26	8 28
	28	9 29	9 27	9 25	9 22	9 19		21	8 28	8 29	8 31	8 33	8 35
Nov.	7	9 28	9 26	9 24	9 21	9 17		31	8 37	8 38	8 40	8 42	8 44
	17	9 24	9 22	9 20	9 17	9 14	June	10	8 46	8 47	8 49	8 51	8 54
	27	9 19	9 17	9 15	9 12	9 9		20	8 56	8 57	8 59	9 1	9 4
Dec.	7	9 13	9 11	9 9	9 6	9 3		30	9 7	9 9	9 11	9 13	9 15
	17	9 5	9 3	9 1	8 58	8 55	July	10	9 19	9 20	9 22	9 24	9 27
	27	8 56	8 54	8 52	8 49	8 46		20	9 30	9 31	9 33	9 35	9 38
	31	8 53	8 51	8 49	8 46	8 43		30	9 40	9 42	9 44	9 47	9 49

ON THE ARRANGEMENT AND USE OF THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC.

The matter contained in the first 175 pages of this volume is intended primarily for the use of navigators, and consists of ephemerides of the Sun and Moon and of the planets Mercury, Venus, Mars, Jupiter, and Saturn. The remainder of the book contains ephemerides of all the planets, of their satellites, of 825 fixed stars, elements for the computation of predictions of eclipses of the Sun and Moon and of occultations of stars, tables of the pole star, Polaris, and in addition miscellaneous data for the convenience and use of astronomers, surveyors, and the general public.

TIME.

There are in general use three different kinds of time, True Solar Time—also called Apparent Solar Time—Mean Solar Time, and Sidereal Time.

True or Apparent Solar Time is measured by the diurnal motion of the Sun, the length of the day being the interval between two successive transits of the Sun over the same meridian, and the time of day being the hour-angle of the Sun westward from the meridian. Owing to the obliquity of the ecliptic and to the lack of uniformity of the motion of the Earth in its orbit, the rate of motion of the Sun in hour-angle and the length of the apparent solar day are not constant. Therefore clocks and chronometers can not be regulated to apparent solar time, which may, however, be determined by observations of the Sun when visible.

Mean Solar Time is measured by the motion of a fictitious body called the mean Sun which is supposed to move uniformly in the celestial equator, completing the circuit in one tropical year. Since mean solar time is uniform and regular in its passage, clocks and watches may be regulated to it, and those in ordinary use are usually so regulated.

Mean solar time can not, of course, be determined by direct observation, but may be determined indirectly by correcting observations of the Sun for the equation of time (page 702), or by converting to mean time sidereal time determined by observations of fixed stars (page 701).

The Mean Solar Day is the unit of mean solar time, and is equal in length to the mean or average of all the true or apparent solar days of the year. It may be otherwise defined as the interval of time elapsing between two successive transits of the mean Sun across the meridian of any place.

Sidereal Time or star time, in general terms, is measured by the diurnal motion of the fixed stars, or, speaking more precisely, by the diurnal motion of that point on the celestial equator called the vernal equinox, from which the right ascensions of the heavenly bodies are measured. Astronomical clocks regulated to sidereal time are called sidereal clocks. Sidereal time may be determined from observations of stars whose right ascensions are known.

A Sidereal Day is very nearly the length of time in which the Earth rotates on its axis and is accurately defined as the time interval between two successive transits of the vernal equinox over the same meridian. The sidereal day is shorter than the mean solar day by $3^m\ 56^s.555$ sidereal time or $3^m\ 55^s.909$ mean solar time, the tropical year of 365.2422 mean solar days containing 366.2422 sidereal days. Sidereal time and the length of the sidereal day are subject to slight irregularities on account of small differences between the positions of the true and mean equinoxes.

The mean solar and sidereal days are each divided into 24 hours. About March 23 (civil date) of each year, about two days after the vernal equinox, there is an instant when the face of a sidereal clock shows the same time as a mean time clock, and the former gains on the latter $3^m\ 56^s.555$ sidereal time per mean solar day, so that at the end of a year it will have gained one sidereal day and will again agree with the mean time clock.

The Equation of Time is the difference in hour-angle between the true Sun and the mean Sun. The true Sun is sometimes before and sometimes behind the mean Sun by an amount which varies from zero to about 16 minutes. The equation of time is given on pages I and II of each month of the Greenwich Ephemeris, and in the Solar Ephemeris for the Meridian of Washington, pages 518–525.

The Civil Day begins at midnight and comprises 24 hours, the hours being counted from 0 to 12 in two series; the first, marked A. M., running from midnight to noon, and the second, marked P. M., running from noon to midnight.

The Astronomical Day begins at noon on the civil day of the same date, the 24 hours being counted from 0 to 24, running from noon of one day to noon of the next following day. Astronomical time as well as civil time may be either apparent or mean.

The civil day begins twelve hours before the astronomical day; therefore the first half of the civil day corresponds to the last half of the preceding astronomical day, and the last half of the civil day coincides with the first half of the astronomical day of the same date. Thus, January 9, 2 o'clock, A. M., civil time, is January 8, 14^h, astronomical time; and January 9, 2 o'clock, P. M., civil time, is January 9, 2^h, astronomical time.

PRECEPTS FOR THE CONVERSION OF TIME.

To convert Sidereal Time at any place into Mean Solar Time, subtract the sidereal time of local mean noon for the beginning of the astronomical day, from the given sidereal time, and convert the interval of sidereal time thus found into mean time by means of Table II, page 686.

To convert Mean Solar Time at any place into Sidereal Time, convert the given interval of mean time (counted from mean noon) into sidereal time by means of Table III, page 689, and add the sidereal time of local mean noon for the beginning of the astronomical day.

Processes similar to the above may be employed, using the mean time of sidereal noon given on page III of the Greenwich Ephemeris instead of the sidereal time of mean noon.

To convert Apparent Solar Time into Mean Solar Time, add or subtract the equation of time as indicated on page I of the Greenwich Ephemeris, or add algebraically the equation of time taken from the Washington Solar Ephemeris, pages 518–525.

To convert Mean Solar Time into Apparent Solar Time, add or subtract the equation of time as indicated on page II of the Greenwich Ephemeris, or subtract algebraically the equation of time taken from the Washington Solar Ephemeris, pages 518–525.

To convert Civil Time into Astronomical Time.—If the civil time is marked A. M., take one from the day and add twelve to the hours; if the civil time is marked P. M., take away the designation P. M.

To convert Astronomical Time into Civil Time.—If the astronomical time is less than twelve hours, write P. M. after it; if greater than twelve hours, subtract twelve hours from it, mark the result A. M., and add one to the days. For example, October 3, 23 hours, astronomical time, is October 4, 11 o'clock, A. M., civil time.

To convert Mean Solar or Sidereal Time of any meridian B to that of another meridian A, add the difference of longitude expressed in time when A is east of B, and subtract the difference of longitude when A is west of B.

PART I.—THE EPHEMERIS FOR THE MERIDIAN OF GREENWICH.

Pages 2–145 give data arranged under the heads of the several months, and are therefore designated as the Calendar. Each month covers 12 pages, numbered from I to XII, whose contents are as follows:

Page I contains, for Greenwich apparent noon of each day, *The Sun's Apparent Right Ascension* and *Declination*, and the *Equation of Time*. Adjoining columns contain the differences of these quantities for one hour. By multiplying any one of these differences by the hours and parts of an hour from Greenwich apparent noon, and adding the product to, or subtracting it from, the corresponding quantity at noon, according as that quantity is increasing or decreasing, we obtain the value of the quantity in question for any given Greenwich apparent time. The hourly differences are given for the instant of apparent noon at Greenwich, but when great accuracy is required they should be interpolated for half the hours and parts of an hour of the Greenwich apparent time.

The *Equation of Time* given on page I is the mean time of apparent noon, or the hour-angle of the mean Sun at that instant. The heading of the column directs how the equation is to be applied to apparent time, or the time given by an observation of the Sun, in order to get mean time. When in the course of the month there is a change from addition to subtraction or the reverse (as in the months of April and June), the two different directions are separated by a line, while a corresponding line below points out the dates between which the change occurs.

The Sun's Semidiameter and the *Sidereal Time of Semidiameter Passing Meridian* are also given on page I. The semidiameter is used in reducing the altitude of the upper or lower limb of the Sun to the altitude of the center; and in reducing the angular distance between the limb of the Sun and any other object, to the distance from the center of the Sun. The sidereal time of semidiameter passing the meridian is employed in obtaining the passage of the Sun's center over the wires of a transit instrument, when the passage of one limb only has been observed. The quantity found in this column is to be added to the time of transit of the first, or western, limb; and to be subtracted from the time of transit of the second, or eastern, limb.

This page is chiefly used when the Sun is observed on the meridian, at which instant the local apparent time is $0^h\ 0^m\ 0^s$. The longitude from Greenwich expressed in time is then the corresponding Greenwich apparent time before or after noon according as the longitude is east or west. The longitude of any place is therefore the factor employed in reducing the quantities on this page to apparent noon at that place.

The right ascension of the Sun thus reduced is the sidereal time of local apparent noon, and the difference between that and the clock time of the meridian passage of the Sun is the error of the clock on sidereal time.

The declination of the Sun reduced to the meridian, or apparent noon, of the place, is required in finding the latitude from a meridian altitude of the Sun.

As an example of the use of page I:—

Let the Sun's declination be required at apparent noon, 1915, April 15, at a place whose longitude is 89° 40′, or $5^h\ 58^m\ 40^s$ west from Greenwich:—

		h	m	s
Local apparent time	April 15,	0	0	0
Longitude from Greenwich (additive)		5	58	40
Greenwich apparent time	April 15,	5	58	40

Reducing the minutes and seconds to decimals of an hour, we find that this moment is $5^h.978$ after Greenwich apparent noon on April 15, or $18^h.022$ before Greenwich apparent noon on April 16.

On page 38 of the Ephemeris we find that the change of declination in one hour is:

	″
April 15, at Greenwich apparent noon	+53.94
April 16, at Greenwich apparent noon	+53.54
Difference for one day	− 0.40

If great exactness is desired, we find the amount of this hourly difference for the time which is halfway between Greenwich noon and the time of observation; that is, for 3 hours after Greenwich noon of the 15th, this being half of 6 hours. Three hours is 0.125 of a day; so the calculation is as follows:

	″
Difference for one hour, April 15	+53.94
Change for 0.125 of a day or $-0''.40\times0.125$ . .	− 0.05
Difference at 3 hours after noon	+53.89

$53.89\times5.978=322''.2=5'\ 22''.2$

		°	′	″
Declination at Greenwich noon, April 15 . .	N.	9	28	42.7
Change in 5.978 hours (additive)			5	22.2
Sun's declination at time of observation . .	N.	9	34	4.9

When the time of observation is only a few hours before Greenwich noon, it may be better to count the longitude backward from this nearest noon. Thus, in the example just given the time is $18^h.022$ before Greenwich noon of April 16; half this interval is about 0.375 of a day, and the hourly motion for the middle of the nterval is $53''.69$. Then, we find—

		°	′	″
Declination at Greenwich noon, April 16 . .	N.	9	50	12.4
Product of $53''.69 \times 18.022 = 967''.6$ (subtractive)		−	16	7.6
Sun's declination at time of observation . .	N.	9	34	4.8

It will always be well to make the calculation in both ways, as a check; but if the results differ slightly, the one derived from the nearest noon should be regarded as the more accurate.

Page II contains, for Greenwich mean noon of each day, *The Sun's Apparent Right Ascension* and *Declination*, the *Equation of Time*, and the *Sidereal Time of Mean Noon.* The hourly changes of these quantities are also given, and may be used in reducing them for the longitude, or to any Greenwich mean time. When great precision is required, these changes should be interpolated for half the Greenwich time, as described in explaining the calculation of the declination.

The *Equation of Time* given on page II is the apparent time of mean noon, and is equivalent to the hour-angle of the true Sun at the instant of mean noon. The heading of the column directs how the equation must be applied to mean time in order to obtain apparent time.

The *Sidereal Time of Mean Noon* is the right ascension of the mean Sun at Greenwich mean noon. It may be reduced for the longitude, or to any Greenwich mean time, by using the hourly difference, $9^s.8565$; or by Table III, page 689 of this volume, for reducing intervals of mean solar to sidereal time.

The right ascensions and declinations on pages I and II are affected both by aberration and nutation, and therefore denote the *apparent* positions of the *true* Sun. Page I is used for observations which depend upon apparent time, as when the Sun is observed on the meridian; while page II is used when the times have been noted by a clock or chronometer regulated to mean time, as is the case in most observations of the Sun out of the meridian.

The Sun's declination is required whenever that body is observed for the purpose of finding latitude, local time, or azimuth, and the equation of time is needed in finding the apparent time when determining the latitude from observations of the Sun out of the meridian.

The sidereal time of mean noon, or right ascension of the mean Sun, is useful in converting mean time to sidereal time. We first find the Greenwich mean time, then the right ascension of the mean Sun for that time, and this being added to the local astronomical mean time will give the sidereal time.

The sidereal time of mean noon, reduced for the longitude of the place, is also used in converting sidereal time to mean time. Subtracting the reduced value from the given sidereal time gives the interval of sidereal time from noon, and that is converted into the required mean time by subtracting from it the corresponding reduction of a sidereal interval to a mean-time interval, taken from Table II, page 686 of this volume. Instead of using Table II, this reduction may be found by multiplying $9^s.8296$ by the hours and parts of an hour of the sidereal interval from noon.

As examples of the use of page II:—

1.—Let the Sun's right ascension and the equation of time be required for 1915, July 13, $10^h\ 3^m\ 30^s$, A. M., mean time, at a place whose longitude is 85° 15′, or $5^h\ 41^m\ 0^s$ west of Greenwich.

		h m s
Local astronomical mean time	July 12,	22 3 30
Longitude from Greenwich (additive)		5 41 0
Greenwich mean time	July 13,	3 44 30$=3^h.7417$

Sun's Right Ascension.		*Equation of Time.*	
	h m s		m s
July 13, Greenwich noon	7 26 34.28	July 13, Greenwich noon	5 25.71 (subtractive)
H. D. $10^s.173 \times 3.7417$	+ 38.06	H. D. $+0^s.316 \times 3.7417$	+ 1.18
	7 27 12.34		5 26.89

In this case the hourly differences interpolated to half the interval, or $1^h.87$ after noon, have been used. The equation of time is here subtractive from mean time.

2.—If the sidereal time is required for the same time and place, we have—

	h m s
July 13, sidereal time (at Greenwich mean noon)	7 21 8.57
Reduction for $3^h\ 44^m\ 30^s$ from Table III, or $9^s.8565 \times 3.7417$.	+ 36.88
Add the local astronomical mean time	22 3 30.00
The required sidereal time is (rejecting 24^h)	5 25 15.45

3.—On 1915, July 13, A. M., at a place whose longitude is 85° 15′ W., suppose the sidereal time to be $5^h\ 26^m\ 12^s.44$ and that the corresponding mean time is required.

The astronomical day is July 12; the longitude in time, $+5^h\ 41^m\ 0^s$, or $+5^h.6833$

	h m s
July 12, sidereal time (at Greenwich mean noon)	7 17 12.01
Reduction for $5^h\ 41^m\ 0^s$ from Table III, or $9^s.8565 \times 5.6833$.	+ 56.02
The sidereal time of local mean noon	7 18 8.03
The given sidereal time ($+24^h$, if necessary for the following subtraction)	29 26 12.44
Subtracting the first from the second gives the sidereal interval from noon	22 8 4.41$=22^h.1346$
Reduction for $22^h\ 8^m\ 4^s.41$ from Table II, or $-9^s.8296 \times 22.1346$	− 3 37.57
The required astronomical mean time is . July 12,	22 4 26.84

Page III contains, for Greenwich mean noon of each day, *The Sun's True Longitude* and *Latitude*, and the *Logarithm of the Radius Vector of the Earth*. The longitudes of the Sun are the true geometric longitudes, not corrected for aberration. They are given in two columns, headed, respectively, λ and λ′; λ representing the Sun's longitude counted from the true equinox of the date; and λ′, the same coordinate counted from the mean equinox of the beginning of the Besselian fictitious year. The latitude is referred to the mean ecliptic of the date. Columns of hourly differences are given to facilitate finding the Sun's longitude, or the logarithm of the radius vector, for any hour from noon.

The last column on page III contains the *Mean Time of Sidereal Noon;* that is, the number of hours, minutes, and seconds after Greenwich mean noon when the vernal equinox passes the meridian of Greenwich. It may be reduced to any eridian, or to any Greenwich sidereal time, by using the hourly difference, $-9^s.8296$, to effect the necessary interpolation. The reduction, however, can be aken directly from Table II for reducing intervals of sidereal time to mean solar ime.

This column may be used in converting sidereal time to mean time instead of hat on page II. As an illustration, let us take Example 3, above.

It is seen in advance that the sum of the mean time of sidereal noon and the iven sidereal time is less than 24 hours. Were it more than 24 hours, the mean ime of sidereal noon should be taken out for July 11; that is, the preceding astroomical day.

	h	m	s
July 12, the mean time of Greenwich sidereal noon is	16	40	3.70
Reduction for longitude from Table II, or $-9^s.8296\times 5.683$ . .			-55.86
The mean time of local sidereal noon	16	39	7.84
Add the given sidereal time	5	26	$12.44 = 5^h.4368$
The sum is	22	5	20.28
Reduction for $5^h\ 26^m\ 12^s.44$ from Table II, or $-9^s.8296 = 5.4368$.			-53.44
The required astronomical mean time . . July 12,	22	4	26.84

Page IV contains *The Moon's Semidiameter* and *Equatorial Horizontal Parallax* for each mean noon and midnight at Greenwich. Columns adjoining those of the horizontal parallax give the change of that quantity in one hour, by means of which it can be reduced to any other Greenwich mean time, in the same way as the Sun's declination and the equation of time in the preceding examples. The sign plus or minus is prefixed to the hourly differences, according as the horizontal parallax is increasing or decreasing.

The reduction of the Moon's semidiameter may be readily found by multiplying the reduction of the horizontal parallax by 0.2725 (see p. xi), or by simply computing the proportional part.

If, for example, the semidiameter of the Moon is to be taken out for 1915, March 10, 7^h, P. M., Greenwich mean time, we see that the difference of the semidiameters at noon and midnight of March 10 is $3''.7$; then,

$$12^h : 7^h = 3''.7 : 2''.2$$

which is the correction to be subtracted from the semidiameter at noon, because the semidiameter is decreasing. The Moon's semidiameter for March 10, 7^h, is therefore $15'\ 51''.1$.

The Moon's semidiameter and horizonal parallax are required for all observations of the Moon. When great precision is needed, the hourly differences should be interpolated for half the interval of Greenwich time from noon or midnight, and the horizontal parallax should be corrected for the latitude of the place of observation.

The mean time of *The Moon's Upper Transit* at Greenwich and the *Age of the Moon* are also contained on page IV. The time of transit is given to tenths of a minute, and is accompanied by a column of differences for one hour of longitude, by means of which the local time of the Moon's meridian transit may be computed for any other place whose longitude is known. The age of the Moon, or the time elapsed since the preceding new Moon, is given to tenths of a day.

Pages V–XII contain *The Moon's Right Ascension* and *Declination* for each day and hour of Greenwich mean time. They are accompanied by columns of differences for one minute, which are also given at each hour. The Greenwich mean time, which is required for taking out these quantities, may either be taken from a well-regulated chronometer, or may be obtained by applying the longitude, converted into time, to the local mean time of the observer. The right ascension or declination is taken out for the given day and hour of Greenwich mean time; the *Diff. for 1 Minute* is multiplied by the minutes and parts of a minute of the Greenwich time, and the product is added to or subtracted from the quantity, according as the latter is increasing or decreasing.

Thus, suppose the Moon's right ascension and declination are required for 1915, January 25, 10^h 10^m 30^s, astronomical mean time at Greenwich:—

	Right Ascension.			*Declination.*				
	h	m	s			°	′	″
January 25, 10^h . . .	4	4	3.80	. . . . .	N.	26	4	33.1
Diff. $2^s.1777 \times 10.5$ . . .			22.87	$+5''.425 \times 10.5$				+ 57.0
January 25, 10^h 10^m 30^s . .	4	4	26.67	. . . . . .	N.	26	5	30.1

For the sake of precision, the differences here employed have been interpolated for $5^m.2 = 0^h.09$.

Page XII contains also the *Phases of the Moon* and the dates of the *Moon's Perigee and Apogee*, or least and greatest distances from the Earth.

Pages 146–177 contain the geocentric ephemerides of the seven major planets. The places given are apparent positions; that is, they are referred to the equator and true equinox of the date, and are corrected for aberration. All the data except meridian passage are given for the instant of Greenwich mean noon. The column *Meridian Passage* shows the hour, minute, and tenth of that passage of the planet over the meridian of Greenwich which occurs next after the noon of the date.

The right ascension and declination of a planet are required whenever it is observed for time, latitude, or azimuth. The mode of reducing the ephemeris positions of planets to other instants of Greenwich mean time is the same as that given for the Sun on pages 704–707. The local mean time of meridian passage of any planet, at any place, can be found by dividing the proper daily difference of the ephemeris times by 24, multiplying the quotient by the longitude of the place expressed in hours and fractions, and applying the product with its proper sign to the time of Greenwich passage.

Pages 178–199 contain the heliocentric coordinates of the seven major planets, and the logarithms of their distances from the Earth. The *Heliocentric Longitude* is reckoned, not from the true equinox, as in the preceding ephemerides, but from the mean equinox of the date. It is, therefore, necessary to apply nutation, if the longitude from the true equinox is required. The *Daily Motion* is given for the instant of Greenwich mean noon. The column *Reduction to Orbit* contains the correction to be applied to the heliocentric longitude in order to obtain the longitude counted along the orbit of the planet. The latter is equal to the distance from the mean equinox to the node, plus the distance from the node to the planet. The *Heliocentric Latitude* is counted from the mean ecliptic of the date. The

Logarithm of Radius Vector is the logarithm of the distance of the center of the planet from that of the Sun, at the Greenwich mean noon whose date is given in the first column. The last two columns give, respectively, the logarithm of the true distance of the center of the planet from that of the Earth, for the Greenwich noon indicated on the left-hand side of the page, and for the time which is midway between that date and the date next below it. In the case of Mercury, this intermediate date is mean midnight of the same day; in the case of Venus and Mars, it is the mean noon of the day immediately following; in the case of Jupiter and Saturn, it is mean noon of the second day following; and in the case of Uranus and Neptune, mean noon of the fourth day following.

Pages 200–207 contain the rectangular coordinates of the center of the Sun, referred to the center of the Earth as the origin, and to the true equator and equinox of each date as the plane and point of reference. Each coordinate is given both for Greenwich mean noon and for Greenwich mean midnight of the same day. The columns *Reduc. to Mean Eq'x of Jan. o,* give the corrections to be applied to the coordinates for noon in order to obtain the corresponding coordinates referred to the mean equator and the mean equinox of the beginning of the Besselian fictitious year.

Pages 208–211 contain for every Greenwich mean noon and midnight the apparent geocentric longitude and latitude of the Moon referred to the true ecliptic and equinox of the date.

Page 212 contains the position of the *Moon's Equator*, the *Longitude of the Moon's Perigee*, the *Mean Longitude of the Moon's Ascending Node*, and the *Moon's Mean Longitude.*

Page 213 contains the elements of the *Moon's Libration*, and the *Sun's Aberration and Horizontal Parallax.* The formulæ for finding the libration in longitude and latitude are given on page xi. *The Sun's Aberration* is the quantity which is to be applied to the true longitude of the Sun in order to obtain its apparent longitude. The correction being negative shows that the apparent longitude as affected by aberration is always less than the true longitude. The *Sun's Horizontal Parallax*, given in the last column, is the angle subtended by the equatorial radius of the Earth, as seen from the center of the Sun.

Pages 214, 231–232 contain data for precession and the obliquity of the ecliptic, together with all sensible terms arising from the motions of the equator and ecliptic. To show clearly the relations of these quantities, let

λ = the longitude of any body referred to the true equinox of the date.

λ' = the longitude of the same body referred to the mean equinox of the beginning of the Besselian fictitious year.

ψ_1 = the adopted value of the general precession.

$\delta'\psi$ = the principal term of the nutation in longitude; or, in other words, the correction to be applied to the longitude of a body referred to the mean equinox of date, in order to obtain that longitude as referred to the true equinox, exclusive of short period terms. When the correction is positive, the longitudes referred to the true equinox are greater than those referred to the mean equinox; while the contrary is the case when the correction has a negative sign.

$\delta''\psi$ = the short period terms of nutation in longitude, given on pages 231–232.

ω = the true or apparent obliquity of the ecliptic at the date.

ω' = the mean obliquity of the ecliptic at the beginning of the Besselian fictitious year.

$\delta'\omega$ = the principal term of the nutation of the obliquity of the ecliptic; or, in other words, the correction to be applied to the mean obliquity of date in order to find the true or apparent obliquity, exclusive of short period terms. This quantity is tabulated on page 214, and is positive or negative according as the true obliquity is greater or less than the mean obliquity.

$\delta''\omega$ = the short period terms of nutation in obliquity, given on pages 231–232.

τ = the fraction of a year intervening between the instant when the Sun's mean longitude was 280° and the date for which λ or ω is required.

Then—

$$\lambda=\lambda'+\tau\psi_1+\delta'\psi+\delta''\psi$$
$$\omega=\omega'-0''.464\,\tau+\delta'\omega+\delta''\omega$$

Page 214 contains, for each fifth Greenwich mean noon throughout the year, certain quantities which may be described in terms of the above notation as follows: The *Precession in Longitude from 1915.0* $=\tau\psi_1$; the *Nutation in Longitude* $=\delta'\psi$; the *Nutation in Right Ascension* $=(\delta'\psi)\cos\omega'$; the *Nutation in Obliquity* $=\delta'\omega$, and the *Obliquity of the Ecliptic* $=\omega-\delta''\omega$, which is the true inclination of the Earth's equator to the ecliptic, exclusive of the terms depending on the Moon's longitude.

PART II.—THE EPHEMERIS FOR THE MERIDIAN OF WASHINGTON.

Pages 216–217 contain formulæ for reducing the positions of fixed stars, including expressions for the Besselian star-numbers and star-constants, and for the independent star-numbers; the whole based upon the constants of the Paris Conference of May, 1896, and expressed in the notation of BESSEL.

Pages 218–221 contain the logarithms of the *Besselian Star-Numbers*, *A*, *B*, *C*, *D*, for each Washington mean midnight, with the values of *E* appended at the bottoms of the pages. The terms of short· period have been included. These numbers serve to reduce the mean place of a star at the beginning of the Besselian fictitious year to its apparent place at the dates for which the numbers are given, and in ordinary cases four-figure logarithms suffice; but where extreme accuracy is desired the logarithms of *A*, *C*, and *D* are sometimes needed to five places of decimals. If used in accordance with the English and French notation, the pair of quantities *A* and *B* must be interchanged with the pair *C* and *D;* that is, *A* must be interchanged with *C*, and *B* with *D*. Along with the solar day, the first column contains the sidereal hour of Washington mean midnight for certain dates, and by interpolation among them it is easy to find the sidereal time for which any set of quantities is given.

The following is an example of the reduction of a star to apparent place by the Besselian star-numbers:

Computation of the apparent place of 2 Aquilæ, July 2, 1915, for the upper transit at Washington.

log a	0.5165	log b	7.2435n	log c	8.0427	log d	8.8236n
log A	9.8629	log B	0.8181n	log C	0.5218	log D	1.3042n
log a'	0.5153	log b'	9.9941	log c'	9.4340	log d'	8.4140n
log Aa	0.3794	log Bb	8.0616	log Cc	8.5645	log Dd	0.1278
log Aa'	0.3782	log Bb'	0.8122n	log Cc'	9.9558	log Dd'	9.7182

		h	m	s		°	′	″
Mean Place, 1915.0	$\alpha_0 =$	18	37	37.244	$\delta_0 =$	−9	8	5.20
	$Aa =$			+ 2.395	$Aa' =$			+2.39
	$Bb =$			+ 0.012	$Bb' =$			−6.49
	$Cc =$			+ 0.037	$Cc' =$			+0.90
	$Dd =$			+ 1.342	$Dd' =$			+0.52
	$E =$			+ 0.002	$\tau\mu' =$			0.00
	$\tau\mu =$			+ 0.001				
Apparent Place, July 2,		18	37	41.033		−9	8	7.88
	$-f' =$			− 0.005				
	$\alpha =$	18	37	41.028				

Pages 222–229 contain the *Independent Star-Numbers*, which can frequently be advantageously used instead of the *Besselian Star-Numbers*. The terms of short period have been included. These quantities are connected with those of Bessel by the relations given on page 216, which also contains the formulæ and precepts for the application of both systems of numbers. In order to use the Besselian numbers, it is necessary to have the values of the star-constants, a, b, c, d, a', b', c', d', while the independent star-numbers render it possible to determine the apparent place of a star without computing these star-constants. Four-figure logarithms usually suffice, but where extreme accuracy is desired the logarithms of g and h are needed to five places of decimals, and G and H are needed to one-tenth of a minute of arc. The column τ gives the fraction of a year, counted from the beginning of the Besselian fictitious year to each date.

The following is an example of the reduction of a star to apparent place by the independent star-numbers:

Computation of the apparent place of 2 Aquilæ, July 2, 1915, for the upper transit at Washington.

$G = 22^{h}\ 23^{m}.1$ $\qquad$ $\delta_0 = -9^{\circ}\ 8'.1$

$\alpha_0 = 18^{h}\ 37^{m}.6$ $\qquad$ $G+\alpha_0 = 17^{h}\ 0^{m}.7$

$H = 11^{h}\ 22^{m}.5$ $\qquad$ $H+\alpha_0 = 6^{h}\ 0^{m}.1$

					h m s
log $\frac{1}{15}$	8.8239	log $\frac{1}{15}$	8.8239	$\alpha_0 =$	18 37 37.244
log g	1.2050	log h	1.3100	$f =$	+ 2.237
sin $(G+\alpha_0)$	9.9853n	sin $(H+\alpha_0)$	0.0000	$(g) =$	+ 0.166
tan δ_0	9.2063n	sec δ_0	0.0055	$(h) =$	+ 1.379
				$\tau u =$	+ 0.001
log (g)	9.2205	log (h)	0.1394		
				$\alpha =$	18 37 41.027
					° ′ ″
log g	1.2050	log h	1.3100	$\delta_0 =$	− 9 8 5.20
cos $(G+\alpha_0)$	9.4078n	cos $(H+\alpha_0)$	6.7648	$(g') =$	−4.10
		sin δ_0	9.2007n	$(h') =$	0.00
log (g')	0.6128n			$(i) =$	+1.42
		log (h')	7.2755n	$\tau\mu' =$	0.00
				$\delta =$	− 9 8 7.88
log i	0.1591				
cos δ_0	9.9945				
log (i)	0.1536				

Page 230 contains for every tenth sidereal day the *Besselian* and *Independent Star-Numbers*, exclusive of all short-period terms. They are useful in computing ephemerides of stars, similar to those on pages 287–486, for which constants containing short-period terms should not be employed.

Pages 231–232 contain for Washington mean midnight of each day the short-period terms of the nutation in longitude and obliquity, for use in connection with the formulæ on page 217, and the coefficients mentioned below, which are given for each star on pages 287–486.

Pages 233–250 contain the mean places of eight hundred and twenty-five stars, for the beginning of the Besselian fictitious year, or, in other words, for the moment when the Sun's mean longitude is 280°. The annual variations are to be considered as the differential coefficients of each coordinate with respect to the time at the beginning of the year.

Pages 251–286 contain the apparent positions of fifteen northern circumpolar stars for every upper transit at Washington. The mean solar time of transit is given in the column *Mean Solar Date*, in order that each transit above and below the pole may be readily identified. Suppose, for example, that the transit of Polaris below the pole on January 26 is to be found, and we wish to know whether it precedes or follows the upper transit of the same date. On page 251 we find that the upper transit occurs January 26.2; the lower transit, therefore, occurs January 26.7. But the lower transit following that of July 1 (page 257) does not take place until July 2.3. Hence the lower transit of July 1 precedes the upper one of the same date. A transit occurring very nearly at noon may also be identified without a computation to ascertain the actual mean date, by simply noting the tenth of a day in the column *Mean Solar Date*.

The secant and tangent of the apparent declination for the 15th of each month and the mean place in right ascension and declination for the beginning of the year are given for each star at the foot of the page.

Pages 287–486 contain, for every tenth upper transit at Washington, the apparent places of 800 stars, being all those given in the list of mean places, except the twenty-five circumpolars. The mean solar date in the left-hand column of each page gives the day and tenth of the transit, so that intermediate transits may be readily identified; and to facilitate interpolation, the differences of each coordinate are given for every ten days.

In connection with the ephemeris of each 10-day star there are given at the foot of the page, (1) the secant and the tangent of the mean of the star's greatest and least apparent declinations during the year, (2) the seconds of the mean place in both right ascension and declination for the beginning of the year, and (3) the coefficients of the short-period terms of the nutation, the use of which is explained on page 217.

Pages 487–510 contain ephemerides of ten southern circumpolar stars in all respects similar to those of northern circumpolar stars on pages 251–286.

Pages 511–517 contain the mean errors for 1920 in both right ascension and declination of the places of the 825 stars on pages 233–250 taken from *Astronomical Papers of the American Ephemeris*, Vol. VIII, Part 2, pages 370–382. They furnish data for estimating approximately the accuracy of the Mean Places of the Stars on pages 233–250.

Pages 518–525 contain the *Apparent Right Ascension* and *Declination* of the Sun, both for Washington mean and apparent noon, and the *Hourly Motion* of the Sun in these coordinates; the *Equation of Time*, the *Semidiameter* of the Sun, and the *Sidereal Time of Semidiameter Passing Meridian*, for Washington apparent noon; and, lastly, the *Sidereal Time of Mean Noon*. The hours and minutes of right ascension and the degrees and minutes of declination are always made the same for both mean and apparent noon. In cases where they really differ, the minute which would have been numerically larger is diminished by one, and the seconds increased by sixty, so that the sum of the two remains correct. The hourly motions in right ascension and declination are given for the columns headed *Mean Noon*, but may be regarded as having the same values for apparent noon.

The *Equation of Time for Apparent Noon* is the correction to be applied to apparent time in order to obtain mean time. It is, therefore, mean time minus apparent time. Each number as given is the mean time of transit of the Sun's center over the meridian of Washington, counted from the nearest noon. The use of all the quantities is substantially the same as in the *Ephemeris for the Meridian of Greenwich*.

Pages 526–541 contain the right ascension, declination, semidiameter, and parallax of the Moon at the moment of upper and lower transit over the meridian of Washington. The mean time given in the third column is that of transit of the Moon's center over this meridian. The differences for one hour of longitude are the amounts by which the local mean times of transit over a meridian one hour west of Washington would exceed those given in the column *Mean Time of Transit*, supposing the rate of change to be uniform and equal to what it is at the instant of transit over the meridian of Washington. The next four columns need no especial explanation, except that the differences for one hour of longitude are computed as if the motion of the Moon in right ascension were uniform, or, in other words, they are differential coefficients corresponding to the instants of Washington transit. By means of them, when second differences are taken into account, the position of the Moon can be computed with great exactness for the moment of transit over any meridian not more than one hour distant from Washington. To obtain the same accuracy for more distant meridians, we may proceed as follows: Let F represent either the *Mean Time of Transit*, the *Right Ascension of Center*, or the *Geocentric Declination of Center*, and let D represent the corresponding *Difference for One Hour of Longitude*. Write down three successive values of F, together with the corresponding values of D, and difference the latter as in the following scheme, where the middle values, F_0 and D_0, belong to the culmination from which is to be derived the value of F for the culmination on the meridian whose longitude is λ:—

Function.	Diff. for 1 Hour of Longitude.	Δ'	Δ''
F_{-1}	D_{-1}		
		a'	
F_0	D_0		b
		a''	
F_{+1}	D_{+1}		

Then, for the culmination at the meridian λ

$$F_\lambda = F_0 + \lambda D_0 + \frac{\lambda^2}{48}(a' + a'') + \frac{\lambda^3 b}{864}$$

where λ must be expressed in hours and decimals of an hour, and reckoned from Washington or from 180° from Washington according as the upper or lower culmination is used for the middle value (F_0). Adding twelve hours to the Washington time of lower transit at Washington gives the local time of upper transit at places whose longitude is 180° from Washington.

The columns of *Sidereal Time of Semidiameter Passing Meridian*, *Geocentric Semidiameter* and *Equatorial Horizontal Parallax* need no explanation, except that they are all given for the moment of transit. The column *Bright Limbs* is given to indicate to the observer which limbs are illuminated. When one limb is full and the terminator is within 1″ of the opposite limb, both can be well observed, and in such cases both are indicated, the defective limb being indicated by an italic letter or numeral, and the correction for defective illumination (as seen from Washington) being given in a foot-note.

Pages 542–558 contain for each of the seven major planets, the geocentric *Apparent Right Ascension* and *Declination*, the *Horizontal Parallax*, *Semidiameter*, and *Sidereal Time of Semidiameter Passing Meridian*, for the moments of all transits which it is usually desirable to observe over the meridian of Washington. The columns following the dates give the Washington mean times of these transits. The stellar magnitude at opposition for Mars, Jupiter, Saturn, Uranus, and Neptune, respectively, is given at the bottom of the page containing the ephemeris of the planet.

PART III.—PHENOMENA.

This part gives the dates of the principal astronomical phenomena of the year, expressed in Washington mean time, except in the case of the eclipses, which are expressed in Greenwich mean time.

Pages 560–564 contain all necessary data respecting the solar eclipses which occur during the year.

The eclipse elements are given for the moment of conjunction of the Sun and Moon in right ascension, but the subsequent tables and results are computed from the exact positions of these bodies at the several instants referred to. The times and angles designated as the circumstances of a lunar eclipse remain the same throughout all parts of the Earth, and require no explanation beyond a mere statement of the fact that in computing them the geometrical diameter of the Earth's shadow has been augmented in the proportion of 51 : 50. The principal circumstances of each total and annular eclipse are stated in five lines, as follows:—

The line entitled "Eclipse begins" gives the Greenwich mean time at which the Moon's penumbra first touches the Earth, together with the latitude and longitude of the point of contact.

The line entitled "Central eclipse begins" gives the time when the axis of the Moon's shadow first touches the Earth, and the latitude and longitude of the point of contact follow.

The line entitled "Central eclipse at local apparent noon" gives the time when the axes of the Earth and of the shadow cone lie in the same plane. The latitude and longitude of the point where the axis of the shadow cone then cuts the Earth's surface follow, and there the eclipse will be central and the Sun will be exactly on the meridian.

The lines entitled "Central eclipse ends" and "Eclipse ends" give, respectively, the times when and the localities where these events occur, the phenomena being the converse of those denoted by the similar phrases for the beginning.

In the case of partial solar eclipses the axis of the Moon's shadow does not come into contact with the Earth, and the three lines entitled, respectively, "Central eclipse begins," "Central eclipse at local apparent noon," and "Central eclipse ends," are replaced by a single line entitled "Greatest eclipse," whereon are given the time when and the latitude and longitude where the eclipse attains its greatest magnitude. The latter phenomenon necessarily occurs with the Sun in the horizon.

Maps of the Eclipses.—The regions in which each eclipse is visible are shown upon the map relating to it, from which may be taken approximately, for any place, both the times of the beginning and ending of the eclipse and its magnitude. The dotted curves show the outline of the shadow for each hour of Greenwich mean time, and therefore pass through all places where the eclipse begins or ends at the hour indicated. To find the instant of beginning at any place, we determine by inspection between what pair of these curved lines the place is situated. The eclipse will then begin between the corresponding hours of Greenwich mean time; and the fraction of the hour may be determined by dividing the hour in the same proportion as the space representing it on the map is divided by the place in question. This division may be made a little more exact by allowing for the changes in the spaces as indicated by their varying width. The Greenwich mean time thus found must be reduced to local mean time by applying the longitude.

As an example, suppose we wish to find the times at which the eclipse of 1915, August 10, begins and ends at a point near Honolulu, latitude 21° 18′ N., longitude 157° 55′ W.

For the beginning we compare the distance of the place from the curves of 9^h and 10^h, and find it to correspond to about 10 minutes from the former, thus giving for the approximate time of beginning 9^h 10^m; for the end we compare the distance of the place from the curves of 12^h and 13^h, and find it to be about 20 minutes from the former, thus giving for the approximate time of ending 12^h 20^m, and both of these results are probably correct to within 3 or 4 minutes.

Changing to local mean time, we shall have—

		Beginning.			*Ending.*		
		d	h	m	d	h	m
Greenwich mean time	August	10	9	10	10	12	20
Longitude west			10	32		10	32
Local mean time	August	9	22	38	10	1	48

In the case of total and annular eclipses, a fair estimate of the magnitude of the eclipse at any place may be obtained from the position thereof relatively to the central line and to the limit. On the central line the eclipse is annular or total, while between the central line and the limit the maximum magnitude of the eclipse is given by the quotient of the distance of the place from the limit divided by the distance of the central line from the limit; the measurements being made upon a line drawn through the place, perpendicularly to the central line.

More Accurate Computations.—A more accurate determination of the phases, as visible at any point of the Earth's surface, may be obtained from the Besselian elements which are given for every 10 minutes of Greenwich mean time. Their geometric signification is as follows:—

Let us imagine a plane passing through the center of the Earth, perpendicular to the right line joining the centers of the Sun and Moon. This latter line is the axis of the Moon's shadow, and the plane is called the *fundamental plane* or plane of xy. We take the intersection of this plane with that of the Earth's equator as the axis of x, and the center of the Earth as the origin of coordinates. The axis of y is perpendicular to that of x, and directed toward the north; x and y are then the coordinates of the point in which the axis of the shadow intersects the fundamental plane, and they are here expressed in terms of the Earth's equatorial radius as unity. The angle d, of which the sine and cosine are both given, is the declination of that point of the celestial sphere toward which the axis of the shadow is directed; or, in other words, it is the declination of the center of the Sun as seen from the center of the Moon. The angle μ is the Greenwich hour-angle of this same point of the celestial sphere.

The quantities l_1 and l_2 are the radii of the shadow cones upon the fundamental plane, l_1 corresponding to the penumbra, and l_2 to the umbra, or annulus. The notation is that of CHAUVENET'S *Spherical and Practical Astronomy*, in which l_2 is regarded as positive for an annular and negative for a total eclipse.

The angles f_1 and f_2, the tangents of which are given, are the angles which the elements of the respective shadow cones make with the axis of the shadow; or, they are the semiangles of the two cones.

In order to facilitate interpolation to any required moment, the logarithms of x', y', and μ', which are the changes of x, y, and μ, in one minute of time, are given at the bottom of the table.

The method of computing an eclipse from its Besselian elements is based on the fact that at the moments of beginning and ending the distance of the observer from the axis of the shadow or penumbra is equal to the radius of the latter at the point of observation. To find this distance and radius we proceed as follows:

(1) The coordinates of the observer, ξ, η, and ζ, together with their variations in one minute, are computed for some assumed moment of Greenwich mean time, as near as practicable to the true time of the required phase.

(2) The coordinates x and y of the axis of the shadow, together with their variations in one minute, are taken for the same moment from the tables of elements.

(3) From (1) and (2) the position and motion of the observer relative to the axis of the shadow are found.

(4) The radius of the penumbra or umbra at a distance from the fundamental plane equal to that of the observer is also computed.

(5) Then, assuming the motions to be uniform, we determine the time required for the observer to be brought to a distance from the axis of the shadow equal to this radius.

The formulæ and directions for the several steps in the computation are as follows:—

(1) Find $\rho \cos \varphi'$ and $\rho \sin \varphi'$, which are the geocentric coordinates of the station referred to the Earth's equator, ρ being the distance from the center of the Earth and φ' the geocentric latitude. These coordinates may be computed from the following table based on the compression of the Earth adopted at the Paris Conference of 1911, 1/297, by the formulæ—

$$\rho \cos \varphi' = F \cos \varphi$$

$$\rho \sin \varphi' = \frac{\sin \varphi}{G}$$

φ being, as usual, the geographic latitude.

Table for Computing the Geocentric Coordinates of a Place.

φ	Log F.		Log G.	
0°	0.00000	1	0.00293	1
5	0.00001	3	0.00292	3
10	0.00004	6	0.00289	6
15	0.00010	7	0.00283	7
20	0.00017	9	0.00276	9
25	0.00026	11	0.00267	11
30	0.00037	11	0.00256	11
35	0.00048	12	0.00245	13
40	0.00060	13	0.00232	12
45	0.00073	13	0.00220	13
50	0.00086	12	0.00207	12
55	0.00098	12	0.00195	12
60	0.00110	10	0.00183	10
65	0.00120	9	0.00173	9
70	0.00129	8	0.00164	8
75	0.00137	5	0.00156	5
80	0.00142	3	0.00151	3
85	0.00145	1	0.00148	2
90	0.00146		0.00146	

For the assumed Greenwich mean time of computation, take from the table of elements the values of sin d, cos d, and μ. Then, with λ for the longitude west from Greenwich, the coordinates of the observer will be—

$$\xi = \rho \cos \varphi' \sin (\mu - \lambda)$$
$$\eta = \rho \sin \varphi' \cos d - \rho \cos \varphi' \sin d \cos (\mu - \lambda) = \eta_1 - \eta_2$$
$$\zeta = \rho \sin \varphi' \sin d + \rho \cos \varphi' \cos d \cos (\mu - \lambda) = \zeta_1 + \zeta_2$$

and their variations in one minute of mean time will be—

$$\xi' = [7.63992]\, \rho \cos \varphi' \cos (\mu - \lambda)$$
$$\eta' = [7.63992]\, \rho \cos \varphi' \sin d \sin (\mu - \lambda) = [7.63992]\, \xi \sin d$$

ζ' is not needed.

(2) For the same assumed moment of Greenwich mean time, take from the tables of elements the coordinates x and y of the axis of the shadow, together with their variations for one minute, which are equal to one-tenth of the differences of two consecutive numbers. These variations are represented by x' and y', and their logarithms are given beneath the tables of x and y.

(3) The distance m and position-angle M of the axis of the shadow relatively to the observer, and the relative motions, n and N, are computed by the formulæ—

$$m \sin M = x - \xi$$
$$m \cos M = y - \eta$$
$$n \sin N = x' - \xi'$$
$$n \cos N = y' - \eta'$$

(4) Both for the shadow and for the penumbra, the radius L at the distance ζ from the fundamental plane is computed by the formula—

$$L = l - \zeta \tan f$$

l and f being found from the table of elements, and ζ computed in (1).

(5) If the time chosen for computation is exactly that of the beginning or ending of the eclipse, we shall have—

$$m = L$$

But, as this condition will rarely be fulfilled on a first trial, a correction τ to the assumed time is computed thus: Find the angle ψ from the equation,

$$\sin \psi = \frac{m \sin (M-N)}{L}$$

There will be two values for this angle, of which one will be in the first and the other in the second quadrant when $\sin \psi$ is positive, and one in the third and the other in the fourth quadrant when $\sin \psi$ is negative; but simplicity will be gained by taking only that value of ψ for which $\cos \psi$ is positive. This value lies between the limits $+90°$ and $-90°$. The correction τ to the assumed time of beginning or ending of the eclipse will then be found, in minutes, from—

$$\tau = -\frac{m \cos (M-N)}{n} \mp \frac{L \cos \psi}{n}$$

where the double sign is to be taken negative for the beginning and positive for the ending.

However, one such pair of values of τ can not give the times of both beginning and ending with accuracy. To attain that, we must commence the computation by assuming two times, one near the beginning and the other near the ending of the eclipse, both of which may be derived from the chart with sufficient exactness. The computation for the first assumed time will give a small value of τ which, when applied to the assumed time, will give the beginning of the eclipse nearly correctly, and a large value which will give an inaccurate time of ending. Similarly the computation for the second assumed time will give a small and nearly correct value of τ for finding the time of ending, and a large and inaccurate negative value for finding the time of beginning. We shall thus deduce two times of each phase, only one of which is to be regarded as approximately correct.

The more accurate times of beginning and ending may now be taken in place of those originally assumed, and the whole computation may be repeated, thus leading to a pair of values of τ, which should be very small and accurate. Such a repetition of the computation will in general be advisable, to guard against accidental numerical errors, but a second approximation may be obtained without it, by finding a corrected value of τ in accordance with the formulæ—

$$\delta\tau = \mp \frac{\tau(l' + [5.3100]\xi \cos d)}{n \cos \psi} - \frac{[4.9788]\tau^2}{n \cos \psi}[\xi \sin (N \mp \psi) - \eta_2 \cos (N \mp \psi)]$$

$$\tau_0 = \tau + \delta\tau$$

where the double signs are to be taken negative for the beginning of the eclipse and positive for the ending. l' is the variation of l for one minute of time, and its numerical value can be taken by inspection from the table of Besselian elements.

If the resulting values of τ_0 are not greater than fifteen minutes, the corrected times of contact thus obtained will be theoretically exact within less than a second, but the uncertainties of the solar and lunar tables are such that an unavoidable error of several seconds may exist in the prediction. To guard against numerical mistakes it is better, after making this final correction, to repeat the computations so far as to obtain new values of m and L for the corrected times. If these two quantities agree within a unit of the fourth place of decimals, the times employed are generally correct within a second of time. If they differ too widely, the computer must use his own judgment as to making further corrections and computations.

Position-angle of Point of Contact.—The position-angle P, of the point of contact, reckoned from the north point of the Sun's limb toward the east, is found by the formulæ—

$$P = N - \psi \pm 180^\circ \text{ for the beginning,}$$
$$\text{or} \quad P = N + \psi \quad \text{for the ending,}$$

it being assumed that, in each case, the value of ψ is taken between the limits $\pm 90^\circ$.

Computation of the Solar Eclipse of 1915, August 10, for a point near Honolulu.

The position of the point chosen is—

	°	′	″
Latitude, $\varphi = +$	21	18	0
Longitude, $\lambda = +$	157	55	0

Its geocentric coordinates are—

$$\rho \sin \varphi' = 9.55747$$
$$\rho \cos \varphi' = 9.96946$$

From the Eclipse Chart we find the approximate times of the phases to be—

	d	h	m	
Beginning August	10	9	10	Greenwich Mean Time.
Ending	10	12	20	

	Beginning.	Ending.
Greenwich Mean Time, T, August 10,	$9^h\ 10^m$	$12^h\ 20^m$
	° ′ ″	° ′ ″
μ	136 10 24	183 40 54
λ	+157 55 0	+157 55 0
$\mu - \lambda$	− 21 44 36	+ 25 45 54
$\rho \cos \varphi'$	9.96946	9.96946
$\sin (\mu - \lambda)$	9.56873 *n*	9.63817
$\log \xi$	9.53819 *n*	9.60763
ξ	−0.34529	+0.40516
$\rho \sin \varphi'$	9.55747	9.55747
$\cos d$	9.98347	9.98355
$\log \eta_1$	9.54094	9.54102
η_1	+0.34749	+0.34755
$\rho \cos \varphi'$	9.96946	9.96946
$\sin d$	9.43254	9.43154
$\cos (\mu - \lambda)$	9.96795	9.95453
$\log \eta_2$	9.36995	9.35553
η_2	+0.23439	+0.22674
$\eta = \eta_1 - \eta_2$	+0.11310	+0.12080
$\rho \sin \varphi' \sin d$	8.99001	8.98901
ζ_1	+0.09773	+0.09750
$\rho \cos \varphi' \cos d \cos (\mu - \lambda)$	9.92088	9.90754
ζ_2	+0.83345	+0.80824
$\zeta = \zeta_1 + \zeta_2$	+0.93118	+0.90574
const. log	7.63992	7.63992
$\rho \cos \varphi' \cos (\mu - \lambda)$	9.93741	9.92399
$\log \xi'$	7.57733	7.56391

	Beginning.	Ending
ξ'	+0.003779	+0.003664
const. log	7.63992	7.63992
$\xi \sin d$	8.97073 *n*	9.03917
$\log \eta'$	6.61065 *n*	6.67909
η'	−0.000408	+0.000478
$x-\xi$	−0.47834	+0.31098
$y-\eta$	+0.25541	−0.41735
$x'-\xi'$	+0.004325	+0.004437
$y'-\eta'$	−0.003087	−0.00398
$m \sin M$	9.67974 *n*	9.49273
$m \cos M$	9.40724	9.62050 *n*
$\tan M$	0.27250 *n*	9.87223 *n*
M	− 61° 54′ 0″	+143° 18′ 33″
$\sin M$	9.94553 *n*	9.77634
$\log m$	9.73421	9.71639
$n \sin N$	7.63599	7.64709
$n \cos N$	7.48954 *n*	7.60021 *n*
$\tan N$	0.14645 *n*	0.04688 *n*
N	+125° 31′ 2″	+131° 54′ 48″
$\sin N$	9.91060	9.87166
$\log n$	7.72539	7.77543
$\tan f$	7.66403	7.66404
$\log \zeta$	9.96903	9.95700
	7.63306	7.62104
$\zeta \tan f$	+0.00430	+0.00418
l	+0.55479	+0.55445
L	+0.55049	+0.55027
$M-N$	−187° 25′ 2″	+ 11° 23′ 45″
$\sin (M-N)$	9.11090	9.29576
$\log m$	9.73421	9.71639
colog L	0.25925	0.25942
$\sin \psi$	9.10436	9.27157
ψ	+ 7° 18′ 21″	+ 10° 46′ 16″
$\log \frac{m}{n}$	2.00882	1.94096
$\cos (M-N)$	9.99635 *n*	9.99136
	2.00517 *n*	1.93232
$-\frac{m}{n} \cos (M-N)$	+101.198	−85.570
$\log L$	9.74075	9.74058
$\cos \psi$	9.99646	9.99228
colog n	2.27461	2.22457
	2.01182	1.95743

	Beginning.	Ending.
$\mp\frac{L\cos\psi}{n}$	−102.760	+90.662
	m	m
τ	− 1.562	+ 5.092
	d h m	d h m
$T+\tau$	10 9 8.438	10 12 25.092

Since the value of τ for the ending is rather large, we compute the correction $\delta\tau$ for this phase as follows:

	Ending.
const. log	5.3100
log ξ	9.6076
cos d	9.9836
	4.9012
number	+0.0000080
l'	−0.0000023
sum	+0.0000057
log (sum)	4.7559
log τ	0.7069
colog n	2.2246
sec ψ	0.0077
	7.6951
(1)	+0.0050
$N+\psi$	142° 41′
sin $(N+\psi)$	9.7826
log ξ	9.6076
log ξ sin $(N+\psi)$	9.3902

	Ending.
cos $(N+\psi)$	9.9005 n
log η_2	9.3555
log η_2 cos $(N+\psi)$	9.2560 n
ξ sin $(N+\psi)$	+0.2456
η_2 cos $(N+\psi)$	−0.1803
diff.	+0.4259
log (diff.)	9.6293
const. log	4.9788 n
log τ^2	1.4138
colog (n cos ψ)	2.2323
	8.2542 n
(2)	−0.0180
	m
$(1)+(2)=\delta\tau$	−0.013
τ	+5.092
τ_0	+5.079

The corrected time of ending is, therefore,

$$T_0 = \text{August } 10^{d}\ 12^{h}\ 25^{m}.079$$

Whence we find—

		Beginning.	Ending.
		d h m	d h m
Greenwich Mean Time,	August	10 9 8.438	10 12 25.079
λ		+ 10 31.667	+ 10 31.667
Local Mean Time,	August	9 22 36.771	10 1 53.412

Therefore we have—

	d h m s	
Beginning of the Eclipse, August	9 22 36 46.3	Local Mean Time.
End of the Eclipse, August	10 1 53 24.7	

	Beginning.	Ending.
	° ′	° ′
$N\mp\psi$	118 12.7	142 41.1
constant	180 0.0	0 0.0
Angle of position: P	298 12.7	142 41.1

from the north point of the Sun's disk toward the east for direct image.

Pages 565–569 contain the adopted mean places and annual proper motions of such stars as bright as magnitude 6.5 as will be occulted during the year by the Moon.

Pages 570–608 contain the elements for the prediction of the times of occultations of stars and planets by the Moon during the current year. The system of coordinates employed is similar to that already described for eclipses, the fundamental plane passing through the center of the Earth, and being taken perpendicular to the line joining the star and the center of the Moon, but the cone circumscribing the Moon and star is regarded as a cylinder which intercepts the fundamental plane in a circle having the same linear diameter as the Moon.

In the columns referring to the star, those headed *Red'ns from 1915.0* give the quantities necessary to reduce the mean place of the star at the beginning of 1915 to its apparent place at the time of occultation. These reductions are sufficiently accurate to be definitive.

Under the general head, *At Conjunction in R. A.*, are five columns giving certain quantities for the moment of geocentric conjunction of the Moon and star in right ascension, as follows:

The *Washington Mean Time* is the moment, T, at which the two bodies are in geocentric conjunction in right ascension. At that moment the coordinate x of the axis of the cylinder on the fundamental plane has the value zero. The column *Hour Angle*, H, gives the common geocentric hour-angle of the Moon and star at the same moment, expressed in sidereal time and counted from the meridian of Washington—positive toward the west and negative toward the east. Column Y gives the coordinate y of the axis of the cylinder upon the fundamental plane at the same moment. Columns x' and y' give the variations of x and y in one hour of mean time. The linear unit in these columns is the Earth's equatorial radius. The limiting parallels, north and south, show the extreme limits of latitude within which the occultation will be visible.

By the aid of these elements, the Washington mean time of immersion and emersion of a star relatively to the limb of the Moon may be computed for any part of the Earth by a method nearly the same as that already explained for computing eclipses, but somewhat more simple.

Prediction of Occultations for a given Place.—When it is desired to predict the circumstances of one or more occultations at any place, the first step will be to select them from the general list given in the Ephemeris. The conditions of visibility are:—

1. The limiting parallels in the last columns must include the latitude of the place.

2. The quantity $H-\lambda$, taken without regard to sign, must be less than the semidiurnal arc of the star by at least one hour. On very rare occasions an emersion might be seen in the east, or an immersion in the west, when this difference is a few minutes less than an hour.

3. The Sun must not be much more than an hour above the horizon at the local mean time $T-\lambda$, unless the star is bright enough to be seen in the daytime.

When many occultations are to be selected, the most convenient course will be to write the value of $-\lambda$ on the bottom of a slip of paper, and in passing through the list of occultations to pause over each one for which condition (1) is fulfilled, and examine by means of the slip whether conditions (2) and (3) are also fulfilled. If either fails, the computer passes on. Sometimes it will be difficult to determine whether $H-\lambda$ or $T-\lambda$ falls within the limits; and in such cases the computer may mark the occultation for trial and leave the decision for the subsequent operations. The whole list can be gone over in less than a day, and it will probably be found that about one-tenth of the occultations are marked for trial.

The next step will be to compute the local times of immersion and emersion from the elements, and to that end let—

T = the instant of geocentric conjunction of Moon and star in right ascension, expressed in Washington mean solar time;
H = the Washington west hour-angle of the two bodies at that moment;
λ = the longitude west of Washington;
$h_0 = H - \lambda$ = the local hour-angle of the star at the instant T;
δ = the star's declination.

The procedure for each occultation will then be as follows:—

(1) The geocentric coordinates of the place, $\rho \sin \varphi'$ and $\rho \cos \varphi'$, are to be computed by the formulæ and table given in connection with eclipses on page 716.

The next step will be to find the approximate instant of apparent conjunction of the Moon and star as seen from the place, and that may be deduced from the time of geocentric conjunction by the application of an approximate correction taken from DOWNES's table, printed in the volumes of the American Ephemeris for 1882 to 1899. This correction must be reckoned in mean solar hours, and will be designated by the symbol t. It will have the same sign as h_0.

When DOWNES's table is not available, the correction may be computed from the formulæ,

$$\xi_0 = \rho \cos \varphi' \sin h_0$$

$$\xi' = [9.4192]\ \rho \cos \varphi' \cos\frac{4}{3}h_0$$

$$t = \frac{\xi_0}{x' - \xi'}$$

By applying t to the Washington mean time of geocentric conjunction, as given with the elements, we shall have the Washington mean time of local conjunction within a few minutes.

(2) Compute for the instant $T+t$ the following quantities, in which t_0 is the sidereal equivalent of the mean time interval t:

$$\begin{aligned}
\xi &= \rho \cos \varphi' \sin (h_0 + t_0) \\
\eta &= \rho \sin \varphi' \cos \delta - \rho \cos \varphi' \sin \delta\ \mathrm{oos}\ (h_0 + t_0) = \eta_1 - \eta_2 \\
\xi' &= [9.4192]\ \rho \cos \varphi' \cos (h_0 + t_0) \\
\eta' &= [9.4192]\ \rho \cos \varphi' \sin \delta \sin (h_0 + t_0) = [9.4192]\ \xi \sin \delta \\
x &= x't \\
y &= Y + y't.
\end{aligned}$$

Compute also m, M, n, N, and ψ from the equations,

$$\begin{aligned}
m \sin M &= x - \xi \\
m \cos M &= y - \eta \\
n \sin N &= x' - \xi' \\
n \cos N &= y' - \eta' \\
\sin \psi &= [0.5646]\ m \sin (M - N)
\end{aligned}$$

ψ being taken between the limits ±90°. Finally compute,

$$\tau = -\frac{[1.7782]m}{n}\cos(M-N) \mp \frac{[1.2135]}{n}\cos\psi$$

$$\delta\tau = \frac{[6.7591]\tau^2}{n\cos\psi}[\eta_2\cos(N\mp\psi) - \xi\sin(N\mp\psi)]$$

where the double signs are to be taken negative for an immersion and positive for an emersion. Both τ and $\delta\tau$ thus have two values, which are expressed in minutes of time, and in order to distinguish them let those pertaining to immersion be designated respectively τ' and $\delta\tau'$, while those pertaining to emersion are designated τ'' and $\delta\tau''$. We then have for the Washington mean times of the phases,

$$\text{Instant of immersion} = T + t + \tau' + \delta\tau'$$
$$\text{Instant of emersion} = T + t + \tau'' + \delta\tau''$$

These expressions are practically exact, as the corrections $\delta\tau$ seldom amount to so much as 1.5 minutes, and whenever an inaccuracy of that magnitude is permissible they may be omitted. As a check upon the results, it will be advisable to compute ξ, η, x, and y for the times of immersion and emersion finally obtained. If these times are correct the quantities in question will fulfill the condition,

$$\sqrt{(x-\xi)^2 + (y-\eta)^2} = 0.2725$$

If log m sin $(M-N) > 9.4354$, sin ψ will be numerically greater than unity, and no occultation is to be expected at the given place; but a very brief one may occur if the excess of the computed distance over the Moon's semidiameter happens to be within the errors of the ephemerides of the Moon and star.

The position-angle of the line from the Moon's center to the star, at the time of contact, is reckoned from the north point toward the east, and designated by the symbol P. It is computed from the formulæ,

$$P = N - \psi + \delta P \qquad \text{for immersion,}$$
$$\text{or} \qquad P = N + \psi + \delta P \pm 180° \text{ for emersion,}$$

where the angles $N-\psi$ and $N+\psi$ are taken directly from the computation of $\delta\tau$, and δP is found in degrees of arc from the expression,

$$\delta P = \mp\frac{[7.3038]\tau^2}{\cos\psi}[\eta_2\sin N + \xi\cos N]$$

In the latter formula the double sign is to be taken negative for an immersion and positive for an emersion.

The angle from the vertex, V, is also reckoned in the direction from the north toward the east, and is found from the formula,

$$V = P - C$$

where C is computed from the expression,

$$\tan C = \frac{\xi + [8.2218]\tau\xi' - [4.9810]\tau^2\xi}{\eta + [8.2218]\tau\eta' + [4.9810]\tau^2\eta_2}$$

C being taken less or greater than 180°, according as the numerator is positive or negative.

The value of τ employed in the latter formula must be so taken as to correspond with the phase for which C is required.

In the volumes of the American Ephemeris for the years 1882 to 1901 instructions are given for constructing three special tables which greatly diminish the abor of computing occultations, but as these tables should contain from 4700 to 5300 quantities, and as they would apply only to the place for which they were computed, it will rarely be worth while to undertake the labor of forming them. Those who desire further information on the subject may consult any one of the volumes in question.

As an example of an isolated occultation, we will compute that of 38 B. Sagittarii on March 8, 1915, for New Haven, whose position is—

$$\varphi = +41^\circ\ 19'\ 22''.3$$
$$\lambda = -\ 0^h\ 16^m\ 35^s.2$$

and whose geocentric coordinates are—

$$\rho \sin \varphi' = 9.8174$$
$$\rho \cos \varphi' = 9.8763$$

From the elements on page 584 we have,

$$T = \overset{h}{18}\ \overset{m}{53.1}$$
$$H = -\ 0\ \ 5.2$$

and $h_0 = H - \lambda = +\ 0\ \ 11.4$

From the formulæ on page 723, we find the correction, t, to the Washington mean time of geocentric conjunction, T, to be about $+0^h\ 5^m.7$; therefore the Washington mean time of apparent conjunction is—

$$T + t = \text{March } 8^d\ 18^h\ 58^m.8$$

38 B. Sagittarii.	Apparent Declination. ° ′	W. T. of ☌ d h m	Hour Angle. h m	Y'	x'	y'
	−28 28.1	Mar. 8 18 53.1	− 0 5.2	+0.6871	0.5903	+0.0332

$T+t$ Mar.	$8^d\ 18^h\ 58^m.8$
h_0	+0 11.4
t_0	+0 5.7
h_0+t_0	+0 17.1
$\rho \cos \varphi'$	9.8763
$\sin (h_0+t_0)$	8.8724
$\log \xi$	8.7487
ξ	0.0561
$\rho \sin \varphi'$	9.8174
$\cos \delta$	9.9440
$\log \eta_1$	9.7614
η_1	+0.5773
$\rho \cos \varphi'$	9.8763
$\sin \delta$	9.6782 n
$\cos (h_0+t_0)$	9.9988
$\log \eta_2$	9.5533 n

η_2	−0.3575
$\eta_1-\eta_2=\eta$	+0.9348
const. log	9.4192
$\rho \cos \varphi' \cos (h_0+t_0)$	9.8751
$\log \xi'$	9.2943
ξ'	+0.1969
const. log	9.4192
$\xi \sin \delta$	8.4269 n
$\log \eta'$	7.8461 n
η'	−0.0070
$\log x'$	9.7711
$\log t$	8.9781
$\log x$	8.7492
x	+0.0561
$\log y'$	8.5211
$\log y't$	7.4992

$T+t$ Mar.	8^d 18^h $58^m.8$
$y't$	$+0.0032$
Y	$+0.6871$
y	$+0.6903$
$x-\xi$	0.0000
$y-\eta$	-0.2445
$x'-\xi'$	$+0.3934$
$y'-\eta'$	$+0.0402$
$m \sin M$	——
$m \cos M$	$9.3883\,n$
$\tan M$	——
M	180° 0′
$\cos M$	$0.0000\,n$
$\log m$	9.3883
$n \sin N$	9.5948
$n \cos N$	8.6042
$\tan N$	0.9906
N	84° 10′
$\sin N$	9.9977
$\log n$	9.5971

const. log	0.5646
$\log m$	9.3883
$\sin(M-N)$	9.9977
$\sin\psi$	9.9506
ψ	63° 11′
const. log	1.7782
$\log \frac{m}{n}$	9.7912
$\cos(M-N)$	$9.0070\,n$
	$0.5764\,n$
$-\frac{[1.7782]m}{n}\cos(M-N)$	$+3.77$
const. log	1.2135
colog n	0.4029
$\cos\psi$	9.6543
	1.2707
$\mp\frac{[1.2135]\cos\psi}{n}$	∓ 18.65
	m
τ for immersion	-14.88
τ for emersion	$+22.42$

The computation of $\delta\tau$ for the two contacts is as follows:

	Immersion.	Emersion.
$N\mp\psi$	20° 59′	147° 21′
$\cos(N\mp\psi)$	9.9702	$9.9253\,n$
$\log\eta_2$	$9.5533\,n$	$9.5533\,n$
$\log(1)$	$9.5235\,n$	9.4786
(1)	-0.3338	$+0.3010$
$\sin(N\mp\psi)$	9.5540	9.7320
$\log\xi$	8.7487	8.7487
$\log(2)$	8.3027	8.4807
(2)	$+0.0201$	$+0.0302$
$(1)-(2)$	-0.3539	$+0.2708$
$\log[(1)-(2)]$	$9.5489\,n$	9.4326
const. log	6.7591	6.7591
$\log\tau^2$	2.3452	2.7012
colog $(n\cos\psi)$	0.7486	0.7486
$\log\delta\tau$	$9.4018\,n$	9.6415
	m	m
$\delta\tau$	− 0.25	+ 0.44
$\tau+\delta\tau$	− 15.13	+ 22.86
	d h m	h m
$T+t$	Mar. 8 18 58.8	18 58.8
Washington Mean Time of Phase,	" 8 18 43.7	19 21.7
λ	−0 16.6	− 0 16.6
New Haven Mean Time	Mar. 8 19 0.3	19 38.3

To find δP and P:

$\log \eta_2$	9.5533 *n*	$\log \xi$	8.7487	(3) − 0.3556
$\sin N$	9.9977	$\cos N$	9.0071	(4) + 0.0057
log (3)	9.5510 *n*	log (4)	7.7558	(3) + (4) − 0.3499

	Immersion.	Emersion.
log [(3) + (4)]	9.5439 *n*	9.5439 *n*
const. log	7.3038 *n*	7.3038
$\log \tau^2$	2.3452	2.7012
colog $\cos \psi$	0.3457	0.3457
$\log \delta P$	9.5386	9.8946 *n*
	°	°
δP	+ 0.3	− 0.8
$N \mp \psi$	21.0	147.4
constant	0.0	180.0
Angle of position: P	21.3	326.6

from the north point of the Moon's limb toward the east, for direct image.

Pages 609–610 contain in detail all the data necessary for observing every occultation of the general list which is visible at Washington during the current year.

Page 611 contains the *Ephemeris for Physical Observations of the Sun.*

Pages 612–619 contain the *Ephemeris for Physical Observations of the Moon.* The selenographic longitudes are measured in the plane of the Moon's equator, the axis of reference being the radius of the Moon which passes through the mean center of the visible disk, positive toward the west—i. e., toward Mare Crisium—and the latitudes are measured from the Moon's equator, positive toward the north—i. e., in the hemisphere containing Mare Serenitatis.

The optical and physical librations in longitude and latitude have been computed with elements and formulæ given on page xi, and their sums are given in the second and third columns, respectively, the physical libration being given separately in the fourth and fifth columns. The Sun's selenographic colongitude (90° − longitude) and latitude and the position-angle of the Moon's axis, C, in the sixth, seventh, and eighth columns, respectively, have all been corrected for the effect of physical libration.

When the libration in longitude is positive, the mean center of the disk is displaced toward the east—that is, the region thus exposed to view is on the west limb—and when the libration in latitude is positive the mean center of the disk is displaced toward the south—that is, the region thus exposed to view is on the north limb.

The altitude of the Sun, A, at any given time above the horizon of any point on the Moon whose selenographic longitude and latitude, λ and β, are known, may be computed from the following formula, the Sun's selenographic longitude and latitude being denoted by $l_\odot$ and $b_\odot$, respectively:

$$\sin A = \sin b_\odot \sin \beta + \cos b_\odot \cos \beta \cos (l_\odot - \lambda)$$

Pages 620–621 contain the data with reference to the illuminated disks of Mercury and Venus. The angle θ is the angle which the arc of the great circle from the planet to the Sun makes with the arc from the planet toward the west, measured in the direction west, north, east, south. It is measured from 0° to 360°. We may also regard θ as expressing the angle which the line of cusps makes with the meridian, the positive direction of the meridian being toward the north, and the positive direction of the line of cusps that in which a person following this line would have the illuminated portion of the disk on his right.

Pages 622–625 contain the *Ephemeris for Physical Observations of Mars.* The quantities here given have been corrected for aberration, so that in using them they should be interpolated to the actual time of observation.

P is the position-angle of the axis of rotation measured eastward from the north point of the disk.

$A_\oplus$ and $A_\odot$ are the planetocentric right ascensions of the Earth and Sun, respectively, measured in the plane of the planet's equator from its vernal equinox.

$D_\oplus$ and $D_\odot$ are the planetocentric declinations of the Earth and Sun, respectively, referred to the planet's equator.

$\odot$ ♂ is the planetocentric longitude of the Sun measured in the plane of the planet's orbit from its vernal equinox.

k is the ratio of the area of the illuminated portion of the apparent disk to the area of the entire apparent disk regarded as circular.

i is the angle between the Sun and the Earth as seen from the planet.

q is the angular value of the greatest defect of illumination as seen from the Earth.

Q is the position-angle of the radius of the disk which passes through the point of greatest defect of illumination—that is, of the radius perpendicular to the line joining the cusps. It is measured eastward from the north point of the disk.

The column headed *Central Meridian* contains the longitude of the meridian which bisects the disk, measured from the adopted zero meridian.

The columns headed *Transit of Zero Meridian* contain the Washington Mean Time of every transit of the zero meridian across the actual center of the disk.

Pages 626–629 contain the *Ephemeris for Physical Observations of Jupiter.*

The columns headed *Central Meridian* contain the longitudes of the meridian which bisects the disk, measured from the adopted zero meridian of System I and System II, respectively.

The column headed *Correction for Phase* contains the corrections to be applied to the longitudes of the central meridian to obtain the longitudes of the meridian bisecting the illuminated disk.

The column headed *Transit of Zero Meridian* contains the Washington Mean Time of every fifth transit of the zero meridian across the center of the illuminated disk.

The quantities in the remaining columns on pages 626–627 are the same as those defined under the *Ephemeris for the Physical Observations of Mars.*

Pages 630–655 contain, concerning the *Satellites of Jupiter,* the times of conjunction of Satellites I–IV, the times of elongation of Satellite V, the differences in right ascension and declination between Jupiter and Satellites VI and VII, and the phenomena of the Satellites I–IV together with their configurations.

Page 656 contains the *Magnitude of Saturn* and the *Elements of the Rings.*

Pages 657–663 contain, concerning the *Satellites of Saturn,* the diagram of the orbits of the seven inner satellites, the times of elongation for the first eight satellites, the differences in right ascension and declination between Saturn and Phœbe, the ninth satellite, and tables for predicting the position-angles and distances from the center of the planet of the first eight satellites.

Page 664 contains the diagram of the orbits of the satellites of Uranus, together with the times of their elongations.

Pages 665–666 contain tables for predicting the position-angles and distances from the center of the planet of the satellites of Uranus and Neptune.

Page 667 contains the diagram of the orbit of the satellite of Neptune, together with the times of its elongations.

Pages 668–669 contain the *Phenomena*. The predicted times of the conjunctions, quadratures, and oppositions of the planets with respect to the Sun are, respectively, the instants when the longitude of each planet differs from that of the Sun by 0°, ±90°, or 180°. For the conjunction of the planets with the Moon and with each other the predicted times are the instants when the two bodies have the same right ascension. The degrees and minutes to the right show the difference of declination at the moment of conjunction.

Pages 670–679 contain the *Positions of Observatories*. These have been compiled from various sources, and the data used are the best immediately available. The tabular arrangement is self-explanatory.

Page 680 contains two examples in the computation of lunar distances, which are inserted because the lunar distance tables have been omitted from the American Ephemeris since 1911.

Pages 681–699 contain a series of tables numbered from I to VI.

Table I—*For Finding the Latitude by an Observed Altitude of Polaris.*

Table II—For converting *Sidereal into Mean Solar Time.*

Table III—For converting *Mean Solar into Sidereal Time.*

Table IV—For Finding the *Azimuth of Polaris at All Hour Angles.*

Table V—For Finding the *Azimuth of Polaris at Elongation.*

Table VI—*For Finding the Times of Upper and Lower Culmination of Polaris.*

The following-named persons were engaged in the preparation of the American Ephemeris and Nautical Almanac for the year 1915:

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